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New BSN Nurse Informatics Competencies: Perceptions of Academic Preparedness for Practice

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New BSN Nurse Informatics Competencies: Perceptions of
Academic Preparedness for Practice

New BSN Nurse Informatics Competencies: Perceptions of
Academic Preparedness for Practice

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Education in Higher Education

by

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Abstract

One of the major concerns in the academic preparation of registered nurses (RN) is insuring that when they complete their Baccalaureate of Science in Nursing (BSN) degree requirements they enter practice and are able to provide safe and quality patient care. This mixed methods study (Phase I quantitative and Phase II qualitative) investigated the perceptions of BSN nursing graduates regarding their academic preparedness to meet the Quality and Safety Education of Nurses (QSEN) informatics competencies as the students transitioned into practice. The study further examined the participants' perceptions of the importance of QSEN informatics competencies in practice.

One rapidly expanding nursing program at a public research university in the mid-south region of the United States served as the site for this study. Recent nurse graduates were selected in a purposeful sampling from alumni who had conferred degrees from May 2007 through May 2013. Sixty-three graduates completed the online survey in Phase I and five recent graduates participated in semi-structured interviews during Phase II of the study. Data were collected utilizing a mixed methods design. Descriptive statistics explained survey and interview results. Of the knowledge, skills, and attitudes (KSAs), attitude competencies reported the highest means and were very effective at providing informatics attitude competencies to graduates. The program was also reported being somewhat effective at providing skills competencies and included navigating and documenting in the electronic medical record. The most desired skills reported by participants to include as more curriculum focus were electronic medical record (EMR) navigation, hands-on experience with different technology systems, and documentation, charting, and nurses' notes with legal implications. The top comparable competencies introduced at the new nurse orientation were facility specific navigation of the EMR and computer documentation. Findings in this study served to provide additional knowledge to

existing literature about competency preparedness and transition into practice. Results of this inquiry also served to provide direction for future curriculum planning involving QSEN informatics competencies at the nursing program.

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Chapter I

Introduction

Society's perception of new nurse preparedness for practice has drawn national awareness for concerns of patient safety and quality of care (Durham & Alden, 2008). An Institute of Medicine (IOM) report, "To Err is Human" (Kohn, Corrigan, & Donaldson, 2000), revealed the current condition of safety in healthcare with a plan to avoid future preventable medical errors. The report included an estimated 44,000 to 98,000 patient deaths that could have been prevented annually in hospital settings during the late 1990s (p. 26). IOM proposed a comprehensive plan with a goal to reduce medical errors by 50% within a five-year period (p. 70). The report also generated follow-up safety initiatives that focus on competencies for healthcare professions. The Institute of Medicine (IOM) outlined five proficiency areas that included patient-centered care, working in an interdisciplinary team, evidence-based medicine, quality improvement, and information technology use (Greiner & Knebel, 2003, pp. 45-46) to improve the quality and safety of care. While all five areas were of concern to the IOM, one competency area, information technology use (informatics) plays a major role in the quality and safety of patient care.

In 2006, the Technology Informatics Guiding Education Reform (TIGER) Initiative was founded. Stakeholders met to identify ways to integrate informatics into nursing practice and education through development of a three-year plan. Nursing curriculum changes were recommended that would maximize nursing education exposure to current practice technologies through development of strategy and goals identified by national nursing educators and stakeholders (TIGER, 2014). As TIGER was instituting focus on informatics in nursing education, another healthcare quality and safety patient care initiative was started under the

commitment and direction of the IOM funded by the Robert Wood Johnson Foundation (RWJ). This new initiative, the Quality and Safety Education for Nurses (QSEN) was launched in 2005. QSEN identified six competencies that are based on knowledge, skills, and attitudes for pre-nursing licensure including: (a) patient-centered care, (b) teamwork and collaboration, (c) evidence-based practice, (d) quality improvement, (e) safety, and (f) informatics (QSEN, Project Overview, 2014). The purpose of QSEN was to offer guidance to nursing programs and to recommend the integration of the six competencies into nursing curriculum in order to provide safe, quality care upon entering practice. As baccalaureate-prepared nurses enter practice, the issues of safety and quality of practice are key concerns not only for new employers but also for new nurses (American Association for College of Nursing [AACN]; QSEN, 2014).

Nursing programs are responsible for providing the public with a safe and knowledgeable nurse. Readiness for clinical practice involves many years of academic preparation in both the classroom and clinical setting (Heller, Oros, & Dumey-Crowley, 2014). According to Spector (2012) 90% of faculty report that students are prepared to practice safe, quality care as opposed to 10% of nursing leaders in practice. Nursing students spend many hours in rigorous education in the classroom and clinical settings to develop specific competencies that translate into the application of knowledge, skills, and attitudes. An article by Bartels and Bednash (2005) reported an increased need for nurses due to an ever-increasing population, which is living longer. The increased need for nurses in the healthcare setting generates a significant challenge as nursing programs increase student enrollments. Increases in student enrollment have consequently created pressure on nursing program curriculum to create learning environments where students must master the competencies necessary for practice. Suitable academic competency preparation is essential to provide the new nursing graduate with fundamental entry

levels skills and clinical judgment needed to deliver quality patient care in a safe and effective manner (Durham & Aldin, 2008; AACN Creating a More Highly Qualified Nursing Workforce, n.d.).

Nursing programs are required by national accrediting agencies to provide education in delineated competency areas to demonstrate that new graduates are ready for licensure and to enter the practice of nursing (Saintsing, Gibson, & Pennington, 2011). Nursing accreditation organizations such as the Accreditation Commission for Education in Nursing (ACEN) and the Commission on Collegiate Nursing Education (CCNE) serve to establish the professional standards for accredited nursing programs. ACEN is a voluntary nongovernmental accrediting body that focuses on meeting stakeholder needs and funding needs for students who seek financial assistance to access Title IV-HEA programs (ACEN, 2014). ACEN accredits schools include practical, diploma, baccalaureate, and graduate level programs. Of the BSN nursing programs in the United States, 602 programs are accredited by the Commission on Collegiate Nursing Education (CCNE, 2014) and 217 programs are accredited by the Accreditation Commission for Education for Nursing (ACEN, 2014).

The Commission on Collegiate Nursing Education (CCNE) is a voluntary private accrediting agency with a mission to serve all stakeholders and to hold nursing programs accountable for providing education that meets nursing practice standards. The CCNE accredits programs with baccalaureate and higher-level academic programs. Within the structure of CCNE, four standards are outlined including: (a) Program quality: Mission and governance, (b) Program quality: Institutional commitment and resources, (c) Program quality: Curriculum and teaching-learning practices, and (d) Program effectiveness: Assessment and achievement of program outcomes (CCNE, 2014). The standards guide program development, assessment of

curriculum and practice standards, and competencies. Standard three of CCNE assesses program quality and requires that the “BSN Essentials” are demonstrated in the program. The “BSN Essentials” provide a framework to plan curriculum and designate competencies that align with CCNE.

The BSN Essentials are a set of nine competencies that are required for demonstration of proficiency prior to graduation (AACN, 2014). Six QSEN competencies, as described above, can be aligned with the nine BSN Essentials. Of the six QSEN competencies, informatics was selected as the focus of this study based on the importance of this competency to patient safety and quality of patient care (Boykins, 2014). The 2008 ANA Scope and Standards of Nursing Informatics Practice provides criteria list expected of nurses as they move through levels of practice. For example, demonstration for the beginning nurse includes competency in the following areas: (a) basic computer knowledge, (b) application of skills in both the clinical and administrative areas of information technology including evidence-based practice, (c) documenting and accessing patient data, (d) using information technology as a source for patient safety, and (e) identifying the nurse’s role with the use of information technology (Hebda & Czar, p. 12-13, 2013). Informatics competencies encompass many areas of proficiency learning for the BSN nursing student and continue to involve extensive utilization in the health care setting and ongoing learning with technological advances.

Statement of the Problem

In 2004, President Bush issued an executive order that all Americans have their medical information contained within an electronic health record by 2014 (Ornes & Gassert, 2007). The 2014 deadline in informatics was mandated for healthcare facilities and the need to provide updated technology information for nurses entering the workforce has been redefined and gives a

greater emphasis in the nursing education process (Fetter, 2008, p. 1). One definition of the term informatics is to make information out of collected data (Hebda & Czar, p. 6, 2013). Hebda and Czar further define informatics in nursing as using "...information and technology to support all aspects of nursing care." An article by Fetter (2008) also explained that information technology is an important component to "improving quality care and efficiency and reducing medical errors" (p. 1). To acquire this competency a smooth transition from the academic setting to nursing practice must occur and licensed nurses must be prepared to face rapid changes that will occur in the health care setting in the area of technology.

According to McBride (2005), undergraduate nursing programs are responsible for preparing the students to deliver safe, quality care. Programs must provide a curriculum and clinical experiences that builds technology competence in all areas of nursing practice. As healthcare technology advances, so does the need to continuously evolve the nursing curriculum to provide technologically competent nurses into the workforce who are capable of demonstrating proficiency in basic healthcare technologies.

Purpose of Study

This study addressed recent BSN graduates' perceptions of academic preparedness with QSEN informatics competencies. An explanatory sequential mixed methods design was utilized in collecting quantitative data and then explaining those results with in-depth qualitative data. In the first phase of the study, an online survey was used to collect information from BSN graduates at a large, mid-south public research university to determine recent graduates' perception of academic preparedness with QSEN informatics competencies. The second, qualitative phase employed interviews with graduates as a means to better understand and help explain the quantitative results (Creswell, 2013, p. 134).

Research Questions

The following research questions guided this study:

1. How do recent BSN graduates perceive that their academic program of study prepared them to practice informatics competently?
2. How do recent BSN graduates perceive the importance of informatics competencies to their daily practice?
3. Which informatics competency areas do recent BSN graduates perceive as requiring more attention academically for the preparation of current nursing students to prepare them for nursing practice?

Assumptions

Several assumptions underlie this study.

1. This study assumed that upon successful completion of a nursing program, a new graduate will be prepared to begin a career in the nursing profession with the knowledge and skills necessary to gain licensure and begin nursing practice.
2. The participants responded honestly to all the questions posed in the study.
3. All participants are or have been employed as a registered nurse in a healthcare setting.

Delimitations and Limitations of the Study

Several delimitations were imposed in this study. Data was obtained by BSN graduates in one public research university in the mid-south region of the United States. A further delimitation was that only BSN graduates from May 2007 through May 2013 were included in the study.

Two limitations existed at the beginning of this study. No current mailing list existed for the BSN students that graduated during the years included by this study; some graduates may

have unintentionally been eliminated from the web-based survey. A second limitation relates to the generalization of the findings of this study to other institutions because the study was limited to one institution and only for a specific time frame and that the results may not be generalizable to all BSN programs. Another potential limitation is that QSEN did not exist prior to 2005 and that limited which students could participate in the study.

Significance of Study

One significance of the study was to demonstrate the importance of academic preparation related to the registered nurse in informatics. Nursing programs are monitored by the state board of nursing and nursing student graduates receive licensure as set by specific nursing board criteria for each individual state for which the program is located. Upon successful completion of the National Council Licensure Examination (NCLEX) the newly licensed registered nurse is expected to be prepared to practice nursing. According to the NLCEX examination website the examination "measures the competencies needed to perform safely and effectively as a newly licensed, entry-level nurse" (NCSBN NCLEX Test Plan, 2013). Successful completion of a nursing program and passing of the NCLEX examination signifies entry into the healthcare setting as a newly licensed BSN nurse and that professional is considered minimally safe to provide quality care to patients. Integrated into the complex nature of nursing practice is technology and its implications to impact safety and quality while providing a focus on evidence-based practice. (NCSBN NCLEX-RN Test Plan, 2013).

Another significance of the study was to identify QSEN informatics competency preparation for practice. Accreditation standards and criteria outcomes from accrediting bodies serve to guide nursing programs with curriculum development and assessment. Competencies arise from national nursing education accrediting organization standards as well as

recommendations from healthcare stakeholders. CCNE accreditation includes competency expectations for programs with alignment of QSEN competencies. As stated previously, QSEN contains six competency areas that are expected for nurses to perform safe, quality care (Cronenwett et al., 2007). Focus on curriculum development and placement of critical competencies is indicated for faculty when developing courses due to a previously report 49% to 53% of novice nurses making errors (Saintsing et al., 2011). Due to the high number of patient errors, faculty involvement in curriculum development and intervention is essential.

Additional significance of the study was to identify if academic competency development was adequate for competent practice with informatics. Employers anticipate that new BSN nurses enter the nursing profession with academic competency experiences that will provide nurses for an autonomous practice and new nurses will possess the minimal skills necessary to navigate technological advances. New nurses who display a lack of autonomy, confidence, and experience with competencies are unprepared to practice nursing. Lack of competency preparation could also prove to be a physical threat to the patient and a risk management threat to the facility. Saintsing, Gibson, and Pennington (2011) reported that approximately 75% of new nurses make medication errors and 37% of new nurses delay medical care to patients. The significance of these high statistics of mistakes in patient care, especially medication error, demands that students receive adequate education in their academic program in technology. Benner (1982) indicated that minimally the novice nurse should be capable of performing care that is task driven which involves competent use of basic patient care technologies. According to AACN the 2008 BSN Essentials specify the necessity of literacy in both areas of patient care technologies and information management as a means to deliver safe and cost-effective care (AACN, Essentials Series, 2014).

Definition of Terms

To provide for consistency and understanding of the study, definitions of several key terms used throughout the study appear below.

Acute Care. Hirshon, et al. (2013) elaborated on what acute care should look like by stating that “...acute care encompasses a range of clinical health-care functions, including emergency medicine, trauma care, pre-hospital emergency care, acute care surgery, critical care, urgent care and short-term inpatient stabilization” (p. 386). For the purpose of this study the words acute care and hospital are used interchangeably.

Competence. The American Nurses Association (ANA, 2010) drafted a position statement which defined competence as “... performing successfully at an expected level” (p. 18). Another definition of the term competence is “The ability to do something successfully or efficiently (Oxford Dictionaries online, 2014). According to Fernandez (2012), competence in education of healthcare professionals relates to the level of knowledge and skills required.

Competency. The American Nurses Association (ANA) also drafted a position statement which defined competency. Competency is defined as “an expected level of performance that integrates knowledge, skills, abilities, and judgment” (p. 18). Contained in the same position paper was a statement which noted that competency determination can be evaluated using “...integration of knowledge, skills, abilities, and judgment [that] occurs in formal, informal, and reflective learning experiences” (ANA, 2010). Axley (2008) completed a concept analysis on the word competency. The intent of her study was to identify a unified understanding of the definition of the word competency since the term was continuously used in healthcare literature but lacked a clear definition. Axley concluded that competency was defined as a necessity to provide “safe care, protect the public, and maintain the credibility of nurses” (p. 221).

Informatics. Informatics as defined by QSEN was “information and technology to communicate, manage knowledge, mitigate error, and support decision making” (QSEN, Pre-licensure KSAS, pp. 7-8). Examples of informatics competencies are specific technology-based skills needed for safety in care practice and communication, documentation of appropriate language using technology, utilization of data for analysis to improve patient care, the use of technology use for improvements in safety, ethical situations, safeguarding data contained within systems for security of patient data, proper and well thought-through planning prior to introducing new technologies for caregiving, and how all of the above contribute to safe, quality care and improved patient outcomes for their populations of patients (BSN Essentials, 2008, pp. 18-19). According to Hebda and Czar (2013), informatics is defined as “the science and art of turning data into information” (p. 6). Medical informatics as defined is a term applied to all healthcare disciplines including medical practice according to Hebda and Czar. Nursing informatics is further defined by Hebda and Czar as “the use of information and computer technology to support all aspects of nursing care, including direct delivery of care, administration, education, and research” (p. 6).

Supervised Clinical Instruction. The National Council for State Boards of Nursing (NCSBN) defined supervised clinical instruction as being “the role of qualified nursing program faculty in facilitating student clinical learning” (NCSBN, 2005, p. 3). Application of learned knowledge is applied during supervised clinical instruction where students interact with patients in a healthcare setting.

Theoretical Frameworks

This study is based on three related theories: Bloom’s Taxonomy, QSEN competency-based learning, and Benner’s Novice to Expert theory. Knowledge, skills, and attitudes were

first introduced by Benjamin Bloom in 1956 (Bloom, n.d.). The original model incorporated three domain areas known as “cognitive, attitudinal, and psychomotor” (Deakin, 1994, p. 85) and presented a comprehensive method that identified learning in all three domains. As a result, nursing curriculum could be designed with three domains in mind as students’ progress through stages of learning. Upon completion of the students’ academic program of study students can demonstrate and achieve levels of knowledge, skills, and attitudes for quality of nursing practice and patient safety. Student development can be measured in each domain area. At the conclusion of learning each student has achieved an individual level of knowledge, skill, or attitude (Bloom, n.d.).

QSEN presents six competencies areas and three learning domains (knowledge, skills, and attitudes) similar to Bloom’s taxonomy that aid students in the acquisition of nursing competencies. The QSEN Initiative was designed to guide curriculum development for baccalaureate nursing students and to prepare them to gain proficiency in competency areas that enhance quality and safety for patients (QSEN, 2014). The QSEN competencies are used by nursing programs to design and assess the curriculum and their students. Seventeen expected outcomes are included within the QSEN informatics competency list (see Appendix A) and students are expected to demonstrate proficiency at the completion of their academic program. (QSEN Institute Competencies, 2013).

Benner’s Novice to Expert Theory proposes the notion that new nurses enter practice at the novice stage and as they gain experience they advance through the five stages to expert (Deakin, 1994, pp. 128-129). At the novice stage, the new nurse understands tasks and rules but has not had much experience to guide judgment in complex clinical decisions in nursing school. (Benner, 1982, p. 403). According to Benner the new nurse’s ability to recognize previous

experiences in the advanced beginner stage assists the nurse with the ability to “demonstrate marginally acceptable performance” (Benner, 1982, p. 403). Benner suggested that the advanced level stage indicated new nurses had the ability to recognize and make meaning out of experiences (1982, pp. 403-404). Within each of Benner’s levels of learning, competencies including QSEN knowledge, skills, and attitudes (KSA) exist at varied degrees of understanding.

The above theories and frameworks align Bloom’s taxonomy with QSEN competencies and can be placed within the Benner Novice to Expert framework of skill acquisition. QSEN competencies also serve to meet accreditation standards required by nursing program to prepare graduates for safe, quality practice.

Summary

This chapter introduced the background, statement of the problem, purpose of the study, and research questions. Also presented were the limitations and delimitations, significance, and theoretical framework. A key significance of this study was gaining an understanding of the perceptions that practicing registered nurses hold about their academic preparation for informatics. Results of this inquiry may be used to provide direction for future curriculum planning involving QSEN informatics competencies in the nursing program preparing BSN nurses.

Chapter II

Literature Review

The current state of healthcare includes many technologies and complex illnesses that did not exist in past decades. The literature suggests that many new nurses enter into practice lacking the ability to perform with competence in areas such as clinical competence, skill competence, technology competency, and clinical judgment. A complex list of recommended competencies has left many unanswered questions about the determination and importance of critical competencies that affect patient safety and quality care.

Readiness for clinical nursing practice involves several years of academic preparation. According to Hughes (2008), society's perception is that recent nurse graduates are academically prepared to enter practice with competence and confidence and have the necessary nursing technological skills in informatics based competencies. While considerable attention in academic nursing programs focus on problem-solving and critical thinking with non-technological skills, the importance of competent, skill-based nursing graduates who can think critically and can apply technical skills cannot be overlooked.

For this literature review searched terms were located on research databases utilizing EBSCO, ProQuest, and Google Scholar™. A list of articles, research reports, and dissertations was generated and reviewed. These initial sources were used to discover additional relevant literature findings. Search words used to identify articles and books were “clinical competency,” “nursing competency,” “competent,” “competency preparation,” “competency assessment,” “skills competencies,” “technical competency,” “informatics,” “informatics competency,” “QSEN,” “QSEN competencies,” “new nurse,” “graduate nurse,” “graduate perceptions,” “perceptions,” “readiness for practice,” “CCNE,” “AACN,” and “transition to practice.” A

combination of the words was utilized to gain a more defined list of articles pertinent to the topic area. Primary search years were identified between 2000 and 2013 to gain the most up-to-date literature of the topic area. Articles identified prior to the year 2000 were selected based on their historical significance to the topic area.

The purpose of this study was to examine recent BSN graduates perceptions of their academic preparedness to utilize QSEN informatics competencies in practice. Chapter II contains the following sections (a) nursing competencies, (b) informatics competencies, (c) readiness for practice, (d) new graduate's perceptions, and (e) theoretical frameworks, and (f) chapter summary.

Nursing Competencies

Confusion and misunderstanding surround the definition of competency. As early as the 1990s, the state of Texas became a pioneer in the area of competency determination for the nursing profession (Poster et al., 2005). The term competencies arrived in nursing literature in the same decade according to Poster et al. Efforts by Texas nursing academics and nursing practitioners collaborated by taking ownership for new nurse preparation to practice and created their own list of expected competencies that have served as a model. A decade after Texas established its first competencies, various nursing organizations have the created a matrix of general nursing competencies that build upon different academic levels of nursing. The intent of the nursing organizations was to develop a common set of competencies for nurse educators.

Nursing literature suggest that the term competency may be hands-on skill or critical thinking related in terms of expectations for students learning. A concept analysis was performed by Axley (2008) as a means to investigate and define competency to standardize the word in nursing education and clinical practice. The use of the term competency can be found in

nursing literature as early as the 1990s and was linked to evaluation of nursing students learning. Axley's investigation found several versions of the word competency related to healthcare and nursing. Characteristics of the concept included use of the term in areas of knowledge, actions, professional standards, internal regulation, and dynamic state (2008, p. 218).

An earlier study by Utley-Smith (2004) surveyed nursing administrators across a variety of healthcare settings to determine the most needed competencies used by nurses. The purpose of the study was to recognize relevant competencies considered necessary for success in nursing practice. Ongoing changes in the healthcare setting require nursing programs to provide proper preparation in competency areas. The study identified competency sets in the areas of health promotion, supervision, interpersonal communication, direct care, computer technology, and caseload management. Findings showed that competency needs were slightly different between each healthcare setting based on nurse responsibility and practice focus. Higher importance was placed on competencies such as direct patient care and communication yet the study did not find that less significant focus be placed on direct patient care skills (p. 170).

Generating a standard nurse competence scale for hospital settings was the focus of a study by Meretoja, Isoaho, and Leino-Kilpi (2004). A Nurse Competence Scale (NCS) was developed after the authors reviewed the literature and determined that existing instruments lacked a "reliable and accurate measure" (p. 125) for nurse competencies. Competencies for the NCS were determined by reviewing hospital-based competency expectations. Doctoral students reviewed the scale for competency agreement and inter-rater reliability was established. A pilot study was conducted in a hospital setting to clarify the competency categories. Hospital administrators were then asked to further clarify wording of each competency. A NCS was applied to measure the strength of responses using 73 items with a four point Likert-type scale.

The results showed that nurses self-reported a "high level" (pp. 124, 126, 128, 131) of competence for most competency categories.

Problem-solving and critical thinking are two necessary competencies needed by all nurses, particularly recent graduates that are beginning or early in practice. del Bueno (2005) looked at Performance Based Development System (PBDS) assessment outcomes, comparing results of new graduate nurses with experienced nurses who have had more than one year of experience. The results from 1995 to 2004 showed that new nurses scored less than 35% for practice application of higher thinking and clinical judgment as compared the 62%-72% of experienced nurses. del Bueno explained that nurse educators had concerns that students were less prepared academically as compared to students of the past. According to results from the PBDS, students have not changed significantly over time in terms of being prepared for practice. Suggestions on how nurse educators might improve the clinical judgment of students were involvement in learning activities that may promote group learning, thinking, and questioning students about specific scenarios or situations.

Nursing programs provide a variety of educational experiences for their students. Poster et al. (2005) examined the Texas Board of Nursing Education's Board method for revision of the 1993 "Essential Competencies of Texas Graduates of Education Programs in Nursing" across nursing programs of all education levels. Vocational-licensed practical nurse, diploma-registered nurse, associate-registered nurse, and baccalaureate registered nurse programs across the state of Texas were among the programs included for review of competencies based on the expected skills needed for entry to practice level nursing. The revision of the competencies was based on previous Texas Nursing Board criteria that focused on the building of "knowledge, judgment, skills, and professional values" (p. 18) across all levels of nursing education. Texas nursing

schools included the revised competencies into their curriculum to provide greater relevance to course outcomes and preparedness of nurses who were entering practice.

Many employers have indicated that nursing graduates are not as prepared for practice as they should be according to a study by Burns and Poster (2008). The authors' investigation found that a competency "gap" (p. 67) exists between academia and nursing practice. One of the questions posed was to determine the differences between competent, competence, and competency and at what level of competency new nurses should be expected to perform. The article discusses a performance-based development system (pp. 69-70) developed by del Bueno that was used to test new and experienced nursing graduate performance in hospitals in the North Texas area. Many new graduates fell below the expected performance score, which in turn left hospitals wondering why some new nurses performed better than others and what needed to be done to improve new graduate performance. A summer institute was held to bring academia and healthcare together to explore clinical conditions that created a high-risk to the patient with an underprepared nurse. The consortium involved both nursing faculty and hospital nursing representatives who developed transitional modules that would enhance nursing graduate preparation for the profession. Modules were prepared and pilot tested in two nursing schools to prepare students for practice as new nurses. The project provided benefits to new graduates by preparing them for common conditions that could arise and create an environment of deficient safety and quality.

In a longitudinal study covering a 10-year period Ulrich et al. (2010) examined the success of a nurse residency program primarily aimed at preparing new nurses for practice. One of the important elements of the residency program was the acquisition of competency. The Slater Nursing Competencies Rating Scale was given to the resident nurses and compared to

observing preceptors. The self-reporting of both the residents and observers only slightly improved competency development over the period of the residency program. Both hospital and graduate nurses benefitted from the program in terms of safer, quality nursing practice and reduced turnover.

Implementation of the Competency Outcomes and Performance Assessment Model (COPA) in two BSN nursing programs and an internship program in one state were the basis of an article by Lenburg, Abdur-Rahman, Spencer, Boyer, and Klein (2011). The authors explained the implementation of the COPA model in the academic and pre-employment settings would provide healthcare organizations with better prepared nurses who display competent preparedness in eight core areas called "practice competencies" (pp. 290-291). The COPA model was pilot tested under the guidance of the model developers. The pilot study served to identify preparedness of students in competency areas and to uncover weaknesses in faculty preparation for competency areas that required curriculum changes in the specified competency areas. The core competency areas included in the development stages were assessment and intervention, communication, critical thinking, human caring relationships, management, leadership, teaching, and knowledge integration (Lenburg et al., 2011, p. 291). Each competency area served to improve patient safety. The COPA conceptual model served to prepare course and program outcomes for multiple nursing programs and nurse residency programs as a new alternative to provide competency learning to nursing students.

Efforts were being made during the early 2000s to address national concerns from the Institute of Medicine (2011) and public reports that were made regarding patient quality and safety. National quality and safety of healthcare concerns forced the QSEN initiative to lead the effort to standardize competencies for use by nursing programs. The expectation was to direct

learning of critical competencies that would impact healthcare practices by generating safer and better quality patient care. Nursing standards were also further defined as a result that enhanced preparation of new nurses for practice.

Healthcare practice and public safety and quality care concerns were the focus of the Quality and Safety Education for Nurses (QSEN). QSEN is housed under the American Association of the Colleges of Nursing (AACN) and is funded by the Robert Wood Johnson Foundation, an organization focused on the improvement of healthcare for Americans. The original recommendation for competencies was developed by the Institute of Medicine (IOM) and adopted by QSEN. Six QSEN competencies were adopted under the category areas of "patient-centered care, teamwork and collaboration, evidence-based practice, quality improvement, safety, and informatics" (QSEN Institute Pre-licensure KSAs, 2013, pp. 1-9).

Cronenwett et al. (2007) presented all six competencies with specific outcomes under the areas of "knowledge, skills, and attitudes (KSA's)" (p. 126). QSEN professionals challenged the nursing education community to investigate and incorporate the competencies into the nursing curriculum. Several workshops were made available to include all nursing schools and selected faculty who were then tasked with presenting the QSEN initiative to faculty in their own nursing programs. Competency implementation had to be established in academic program clinical settings or in simulation labs. Further suggestions were made on getting the students to reflect on the competency or work through case studies. This design was used to assure that all expected competencies were covered across the span of the curriculum and to ensure that students were exposed to the content.

Nursing educators were surveyed by QSEN leaders to determine the level of inclusion for safety and quality competencies in nursing curricula across 195 RN level nursing programs in the

United States. Smith, Cronenwett, and Sherwood (2007) surveyed nursing directors and determined the percentage of courses that contained QSEN competency content in the areas of "patient-centered care, teamwork and collaboration, evidence-based practice, quality improvement, safety, and informatics" (p. 132). The study also sought to determine pedagogical strategies that could be used for each competency area. Examples of pedagogical strategies included lecture, clinical practice experience, case studies, and simulation. Lecture was reported as the most used pedagogical strategy for the patient-centered care competency (94%) closely followed by clinical practicum (93%) while strategies for informatics competency were reported using pedagogies such as web-based learning (68%) followed by readings (63%). Expertise of nursing faculty was also studied reporting evidence-based practice (37%) and informatics (23%) as the areas with the least expertise reported across programs surveyed.

Informatics Competencies

In the area of technology and informatics many nursing administrators and nursing educators have had to reconsider competencies. The central question has been what is meant by the concept of competency and what competencies are necessary for professional nurses? An earlier investigation by Staggers, Gassert, and Curran (2001) sought to identify definitions of informatics and specifically examined the terms knowledge and skills. The authors reviewed existing literature to determine competency expectations in areas of nursing education and practice with the goal to assemble lists of essential competencies that would encompass four levels of nurses based on experience. Staggers et al. concluded the investigation with four main areas of nursing informatics (NI) competencies based on experience level for "beginning nurse, experienced nurse, informatics specialist, and informatics innovator" (p. 304). Of the 304 total competencies were identified by experts for all levels, 43 nursing informatics skills comprised

the list indicated for beginning nurses. Of the 43 competencies identified for beginning nurses, 31 out of 43 were skill-based.

Skills in computer and information technology were the focus of a study by Ornes and Gassert (2007). Patient safety and quality of care are key concerns in the healthcare setting and require a high level of preparation of new nurses coming into practice. The study looked at existing literature to determine if adequate curriculum content existed to support the educational needs of technology and informatics in one BSN nursing program. The tool used to assess curriculum for informatics content was the result from a previous study by Staggers et al. who listed competencies according to four experience level. A matrix was created to serve as a tool to assess current curriculum. Findings from this study suggested that informatics was not integrated into curriculum to degree necessary that student mastery would occur. Faculty inclusion of competencies was considered the main barrier to student mastery of informatics. The study recommended that programs improve faculty knowledge of informatics with an end goal of increasing exposure to students in all courses.

Competencies in technology and information literacy are necessary to insure both knowledge and skill for new nurses in practice according to Flood, Gasiewicz, and Delpier (2010). The authors acknowledged the importance of informatics competency acquisition by new nursing graduates as they enter practice. The challenge for nursing educators is to ensure that students receive informatics training and that informatics occurred throughout levels of nursing program curriculum. This article introduced five proposed “assignments” designed to integrate information literacy into curriculum to enhance informatics competencies. Each assignment is progressive as information is introduced to the student. Programs are encouraged

to implement and evaluate the effectiveness of plans such as the five step information literacy plan to increase preparation for practice.

Readiness for Practice

A common concern for many employers is that new nurses enter practice without the necessary knowledge and skills to perform competently based on literature reported by Marshburn, Engelke, and Swanson (2009). The researchers performed a retrospective study with a descriptive correlation design that focused on nurses working in the acute care setting. The 265 new nurses were given two surveys. One survey looked at performance levels in skills, communication, and problem solving; the second looked at nurse experience. The new nurses were asked to identify the "top skills that they were most uncomfortable in performing" (p. 429). Nurses reported their perception of patient care giving and professional role performance. The study emphasized the importance that new graduates understand their own "perceptions of their own knowledge and skills" (p. 430) that must be in alignment with their comfort of providing care. As new nurses gain experience with patients, their confidence, comfort and ability to perform skills safely should increase.

One community based transition to practice program was evaluated for effectiveness in a study by Dyess and Sherman (2009). The Novice Nurse Leadership Institute (NNLI) was implemented in southern Florida to "strengthen the competencies for new nurses" (p. 405) as they first entered practice. Another goal of the program was to promote retention and future leadership among the nurses. NNLI focused on the post-licensure learning which was designed to assist nurse graduates' transition from the academic setting into the practice setting. The participants were from a variety of degree programs. A focus group was assembled to determine competency topics that would be covered during a 20 session curriculum. The American

Organization of Nurse Executive (AONE) and the Robert Wood Johnson Executive Nurse Fellows developed competency lists. A semi-structured new graduate group interview was led by a non-affiliated facilitator and recommendations for interventions for new graduates were suggested to provide for a smoother transition into the work setting during the first year of employment.

The perceived lack of readiness of new nurses as they enter practice was the focus of a study by Wolff, Regan, Pesut, and Black (2010). An exploratory study was conducted to look at the perspectives reported by new nurses in the areas of education, practice, and areas that regulated practice. The researchers defined new nurses as those with less than two years of experience, and included nurses from all healthcare settings. Purposeful sampling was used to select the participants who provided information through focus groups. Responses from participants indicated that employers in healthcare settings expected students to be "job ready" (pp. 6-7) with the necessary knowledge and skills to practice beginning level competencies in a safe manner. There was also an expectation that nurses be savvy enough to practice safely and deliver quality care (Wolff et al. 2010).

The National Council of State Boards of Nursing (NCSBN, n. d.) began a longitudinal, multi-institutional, randomized study to evaluate the Transition to Practice (TTP) model. The study began in 2011 and continued until fall 2013. NCSBN designed and developed transition modules to provide curriculum guidance and education to new nurses was completed in an e-learning format with web-based collection of results. Phase I began in the summer of 2011 and feedback was received from new nurses who worked in the hospital setting and have completed the modules. Three states were involved, with more than 150 healthcare setting sites participating. Phase II of the data collection occurred from spring 2012 through October 2013

with new nurses who worked in non-hospital settings. Each phase of the study included a control group and an experimental group. Data analysis occurred at the conclusion of the second phase. After completion of the data analysis, professional members of the NCSBN evaluated the information in fall 2014 to determine if the modules became a regulated practice requirement (NCSBN).

New Graduate Perceptions

Perceptions of beginning practice often include variables that create a positive or negative perception of a new working environment. Halfer and Graf (2006) performed a study over a two year period and surveyed 84 new graduate nurses in an acute care setting. The new nursing graduates were evaluated at three, six, 12, and 18 months to determine perceptions of "graduate confidence" (p. 151) with clinical competence at each point in time of their employment. The respondents voiced different concerns of their experience over the time period of the study. Halfer and Graf (2006) concluded that while no mention was made of specific competencies, the lack of preparedness for new practice was a concern of the new graduates based on survey comments. Some new nurses questioned whether or not the feeling of being overwhelmed was generated by newness as a nurse or by a heavy patient load.

Baccalaureate level nurses were interviewed by Etheridge (2007) over a nine month period beginning with employment as a new nurse to determine if they perceived that they were prepared for clinical competence in the areas of patient safety and clinical judgment. The graduate nurses were interviewed in areas such as developing confidence, learning responsibility, developing relationships with others, and thinking critically. Thinking critically was perceived as performance of skills or thinking critically through an issue. Exposure to the actual performance of tasks and skills were described as being important to learning while in nursing

school. The new graduates reported that faculty modeling and challenging students while in the nursing program clinical setting would have been crucial in their overall development to "think like a nurse" (Etheridge, pp. 25-29) prior to entering practice. Once in the practice setting, the new graduate reported increased learning ongoing evaluation of competencies by experienced nurses who would foster their development to think like a nursing professional.

New nurses are exposed to many new experiences in the first year of nursing practice. A qualitative study by Duchscher (2008) determined if a new nurse had matured through phases of learning as they begin their new role. During the doing phase, the new nurse experienced "doing, being, and knowing" (pp. 444-445). This was the phase where the new nurses questioned their preparedness for the new role, and many new nurses reported that the lack of preparedness for real world experience was related to transition from the academic to practice setting and new expectations. The remaining two phases describe how nurses grow into new roles of questioning and exploring.

The needs of new nurses, based on education preparation, were the basis for the study by Fero, Witsberger, Wesmiller, Zulo, and Hoffman (2009). The study purpose was to determine if academic nursing preparation would result in a higher Performance Based Development System (PBDS) assessment outcomes score. Determining additional educational needs for new nurses was anticipated from the results of the study. Researchers determined that based on the results additional information would need to be collected to determine specific learning needs that could improve critical thinking and other related nursing competencies. The results of the study indicated that academic preparation in baccalaureate and associate level prepared nurses displayed better preparation for practice. The results conflicted with the original research of the

PBDS system (del Bueno, 2001, 2005) that indicated that higher level academic preparation did not prepare the new nurse better than a diploma nurse.

Duchscher (2008) prepared a follow-up study (Duchscher, 2009) that prepared a theoretical framework for transition of nursing students into new practice by starting preparation early. When employers and nurse educators combined efforts of ownership for the transition, the new nurse was more likely to experience a smoother transition into practice. The term that was used in this conceptual model to describe the experience of the nursing graduate (NG) was "transition shock" (Duchscher, 2009, pp. 1004-1005, 1007-1011). Duchscher found that the new nurse transitioned through phases. A transitional shock model was developed to demonstrate how the student role changed between student experience and being in practice. The initial phase of transition left some students feeling incompetent of clinical skills and competencies.

Theoretical Frameworks

The framework for this present study is based on three interrelated concepts. These models or theories include Benner's Mastery Learning, QSEN Competencies Model, and Benner's Novice to Expert Model. Each model or theory is discussed in this section.

Bloom's Mastery Learning

The original Bloom's Taxonomy and Mastery Learning was developed to provide learning objectives to students to improve student "mastery learning" according to Gusky (2005). Bloom's earlier approach to learning in the 1960s and 1970s was more comprehensive and outlined methods for students to learn topics by using a variety of learning approaches that meet the needs of all learners. Previous instructional thought was to reduce the variety of learning to a single simplistic form of educational delivery which was opposite of what Bloom had introduced. The researcher further discussed knowledge and skills as a form of deep learning especially when

combined with more complex cognitive thought processes (p. 8). The combination of “cognitive, affective, and psychomotor” processes (Bloom’s Taxonomy of Learning Domains) was Bloom’s approach to mastering learning material and set the direction for further inquiry and development in education.

QSEN Competencies

In 2005 a project called QSEN Initiative, funded by the Robert Wood Johnson Foundation, was established as the nursing profession responded to the IOM report that addressed the decline of quality and safety in United States healthcare (QSEN Initiative). The five IOM competencies previously mentioned in this inquiry were patient-centered care, working in an interdisciplinary team, evidence-based medicine, quality improvement, and information technology (Greiner & Knebel, 2003, pp. 45-46). QSEN utilized the five competency areas and added the additional competency of safety. Safety was also imbedded within each of the remaining five competencies for a total of six QSEN competencies. The six QSEN competency areas are (a) patient-centered care, (b) teamwork and collaboration, (c) evidenced-based practice, (d) quality improvement, (e) safety, and (f) informatics. Each competency area contains a list of expected competency outcomes that pre-licensure programs should provide to nursing students as they progress through their program of study. Within each competency are domains (categories) called knowledge, skills, and attitudes (KSA). Each domain contains objectives specific to the nursing students’ ability to perform in the KSA domains. At the completion of the degree program, new graduates should have reached a desired level of competence in each competency.

QSEN Informatics Competencies

QSEN Informatics competencies involve far more than just learning how to navigate health records. QSEN defines informatics competencies as the ability to “Use information and technology to communicate, manage knowledge, mitigate error, and support decision-making” (Cronenwett et al., 2007). Informatics knowledge areas include: demonstrating the ability to explain how technology can be used for safe patient care, recognizing vital information necessary in healthcare databases, understanding the advantages and disadvantages communication technologies for patient care and how the tools reliable and provide safety. Informatics competency skill areas include: educating self about information use and how to apply and manage information, documentation and use of the electronic health record, technology communication usage, recognizing and utilizing electronic record alerts and decision-making tools, managing monitoring systems, and discerning between quality electronic and poor electronic and internet healthcare information. QSEN informatics attitudes include: appreciating technology and seeking lifelong learning while understanding that technology is the future of healthcare, valuing the safety features in technology that prevent error and promote decision support and coordination of care, safeguarding patient information and confidentiality, and valuing the nursing profession involvement as stakeholders in healthcare and nursing informatics (QSEN Competencies, 2013). The list of QSEN Informatics Competencies can be located in Appendix A.

Benner’s Novice to Expert

Benner’s 1982 article “From Novice to Expert” contains a model of five proficiency levels that nurses align as they progress through practice. Benner reported that new graduates begin practice at the “novice” or “advanced beginner” stages of the proficiency model.

Progression through the levels is determined by experiences and time working in the profession. The third level in Benner's theory is called the competent level. Benner reported that nurses are typically having experience "on the job two to three years" (p. 404). The "proficient" level is defined for nurses who can see the "overall picture" when faced with an unusual situation. Level five is the "expert" level and has all of the previous attributes plus intuition. More often than not the expert can conclude a situation very quickly even when faced with a new experience.

An article by Saintsing, et al. (2011) sought to identify common errors made by new graduates who are considered performing at the novice level of proficiency. The researchers' identification of preventable errors was thought to assist development of competencies prior to entering practice. Improvements in critical thinking and exposure to technology in nursing program were thought to be solutions to the most commonly made errors, which are medication errors, delay in treatment or care, and patient falls. If new graduates are exposed to clinical experiences and real patient situations in nursing school they are more likely to draw from past experience to assist with critical thinking even as a new graduate. Experiences in patient care and real-time situations differentiate the novice from the advanced beginner according to Benner. No two nursing student clinical experiences are the same so it is difficult to conclude that each student from one nursing program will enter practice with the same level of clinical experience.

Summary

Studies in nursing have attempted to identify and resolve the problematic perception that new nurses either perceive that they lack preparedness for practice or that new employers perceive that new nurses lack preparedness. The literature also indicated that professional organizations and regulatory authorities have a professional stake in required competencies. Two of the key agencies are the Institute of Medicine and National Council of State Boards of

Nursing (NCSBN). Despite the lack of literature that explained competencies prior to the 1990s, nurses have always sought ways to provide better care for patients. With national attention on healthcare and the quality and safety of patient care, a concerted effort has been made in closing the gap between education and practice. Several national level professional organizations have come forward to demand that academia and practice work together to better prepare the nursing workforce.

Questions surfaced in the literature from studies that investigated new nurse perceptions of preparedness for practice. Articles suggested that new graduates often felt underprepared in certain competency area to enter practice. Employer perceptions of new graduate preparedness were also questioned and suggestions were made to collect feedback on necessary practice competency improvement.

Chapter III

Methodology

The purpose of this study was to examine Bachelor of Science in Nursing (BSN) graduates' perceptions of academic preparedness and the importance of the QSEN informatics competencies for practice. The participants included BSN alumni from one university who graduated over a seven-year period from May 2007 through May 2013. All of the participants were licensed practicing RNs at the time of the study. This two-phase inquiry focused on QSEN competency variables in the areas of knowledge, skills, and attitudes. Phase I of the study involved the distribution of a web-based survey instrument provided to the intended target population and utilized quantitative methodology to analyze recent graduates' perceptions. The second phase used qualitative methods to gain a more in-depth understanding of the data through participant interviews.

The following chapter presents the research design of the study. Additionally, a discussion of the methods utilized in both phases is provided.

Research Design

A mixed methods research design was selected for this study, which included a quantitative inquiry followed by qualitative interviews. According to Gay, Mills, and Airasian (2009), “[t]he purpose of mixed methods research is to build on the synergy and strength that exists between quantitative and qualitative research methods to understand a phenomenon more fully than is possible using either quantitative or qualitative methods alone” (p. 462). Creswell (2008) further explained that the primary reason for using a mixed methods research design is that it allows the researcher to use different types of data to “extend, elaborate on, or explain” (p. 552) the initial data collected.

The mixed methods design chosen was “explanatory” and the study was conducted in two distinct phases. Quantitative data were collected and analyzed first followed by qualitative interview data. Creswell (2008) explained that “the rationale for this approach is that quantitative data and results provide a general picture of the research problem; more analysis, specifically through qualitative data collection is needed to refine, extend, or explain the general picture” (p. 560).

Phase I – Quantitative Study

Sample

The sample was selected from a large mid-south, research university BSN nursing program using simple random sampling. A total of 556 participants comprised the BSN graduate population. The criteria for participant inclusion in the study include the following: (a) graduate from the program with a BSN degree, (b) graduated between May 2007 and May 2013, (c) a licensed RN, and (d) currently practicing in a healthcare setting. For graduates prior to 2007, QSEN competencies had not been defined and integrated into @program curriculum. Since no comprehensive list of graduates’ or their current contact information existed, one had to be developed. Several steps were used to develop a list of graduates and their email for the administration of the survey. First, a list was collected from the college in which the nursing program was located for alumni who graduated between spring 2007 and spring 2013 semesters. The list of 556 alumni only contained graduates’ names and email addresses that were provided prior to graduation.

A second step utilized to identify the current email addresses for the survey was through the university alumni association. Graduation semesters for the target population were provided to the university alumni association and the association staff assumed responsibility for emailing

survey letters to active nursing alumni. The alumni association list, which contained 267 alumni, was based upon paid membership and personal member information updates. The alumni association does not release names and contact information due to privacy constraints so it was not known if duplicate emails were sent from both the college list and the alumni association generated list.

The final step used in identifying subjects for the survey was through the use of Facebook. A private message was sent to target population alumni through <https://www.facebook.com/> to solicit interest and participation in the study. A status post was made by the researcher for friends-only on Facebook on July 17, 2013. Graduates were asked to provide an email address to the researcher if they met the study criteria and had interest in receiving a letter with a link to the study and had not been previously contacted. A total of 28 alumni responded to the request. The names received by Facebook were cross-checked with the list provided by the college to update alumni contact information. Regardless how alumni participants were contacted they were asked to only respond once to the survey (see Appendix B).

Instrumentation

The data collection instrument was an online survey using Qualtrics software. An informed consent form (see Appendix B) was included at the beginning of the online survey. When graduates clicked on the link for the survey the informed consent form appeared together with a question concerning participation. The graduates could answer “yes” or “no”. If “yes” was selected for the informed consent, the survey would advance to the first survey question. If “no” was selected, the graduate would exit from participation in the survey.

The survey instrument comprised of 18 questions was developed based on language taken directly from the QSEN Informatics Competencies list (see Appendix A). The researcher contacted QSEN and received oral permission to utilize their competencies for nursing education. Condition for using the QSEN competencies was that the researcher used the exact wording of the QSEN competencies contained within the original QSEN study (Cronenwett et al., 2007). QSEN is currently in phase IV of the original QSEN initiative project and is heavily based on competency assessment, promotion of continued education for nurses, and graduate level nursing QSEN competencies (QSEN Institute Project Overview, 2013). Language used by the researcher in the survey did not deviate from QSEN competencies with the primary purpose of staying accurate to the QSEN definitions. The importance of maintaining QSEN competency integrity was that they “serve as guides to curricular development for formal academic programs, transition to practice and continuing education programs” and they meet the QSEN goal to “meet the challenge of preparing future nurses who will have the knowledge, skills and attitudes (KSAs) necessary to continuously improve the quality and safety of the healthcare systems within which they work” (QSEN Institute Pre-licensure KSAs, 2013). QSEN faculty, who had input into competency development, defined the quality and safety competencies “for the knowledge, skills, and attitudes to be developed in nursing pre-licensure programs for each competency” (QSEN Institute Competencies, 2013). A follow-up request to utilize the initial QSEN Competency list (Cronenwett et al., 2007) was approved through the QSEN website link.

Permission was gained through Copyright Clearance Center’s Rightslink® to use the QSEN Competency material listed in the article. The researcher, also a nurse educator, participated in phase III of the QSEN Project and had implemented competencies outlined by QSEN in the nursing program as a means to improve safety and quality care outcomes for

graduates. An article by Hunt (2012) indicated that “the use of [electronic medical record] EMRs doesn’t necessarily decrease patient safety errors. However, a 2011 study found that they do decrease costs and patient deaths by 34%” (p. 2) verifying the importance of identifying if the nursing program had implemented QSEN competencies and if the graduates had received the knowledge prior to entering nursing practice.

A six point Likert-type scale was used to measure the importance and preparation of QSEN knowledge, skills, and attitudes competencies outcomes for informatics (QSEN Institute Pre-licensure KSAS, 2013). A six-point Likert scale was selected based on an article by Kulas, Stachowski, and Haynes (2008) who explained that Likert-type scales that contain an odd number of choices versus a scale that did not contain a middle response selection had no impact on variability of answers. The researcher chose the six point Likert-type scale to give variability in answers. The use of the Likert-type scale rating system gave the subjects the opportunity to select responses that compares a measure of a “trait, attribute, or characteristic” (p. 176) from a lesser extreme to a greater extreme (Creswell, 2008). Additional questions such as open-ended questions, yes and no questions, select-a-response, and demographics were also included in the survey. The online survey contained five demographic questions, eight questions concerning participants’ perception of QSEN competencies, and four open response questions (see Appendix B).

The survey was conducted after receiving IRB approval and pilot testing the questionnaire (see Appendix I). No changes were made to the survey after the pilot study of the questionnaire. The college-generated and researcher-generated database initial letter was formatted by the researcher and sent by blind copy to each class by graduating semester and year. The blind copy method was used to conceal the email identities of the recipients from

others (dictionary.com, blind copy). This email technique was used to generate a list of undeliverable emails which eliminated from further follow-up emailing. A list of undeliverable emails was generated so the researcher could determine the actual number of valid emails. The alumni association reported that no emails were “kicked back.” Alumni recipients also received a blind copy of the “Initial email letter to participate in online survey.” The researcher reviewed a copy of the email before the alumni association sent their email. The email letter for all recipients contained a hyperlink that directed the subject to the online survey. Once selected, the subjects were de-identified to conceal the identity of the participant for the survey portion of the study.

Pilot Study

Six field pilot subjects were selected utilizing a convenience sampling from experienced clinical instructors currently employed at the university BSN program or were BSN alumni who were currently practicing in a nurse educator role or in another nursing education program but not part of the sample population. Convenience sampling was advantageous because the pilot participants are often available and eager to assist with the research (Creswell, 2008, p. 155). An initial email to participate in the pilot study was sent to the instructors with an attached letter (see Appendix C) to participate. Follow-up survey questions were included in the email letter with instructions to the pilot subjects to respond back to the researcher with changes. The online survey link was emailed to the survey pilot group through the university email address provided by the instructors. A deadline was assigned for the completion of the survey. Six Likert-type categories of KSAs contained questions that were viewed for reliability. Questions to determine validity focused on clarity, flow, length, study expectations, and any other comments related to survey understanding. Pilot subjects completed the online survey during the pilot test period.

Participants were asked to provide feedback to the researcher via email or text-messaging, which allowed for adjustments in the survey questions before the final survey was deployed (Creswell, 2008, p. 402). Each pilot survey subject received the survey, completed the survey, and provided feedback (see Appendix B). Survey subjects were given a list of five follow-up questions to identify question clarity and content-validity of the survey instrument (Creswell, 2008, p. 171-172). No adjustments to the survey questionnaire were made based on the results.

Data Collection

The online survey was emailed simultaneously from the alumni association and the researcher to the target population. The researcher collected online survey data through Qualtrics for a period of time from July 17, 2013 to September 3, 2013. Reminder emails were sent out to the population on July 14, 2013, July 30, 2013, and August 13, 2013 (Appendix C). The total number of graduates that submitted a fully completed survey was 63.

Data Analysis

The following research questions were asked to gain an understanding of the perception of participants as to how well their academic program prepared them to use nursing informatics competencies in practice.

1. How do recent BSN graduates perceive that their academic program of study prepared them to practice informatics competently?

The survey instrument answered this inquiry with questions five through seven that focus on the effectiveness of the nursing program for all QSEN informatics competencies in the areas of knowledge, skills, and attitudes. The Likert-type scale choices ranged from ineffective to very effective on a six-point scale. This question was addressed through descriptive statistics.

2. How do recent BSN graduates perceive the importance of informatics competencies to their daily practice?

Survey questions two through four were used to solicit responses to research question two. The research question was intended to determine if the competencies identified by QSEN were, in the participants' perception, important to their current practice. Descriptive statistics were utilized to analyze research question 2.

3. Which informatics competency areas do recent BSN graduates perceive as requiring more attention academically in the preparation of nursing students to prepare them for nursing practice?

Survey questions five through seven about QSEN competencies inquired about what competencies the academic program needed to devote more time and attention. The survey questions also served to identify competencies areas graduates felt inadequately prepared to perform. Questions 10 and 11 asked the participants which informatics competencies should receive more focus and which should receive less focus. Research question 2 was analyzed by descriptive statistics.

After collecting the survey data files they downloaded in both Microsoft Excel file and SPSS file format for use in data analysis. Microsoft Excel software and IBM SPSS Statistics 20 software was utilized to generate data results. Descriptive statistics were used to examine data trends (Creswell, 2008, pp. 190-191) and inferential statistics (Creswell, 2008, pp. 195-203) were used to compare the perceptions of participants based on gender, age, year of graduation, BSN entry level, and first facility assignment.

Phase II – Qualitative Study

This part of the chapter presents the methods used to conduct phase II of the qualitative study. Phase II data was collected after the completion of Phase I.

Participants

Purposeful sampling was used to select participants who indicated interest in the interview portion of the study. The intent of this sampling method was to choose participants who would provide the most abundant of data that was relevant to the research questions (Creswell, 2008, p. 214). Selection was also based on limiting the usable interview to five participants based on different years of graduation. Selection was also determined based on healthcare work setting to provide a broader overview of technology experiences.

A total of 20 interested participants were identified from the online survey responses. Five participants were selected for the interview based on employment healthcare setting, year of graduation, and gender. Graduates selected were from the years 2009, 2011, and 2012. Healthcare employment sites included were a teaching hospital, military hospital, community hospital, home health and hospice agency, and specialty clinic. The participants were comprised of four females and one male.

Data Collection

Participant interviews and journaling were the primary data collection tools used for the qualitative phase of the study. An interview guide was developed by the researcher that included questions that involved QSEN Informatics competencies to gain insight and enhance the meaning of the survey questions. Five interviews were conducted from the time period August 14, 2013 to August 30, 2013. Once the five participants were selected they were emailed to set up an interview. The purpose of the initial email was to establish a relationship and create an

environment for information sharing with the interviewee (Creswell, 2008, p. 411). A follow-up telephone call was made to each interviewee to confirm the interview. Each participant was emailed an informed consent (see Appendix F) to participate in the interview date, time, and location. The informed consent contained signed authorization from the participant to take part in the interview. Once informed consent was received the researcher emailed the participants an interview guide (see Appendix H) to give the participant time to reflect on the types of questions that would be asked during the interview. Use of an interview guide also prepared the participant for the semi-structured interview and made for a smooth transition from question-to-question in the flow of the interview (Creswell, 2008, p. 412). The semi-structured interview also served as a guide for the researcher but also allowed for follow-up questions (Gill, Stewart, Treasure, & Chadwick, 2008). Additionally each interviewee was prompted to reflect on each question and allowed time to answer each question to the best of their ability. The interviews took place by either telephone or face-to-face videoconferencing but were only audio recorded. Interviews were recording using an Olympus WS-801 digital voice recorder with features that allowed for a clear, well-recorded interview conversation.

Once the interviews were recorded, dictation software was used to transcribe the digitally recorded conversations. The researcher checked and rechecked the data to provide correctness and clarity to transcribed words. The transcribed notes were printed and used for coding and theme designation. A Microsoft® Word table template was created to organize interview questions with interviewee responses. In order to protect the interviewees' identities they were designated with the following pseudonyms: NURSE 1, NURSE 2, NURSE 3, NURSE 4, and NURSE 5. The researcher hand analyzed the data and organized it into segments of information. Information was labeled into meaningful codes according to each interview question (Creswell,

2008, pp. 250-254). Coded notes were repeatedly reflected upon as the researcher progressed through the analysis section of the research process. Continuous reflection of the interviews led to the development of major emerging themes (Creswell, 2008, pp. 256-260) from the data to the point of saturation.

Researcher as Instrument

The topic of interest arose from researcher's interest in educationally preparing nursing students for professional practice in the area of informatics competencies. The researcher has spent 10 years in the practice setting and over 10 years is a faculty in a university nursing school and had worked as course coordinator for two clinical courses and taught the nursing informatics courses to students for four years prior to the research. The combined experiences and interest helped to shape the focus of the research and to make initial contact with the population of interest.

Field Tests

Once the survey pilot study was completed and surveys from participants were received, a field test of the interview guide was conducted. Four BSN alumni were selected to participate in a field test of the interview guide. A convenience sample was also used to select the interview subjects. Subjects for the interview field test were selected based on their level of academic degree, length of time since graduation from the BSN program, and knowledge of current practice setting or educational degree level. The researcher sent each participant a personal email to participate in the pilot study portion of the research.

The pilot interview experts were required to communicate back with the researcher to receive further instructions. Additional instructions were emailed back to each participant. Each email contained a file attached informed consent to participate (see Appendix F) or an informed

consent link with a file attached interview guide (see Appendix G) for review. Once the participant received and returned the signed informed consent, the pilot interviews took place.

During the pilot interview participants indicated to the researcher a preference to communicate using videoconferencing with Facetime®. Additionally signing and scanning the informed consent form (see Appendix F) was found to be inconvenient for all participants therefore Adobe® EchoSign® was utilized to receive secured electronic signatures. The field test allowed for modifications of the wording of the survey and the interview guide instrument to make the instruments easier to administer and analyze (Creswell, 2008, p. 402).

Data Analysis

Information was collected and analyzed from the five Phase II participants. Each interview last approximately 30-45 minutes.

Interview Data Analysis

Dragon Naturally Speaking Version 12 Premium dictation software was used to transcribe the data of the audio-recorded interview. Each interview transcription was reviewed for accuracy. Edits were necessary and a retranscription of the data was completed for each interview (Creswell, 2008, p. 520). Participants were emailed a copy of the interview transcription and encouraged to give feedback about correctness of information. No corrections to the transcripts were identified. Data were then explored by coding the data, identifying merging themes from the codes, providing description, making connection, and conceptualizing the data identified as pertinent to the research questions (Creswell, 2008, pp. 254-260).

1. How do recent BSN graduates perceive that their academic program of study prepared them to practice informatics competently?

Upon agreeing to participate in interview, additional questions probed further into research question #1. The following questions in the interview guide were aimed to gain additional understanding about program preparedness. Question three asked the graduate what informatics adjustments in learning had to be made between the academic setting and practice. The fifth interview question asked about values learned in the academic setting in comparison to what was learned in practice. Number six of the interview guide asked if the program provided knowledge that kept up with changes that occurred in technology. Questions seven of the interview guide asked if graduates were prepared to practice and to perform as a change agent with the purpose to identify how prepared they were for practice. In-depth questions allowed for the recent graduate to expand their explanation to research question 1.

2. How do recent BSN graduates perceive the importance of informatics competencies to their daily practice?

The following interview questions were used to generate greater understanding of research question 2. Interview question “1g” asked the participant about types of informatics used in current practice. The researcher was seeking to identify if there were common technologies that were important to all healthcare practice areas. The eighth question on the interview guide asked the graduate about advantages and disadvantages of healthcare technology in practice. The importance of the questions was to identify what the subject determined was important to everyday practice.

3. Which informatics competency areas do recent BSN graduates perceive as requiring more attention academically for the preparation of current nursing students to prepare them for nursing practice?

Question three of the interview guide asked the graduates about adjustments in informatics learning in the students' academic program. Questions three, four, six, and seven asked questions about program preparation and how transition changes occurred between academic setting and practice. Identification of the competencies that limited the graduate in practice was important to answering this research question.

Coding

Qualitative analysis of interview data followed Creswell's (2008) six recommended steps that process data by identifying codes to provide description and emerging themes (p. 251). The researcher performed the following steps when developing codes and major themes: the individual interview transcripts were carefully read and the researcher made notes in the left margin that pertained to interview questions, highlighted and underlined commonly used words or "text segment" (p. 251) across transcripts, created a separate document to divide and align codes for redundancy, and developed themes revealed by the interview (pp. 251-252).

Themes

A list of codes was assembled from the five interview transcriptions. Common themes emerged from the data. According to Creswell (2008) theme types will surface as either "expected" "unexpected" "hard-to classify" or "major and minor" (p. 257). In the case of this inquiry major themes as well as ordinary (expected) and unexpected themes emerged when the codes were "aggregated together to form a major idea" (p. 256). Identification of themes allowed the researcher to answer the research questions and add greater understanding to the quantitative data collected in the investigation.

Validation of the information was confirmed by emailing typed transcripts to each interviewee to ensure correctness of information. The researcher requested clarification of any

data that was incorrectly transcribed. Each email concluded with a request to notify the researcher by either email or telephone if any data required correcting. If the researcher was not contacted the assumption was that there were no identifiable errors in data collection. No follow-up remarks were made to the researcher. No changes were made to the transcriptions originally coded and themed.

Research Rigor

An interview guide was used based on researcher's knowledge of the content area. Internal consistency occurred through the field test. Measurement of the question content was evaluated using pilot subjects who were knowledgeable in the topic area (Creswell, 2008, p. 172). The initial subject participants were interviewed utilizing the initial format of the pilot interview guide. Four participants were interviewed during the pilot stage. Edits were made to develop the final interview guide (see Appendix H).

An article by Krefting (1991) displayed the Guba model of qualitative trustworthiness for demonstrating research rigor between quantitative and qualitative approaches. Four criteria "truth value, applicability, consistency, and neutrality" (pp. 215-216) exist to demonstrate trustworthiness as it exists in both qualitative and quantitative research methodology. Guba's model (p. 217) demonstrated alignment of rigor with four strategy areas of qualitative trustworthiness that are defined as "credibility, transferability, dependability, and confirmability."

Credibility

The researcher displayed credibility through her professional experience in nursing practice and in nursing education. The interview guide for the qualitative portion of the mixed methods study was prepared based on thorough review of the area of and through in-depth

literature review and review of accrediting bodies and professional organizations that impacted the specific variables of the study. Careful identification of experienced nursing alumni from the same program of study were selected for the field test for careful editing of the interview guide questions prior to conducting the interviews. Transcribed documents were thoroughly reviewed on more than one occasion to identify codes and themes.

Triangulation of evidence is a “process of corroborating evidence from different individuals” or “types of data” (Creswell, 2008, p. 648). Triangulation for this study was verified by comparing transcribed notes to taped interviews. Completion of “member checking” (Cohen & Crabtree, 2006) was used to confirm or deny transcribed interview data by confirming data collected during the interview process and verifying accuracy through member checking. Member checking is considered a method to verify credibility according to Cohen and Crabtree (2006).

Transferability

According to Guba (as cited in Krefting, 1991) transferability can be accomplished by selecting a “nominated sample” (p. 220) of experts to provide clarity of the question before interviewing the selected sample. Changes were made to the interview guide based on feedback during the field study improving transferability of the interview questions to other alumni in same settings. According to Krefting (1991) transferability has “fittingness” and increase the ability for the data to be generalized (pp. 216-217) in similar conditions.

Dependability

Researcher review of the participants’ transcripts and review of coding revealed the same themes when revisited on more than one occasion demonstrating dependability. Dependability with qualitative data is considered difficult in terms of consistency. The best way to ensure a

degree of dependability is to be thorough when describing the research process steps (Krefting, p. 221). The researcher provided a methodical step-by-step explanation of pre- and post-data collection to demonstrate dependability of the study. Edited notes from the field test interviews, digital field test interviews, transcribed interviews, email responses to pilot subjects and sample subjects, cross-referenced interview question notes with interviewees' responses, coding notes, and theme notes served to provide dependability to the study.

Confirmability

The last element of trustworthiness in qualitative research was the researcher's ability to establish confirmability. According to Krefting (1991) confirmability requires that the researcher remain unbiased or demonstrate "neutrality" (p. 217) during the process of inquiry. Maintaining a quality process of inquiry that can be duplicated is also "auditable" according to Guba's method (as cited in Krefting, 1991, p. 221). Guba suggested that the ability to audit and remain neutral is aimed more at interpretation of the data results. The general thought was that with use of field notes and existing data, an external researcher or auditor could use the same information and make "comparable conclusions" about the research process and data collection (p. 221). The researcher prepared, gathered, and analyzed data while making every attempt to not interpret information and to allow the data to reveal themes as presented by the subject participants.

Summary

This chapter described the methodology and procedures used for conducting this mixed method study. The mixed methods study was presented in this chapter were presented in two phases and included the research design, population description of the subjects, instrumentation, pilot study and field test results, the process of survey and interview implementation, analysis of

data as it applies to the research questions, and strategies applied to conduct data analysis. The study addressed a sample of recent graduate BSN nurses from a mid-south research university setting who were RNs currently practicing in the professional field of nursing. Descriptive statistics and qualitative interviews were used to address the research questions.

Chapter IV

Data Presentation and Analysis

The purpose of this study was to investigate alumni from a BSN nursing program concerning their acquisition of informatics competencies and preparedness for nursing practice. An online survey (Phase I) was administered to the participants with an option to take part in an interview at the completion of the survey. In-depth interview data (Phase II) was collected as a means to extend and enrich the survey data. Respondents who were interviewed also participated in Phase I of the study. Description of the participants, research methods, research questions with results, and summary of data for both the quantitative and qualitative data are presented in this chapter.

The Phase I web-based survey was launched mid-July 2013 after completion of a survey pilot study with feedback from six experts in the field of nursing education. The survey was closed and online data collection was finalized in early September 2013. The online survey site was intentionally left open for an additional two weeks beyond August 2013 to allow participants who began the survey study to return and complete the data collection instrument. The second phase of the study began within one week of the survey launch, four nursing alumni experts were identified for a field test of the interview guide and interview process. The pilot interview process took place between July 2013 and early August 2013. Interviewee participants were selected for Phase II and interviewed in August 2013.

Phase I Participant Demographics and Characteristics

This section presents demographics and characteristics of the study participants. The criteria for participant inclusion in the study included the following: (a) graduate from the program with a BSN degree, (b) graduated between May 2007 and May 2013, (c) a licensed RN,

and (d) currently practicing in a healthcare setting. Appendix I provides a summary table of participant demographic and characteristic information by year of graduation. Descriptive statistics were used to describe the demographics and characteristics of the participants, which is presented in the following tables.

Table 1 represents the number and percentage of participants by gender for the survey portion of the study. The majority of participants in this study were female, approximately 89%. Only seven males (11%) completed the study.

Table 1
Gender of Participants

Response	n=63	Frequencies	(%)
Male		7	11.1%
Female		56	88.9

Participants spanned a wide age range as shown in Table 2. Based on the results over 77% of the participants were under the age of 35. Only 3.2% of the nurses were over the age of 55 and 9.5% younger than 25.

Table 2
Age of Participants

Age	n=63	Frequencies	(%)
18-24		6	9.5%
25-34		43	68.3
35-44		6	9.5
45-54		6	9.5
55-64		2	3.2

Students could enter the BSN degree program in three ways. First and most common students entered the university and declared their major as nursing. Over 90% of all participants enter the program in this manner (see Table 3). Students could also enter the program as a transfer student or as an RN seeking a BSN degree.

Table 3
Entry Level into BSN Program

Response	n=63	Frequencies	(%)
Generic BSN		57	90.5%
Transfer BSN		1	1.6
RN to BSN		5	7.9

Table 4 demonstrates that the participants were evenly spread over the graduation years included in the study. The graduation years of 2011 and 2013 had the lowest representation of participants in the study with 3.2% and 6.4% of the participants respectively.

Table 4
Year BSN Completed

Response	Frequencies	(%)
2013	4	6.4%
2012	10	15.9
2011	2	3.2
2010	12	19.0
2009	11	17.5
2008	12	19.0
2007	12	19.0

Phase II Participant Descriptions

The option to participate in an interview was presented to the survey participants. The interviews were intended to elicit in-depth information from participants to build upon data collected in Phase I. Five participants were selected from a list of volunteers. Convenience sampling was used to select nurses to participate in Phase II of the study. It was assumed that participants willing to take part in the qualitative phase of the study had interest and relevant information to share concerning the preparation of students in informatics competencies. To gain some diversity, the participants were then selected based on employment healthcare setting, year of graduation, and gender. The interviews were conducted and transcribed from mid-August 2013 to late August 2013. The interviews were audiotaped, transcribed, and coded for themes.

Participant characteristics for the interview portion of the study are listed in Table 5. Each Phase II participant was given a pseudonym to protect their identity. Table 5 presents the following characteristics of each of the five participants: (a) pseudonym, (b) gender, (c) years in practice, (d) specialty area, and (e) practice setting.

Table 5
Nurse Interview (NURSE) Participant Characteristics

Participant name	Gender	Age Range	Years in Practice	Specialty Area	Practice Setting
NURSE 1	Female	25-34	2 years	Medical-Surgical, Trauma, Critical Care	Military Hospital
NURSE 2	Female	25-34	2 years, 7 months	Medical ICU	Teaching Hospital
NURSE 3	Female	25-34	4 years	Hospice and Palliative Care	Home Health and Hospice
NURSE 4	Male	35-44	8 months	Cardiology and Behavioral Health	Community Hospital
NURSE 5	Female	35-44	6 months	Primary Care Specialty Clinic	Community Clinic

Presentation of the Data

Based on the data collected during the study the results will be presented in this section by the three research questions. Under each research question, Phase I results will appear first followed by Phase II results.

Research Questions

1. How do recent BSN graduates perceive that their academic program of study prepared them to practice informatics competently?

Phase I Quantitative Results

Questions 5 through 7 of the survey addressed the effectiveness of the nursing program in preparing new nurses in informatics competencies (knowledge, skill, and attitudes). A 6-point Likert-type scale was assigned to each question (1=Very ineffective, 2= Ineffective, 3= Somewhat ineffective, 4= Somewhat effective, 5= Very effective, and 6=Extremely effective). Participants were asked to respond to each competency statement and to rate how well their BSN academic program prepared them to practice informatics as a new RN.

Table 6 contains responses to competencies listed as knowledge acquired informatics competencies for all participants of the survey. The participants provided their responses as to how well the program provided them with knowledge about informatics competencies to prepare them for professional practice. Question 5 in the survey consisted of five competency items that were scored by calculating the mean and standard deviation of responses. Based on a mean score of 4.67 the top knowledge competency identified by the respondents was “Explain why information and technology skills are essential for safe patient care.” The overall mean rating on all five knowledge competencies was 4.46.

Table 6
Effectiveness of Nursing Program Preparation for Informatics Knowledge Competencies

Informatics Knowledge Competencies Source: QSEN Competencies, 2013	n=63	Mean	SD
1. Explain why information and technology skills are essential for safe patient care.		4.67	0.82
2. Identify essential information that must be available in a common database to support patient care.		4.30	1.10
3. Contrast benefits and limitations of different technologies and their impact on safety and quality.		4.17	1.13
4. Describe examples of how technology and information management are related to the quality and safety of patient care.		4.62	1.13
5. Recognize the time, effort, and skill required for computers, databases, and other technologies to become reliable and effective tools for patient care.		4.56	1.07

Note: Likert rating scale: 1=Very ineffective, 2= Ineffective, 3= Somewhat ineffective, 4=Somewhat effective, 5= Very effective, and 6=Extremely effective

Table 7 contains responses to informatics “skill” competencies that should be acquired by nursing students in their BSN degree program that will prepare them for practice. There were a total of eight skill competency statements. Collectively, the participants scored a mean rating of at least 4.00 “somewhat effective” on all eight items. The highest rated competency was 4.48 on the item “Apply technology and information management tools to support processes of care.” The lowest rated skill competency was “use information management tools to monitor outcomes of care processes (4.03). The average of the eight skill competencies was 4.26.

Table 7
Effectiveness of Nursing Program Preparation for Informatics Skill Competencies

Informatics Skill Competencies Source: QSEN Competencies, 2013	n=63	Mean	SD
1. Seek education about how information is managed in care settings before providing care.		4.37	1.04
2. Apply technology and information management tools to support safe processes of care.		4.48	0.96
3. Navigate the electronic health record.		4.10	1.34
4. Document and plan patient care in the electronic health record.		4.21	1.27
5. Employ communication technologies to coordinate care for patients.		4.17	1.07
6. Respond appropriately to clinical decision-making supports and alerts.		4.29	1.08
7. Use information management tools to monitor outcomes of care processes.		4.03	1.06
8. Use high quality electronic sources of healthcare information.		4.40	1.09

Note: Likert rating scale: 1=Very ineffective, 2=Ineffective, 3=Somewhat ineffective, 4=Somewhat effective, 5= Very effective, and 6=Extremely effective

Competency statements related to attitudes about informatics appear in Table 8. This table focuses on attitudes new BSN nurses should take away from their academic program when they enter practice. The overall mean average for the four attitude competency statements was 5.00. The competency “protect confidentiality of protected health information in electronic health records” received the highest ranking of 5.29 by student participants.

Table 8
Effectiveness of Nursing Program Preparation for Informatics Attitude Competencies

Informatics Attitude Competencies Source: QSEN Competencies, 2013	n=63	Mean	SD
1. Appreciate the necessity for all health professionals to seek lifelong, continuous learning of information technology skills.		5.06	0.82
2. Value technologies that support clinical decision making, error prevention, and care coordination.		4.94	0.82
3. Protect confidentiality of protected health information in electronic health records.		5.29	0.79
4. Value nurses' involvement in design, selection, implementation, and evaluation of information technologies to support patient care.		4.70	1.20

Note: Likert rating scale: 1=Very ineffective, 2=Ineffective, 3=Somewhat ineffective, 4=Somewhat effective, 5= Very effective, and 6=Extremely effective

Phase II Qualitative Results

This subsection of research question 1 reports the qualitative coding results for this question. Table 9 provides the theme related to research question 1, which emerged from an analysis of the data.

Table 9
Theme 1

Research Question 1:	How do recent BSN graduates perceive that their academic program of study prepared them to practice informatics competently?
Theme	Preparation in informatics in healthcare settings revolves around the electronic health record (EHR), documentation, and protecting the patient information within the system.

Theme 1

Five of the six participants contributed to a dialogue of how well their academic program prepared them for RN practice. The major theme that emerged from the data was the need for the nursing program to provide a greater focus on all aspects of electronic health record (EHR) use. The interviewees mentioned documentation and protection of patient data entry as applied to the use of the EHRs.

Four structured questions were posed to the five interviewees as follows: “During the transition from the academic program to current nursing practice, what types of informatics competency adjustments in learning had to be made? Please provide some examples or stories.” A second question was “What values did you learn in the academic setting that you took into the nursing practice setting and did your academic values differ from the practice setting?” The third question was “Give examples of how your nursing program provided you with knowledge of informatics and healthcare technologies in the ever-changing state of U.S. healthcare?” The final question raised that related to research question 1 was “How did your academic program prepare you as an advocate for change through the constant evolving of healthcare informatics technology and regulations?”

NURSE 1 was employed at a military hospital and had experienced computer documentation that was different from what had been used in the nursing program. Despite her experience with a different EHR system that what she was experienced in she still acquired basic knowledge in the program about how to acquire and protect patient data. As challenges surfaced during her first year in practice she was able to recall standards of informatics learned and was able to apply base knowledge to several challenging situations where protected patient information came into question.

NURSE 1 responded with the following comments:

It is hospital preference on how things get done. For me it was kind of getting used to where the facility wanted everything documented specifically. There is the old phrase “If you didn’t document it, you didn’t do it.” We didn’t get a lot of hands-on practice with it because the clinical sites we were at didn’t want us to have compute access for fear of privacy concerns. It had been ingrained in me from nursing school that you protect your license at all costs. To know that they [IT monitor] can really look at every little change you make and everyone who accesses the records. I started working in [major city with high profile patients] and another great example of how HIPAA was ingrained into my head. Don’t be looking at things that you do not need to be looking at.

NURSE 2 was employed at a large teaching hospital where technology was used expansively in all areas of the hospital system. While she claimed that a huge learning curve existed at the hospital her basic foundation of informatics knowledge was sufficient to build applied experience during her first year of practice.

NURSE 2 observed:

I think that I was prepared with the knowledge of the importance of informatics and the wave of informatics for the future. I knew the knowledge base but did not have the opportunity to put that into practice just yet. As a new graduate, as a seasoned nurse, and as a veteran nurse I think that the program did a good job at establishing that we are always a student whether we are in practice or not. And that we are always a students and that informatics is going to be changing. We were pretty much encouraged to have an open mindset towards informatics. That has also been encouraged at the teaching hospital that the same student mindset and openness and to be someone that is proactive in informatics.

NURSE 4 worked at a community hospital upon graduation. He explained that his past experience and technology expertise facilitated an easier transition into the setting in terms of applied use of EHR, medication cabinets, and monitoring systems. He explained that informatics was incorporated in each nursing program level which added to his knowledge base and confidence upon employment.

NURSE 4 explained:

"If you didn't chart it, it didn't happen." Having experiences with Cerner and two clinical courses in my last semester at [one clinical site] it was a pretty seamless transition for me...just learning more about it. As we were taught in informatics in the class and as it was mentioned in various other classes. One of the things the program stressed was not to get worked up about the specifics of this [computer] program or that program because programs will change. Requirements and laws will change and keeping in mind that you understand the concept of using EMR by using informatics and that power and the safety that they can provide. As long as you understand and keep the safety of the patient in mind.

Summary of Research Question 1:

Graduates overall felt well prepared, although some would have liked more “hands on” experience with electronic health records in the clinical portion of their program. The findings in Phase I appear to indicate that the academic program is very effective at instilling in students the “attitudes” of informatics competencies. On the other hand the program was rated as “somewhat effective” in providing students with necessary knowledge and skills for nursing practice. Phase II of the study emphasized that students were not provided with enough opportunities to translate their knowledge and attitudes about informatics into skills for actual practice.

2. How do recent BSN graduates perceive the importance of informatics competencies to their daily practice?

Phase I Quantitative Results

Questions 2 through 4 addressed the importance of informatics competencies to the participants’ current nursing practice. A 6-point Likert-type scale was assigned to each question (1=Not at all important, 2= Very important, 3= Somewhat unimportant, 4=Somewhat important, 5= Very important, and 6=Extremely important). Participants were asked to respond to how important each informatics competencies were to their practice as newly employed RNs.

Table 10 contained responses to informatics competencies listed as knowledge acquisition considered important to nurses in their current practice. A total of five competencies exist and were rated by the study participants. The participants provided a combined mean average of a 5.11 “very important” on importance of having knowledge of informatics as the competencies relate to practice. The highest rated competency was 5.25 on the item “explain why information and technology skills are essential for safe patient care.” The knowledge

competency was closely followed by “identify essential information that must be available in a common database to support patient care (5.22).

Table 10
Importance of Informatics Knowledge Acquisition Related to Use in Current Nursing Practice

Informatics Knowledge Competencies Source: QSEN Competencies, 2013	n=63	Mean	SD
1. Explain why information and technology skills are essential for safe patient care.		5.25	0.80
2. Identify essential information that must be available in a common database to support patient care.		5.22	0.77
3. Contrast benefits and limitations of different technologies and their impact on safety and quality.		4.87	0.91
4. Describe examples of how technology and information management are related to the quality and safety of patient care.		5.16	0.77
5. Recognize the time, effort, and skill required for computers, databases, and other technologies to become reliable and effective tools for patient care.		5.06	0.88

Note: Likert rating scale: 1=Not at all important, 2= Very important, 3= Somewhat unimportant, 4=Somewhat important, 5= Very important, and 6=Extremely important

Table 11 provides the nurses’ responses to informatics “skills” competencies as rated by importance to nursing practice. There were a total of eight “skills” competency statements rated. The participants provided a mean rating of at least 5.00 “very important” for seven of the eight items. The highest rated “skills” competency was 5.51 on the item “navigate the electronic health record.” The combined mean average of the eight competencies was 5.16.

Table 11
Importance of Informatics Skill Acquisition as Related to Use in Current Nursing Practice

Informatics Skill Competencies Source: QSEN Competencies, 2013	n=63	Mean	SD
1. Seek education about how information is managed in care settings before providing care.		4.64	1.00
2. Apply technology and information management tools to support safe processes of care.		5.21	1.05
3. Navigate the electronic health record.		5.51	0.97
4. Document and plan patient care in the electronic health record.		5.33	0.90
5. Employ communication technologies to coordinate care for patients.		5.10	0.93
6. Respond appropriately to clinical decision-making supports and alerts.		5.27	0.88
7. Use information management tools to monitor outcomes of care processes.		5.13	0.92
8. Use high quality electronic sources of healthcare information.		5.14	1.05

Note: Likert scale rating: 1=Not at all important, 2= Very important, 3= Somewhat unimportant, 4=Somewhat important, 5= Very important, and 6=Extremely important

There were four “attitude” competencies related to informatics. Table 12 contains the responses to the importance of “attitude” informatics competencies as they relate to RN practice. The participants provided a combined mean rating of 5.38 across the four competencies with little variability with an average standard deviation of .85. The highest rated “attitude” statement with a mean score of 5.56 was “value nurses’ involvement in design, selection, implementation, and evaluation of information technologies.”

Table 12
Importance of Informatics Attitude Acquisition Related to Use in Current Nursing Practice

Informatics Attitude Competencies Source: QSEN Competencies, 2013	n=63	Mean	SD
1. Appreciate the necessity for all health professionals to seek lifelong, continuous learning of information technology skills.		5.05	0.96
2. Value technologies that support clinical decision making, error prevention, and care coordination.		5.35	0.86
3. Protect confidentiality of protected health information in electronic health records.		5.54	0.78
4. Value nurses' involvement in design, selection, implementation, and evaluation of information technologies to support patient care.		5.56	0.78

Note: Likert rating scale: 1=Not at all important, 2= Very important, 3= Somewhat unimportant, 4=Somewhat important, 5= Very important, and 6=Extremely important

Phase II Qualitative Results

This subsection of Research Question 2 reports the qualitative coding results for this question. See Table 13 for the Research Question 2 qualitative theme that emerged from the interviews.

Table 13
Theme 2

Research Question 2:	How do recent BSN graduates perceive the importance of informatics competencies to their daily practice?
Theme	Applied experience with data documentation and computerized medical records [EHR] is necessary to guide safe practice and make clinical decision as part of daily practice.

Theme 2

The five participants explained that electronic charting and EHR were important competencies needed for daily practice in all five participant work settings of military hospital, teaching hospital, hospice and home health care facility, community hospital, and specialty clinic. Four of the five Phase II participants described how informatics competencies affected their everyday practice.

NURSE 2 shared experiences from a hospice and home health professional background. Attendance in the nursing program for the participant occurred when technology in healthcare and education was gaining greater focus. NURSE 2 shared her thoughts about experiences with technology in the nursing program “when I was in nursing school most of the charting I did was paper. I had an electronic drug book on my phone so I did use that some in nursing school.” Her transition into the work setting presented new technology encounters that were not experienced in the program. NURSE 2 explained:

The biggest thing that I think of is the electronic charting. So we have questions about electronic charting in the homes, we have laptops that we carry, hospice and palliative care specifically have their own scales that they use for symptoms, pain, and palliative care scales, a fast scale for dementia...and then electronic drug book on my iPhone. For work just having the databases saved in my phone so I can email and contact coworkers very easily even when my computer is not working correctly or don't have my internet connection. I can still get in contact with the people that can assist.

Professional work experience for NURSE 3 was in a practical situation outside of a typical hospital or clinic setting. She explained that the importance of technology when used to retrieve vital information in electronic medical record was very important when providing care to clients. She also explained the need for completeness and accuracy when documenting client data. NURSE 3 made the following observation:

If you really step back and look at the bigger picture you get to see how this is going...there is someone sitting somewhere that is going to be tracking this [and] that is going to see how our patients are responding to our treatments ultimately and so how important those new changes are.

According to NURSE 4, the hospital setting in which he worked was all electronic charting. Compliance on use of electronic handheld barcode scanning devices was also expected to be 100% accurate for each nurse as a means to decrease the incidence of medication errors. NURSE 4 made extensive use of technology and it impacted every aspect of his practice with a

primary focus on data entry and documentation. He explained that the significance of electronic medical record knowledge and usage of interfacing devices confirmed the importance of technology use for patient safety. NURSE 4 shared interesting insight about the advantages of technology. He explained:

The computer is a great tool but it is just a computer. It is about safety but it doesn't do all of your job for you. It is easy to get caught in the trap of it was marked off on the task list but you patient is not doing well. Sometimes the hardware is frustrating because the battery goes out at just the wrong time or sometimes it just randomly restarts and you have to reload all of your information. It just takes time and it is frustrating because we are using it for safety and we don't want to use it but then you would have to wait for it. When it is not working it is frustrating.

NURSE 4 explained the safety element of informatics in additional interview comments.

NURSE 4 further responded:

The nurses do almost 100% electronic medical charting. I chart one assessment per patient per shift. I chart RN observations every two hours. I chart comfort rounds on patients. I chart I's and O's [intake and output]. We use primarily the CareMobile [medication barcode scanner]. We are encouraged to have 100% compliance on that. That's hard because some of the medications and some of the flushes won't scan. The Pyxis is where we get our medications from and it should coordinate with the electronic medical record or the MAR [medication administration record]. We use Cerner, primarily iNet, some Powerchart, desk top computers, computer on wheels, CareMobile handheld device, the camera on the handheld would be very helpful, Pyxis, Omnicell.

NURSE 5 shared her perspective as a novice nurse in a highly technological specialty clinic setting. She explained "...these practices [large city] are so much bigger practices and have a lot of doctors." She observed that she "...was surprised just how savvy they are with it [informatics] for a clinical setting." NURSE 5 went on to explain:

Okay well we actually are very busy especially for clinic. You must be very organized because all the different offices for the doctors are in different places. We use something called NexGen [for electronic health record system] that is one of our own programs. And NexGen is a program that allows us to communicate

with during the day with the doctor back and forth. Send orders to a benefits group. Communicate with other nurses and tasks of calls just anything you can imagine. We do everything you can imagine from that system. Gosh, I go from nursing school to working at this practice with all of this informatics. It blows my mind. I feel like everything that learned nursing school, in the clinical setting, and the classroom setting that I learned so much. It's definitely paying off now that I'm working as a nurse and able to learn...did so well and pleased with my program.

Summary of Research Question 2:

Overall graduates felt that knowledge, skills, and attitudes toward informatics competencies were (knowledge, attitudes, and skills) were found to be “very important” for daily RN. Phase II of the study found technology was involved in every aspect of patient care. NURSE 5 reported, “I guess we are very dependent on that technology” when referring to accessibility to patient charts and the need to access medication profiles. Despite technology advantages, four out of five Phase II participants reported the problem or disadvantage of “downtime” when patient data is not accessible during caregiving. NURSE 2 reported experience with computer “downtime.”

NURSE 2 observed:

For example there was a time I was on night shift and the system was going to be down for three hours. They were doing maintenance. So...I got an admission...I felt that the patient care was somewhat delayed because we were, as a team ... [unable] function without our normal procedures in place. So I think that ... reliance on all of that could be a disadvantage. We might take some of those things for granted outside of informatics...outside of technology.

Research Question 3: Which informatics competency areas do recent BSN graduates perceive as requiring more attention academically for the preparation of current nursing students to prepare them for nursing practice?

Phase I Quantitative Results

Data contained in Table 14 displays participant responses to this open-ended question, which posed the following: “which informatics skills competencies should receive more curriculum focus in the academic setting that are important to your current setting practice?” One-Third of the participants recognized that the BSN program should place greater emphasis on “electronic medical record navigation and hands-on experience.” Ten participants (16%) suggested that “Hands-on experience with different electronic medical records” was an informatics skill set that needed more attention by faculty. Only one other informatics skill was mentioned by more than 9.5% of the participants. This skill, similar to the two highest ranked informatics skills previously noted, was “documenting/charting an appropriate electronic nurse note: documentation types and legal implications.”

Table 14
Informatics Skills Requiring More Curriculum Focus

Informatics Skills Requiring More Focus	n=63	Total	(%)
Electronic Medical Record navigation and hands-on experience		21	33.0%
Hands-on experience with different electronic medical record systems		10	16.0
Documenting/charting an appropriate electronic nurse note; documentation types and legal implications		6	9.5
Communication usage between providers and professionals; etiquette		5	8.0
Future of safety requirements with EMR; alerts		5	8.0
Locating and using high-quality sources of healthcare information; evidence based practice information		4	6.0
System design and workflow integration; system analysis and system performance		3	4.8
Simulated classroom EMR		3	4.8
Hands-on use of bedside electronic devices		3	4.8
Clinical decision making using technology		3	4.8
Data collection and interpretation for care and nursing diagnosis		3	4.8

Informatics Skills Requiring More Focus	n=63	Total	(%)
Continuing education and online learning		2	3.0
Monitoring technologies utilization in the clinical setting		2	3.0
Healthcare resource applications for smart phones		2	3.0
Medication reconciliation experience		2	3.0
Hands-on experience with different electronic medical record systems		2	3.0
Electronic Medical Record navigation and hands-on experience		1	1.5
Apply electronic care plans to real patients		1	1.5
Emphasize that patients are people and computers and software are tools to serve the patient		1	1.5
Order entry and signing off		1	1.5
Information confidentially with technology		1	1.5
Generating reports from data		1	1.5
Apply electronic care plans to real patients		1	1.5
Process documentation and meaningful use		1	1.5
Informatics troubleshooting at clinical facilities		1	1.5
Utilization of online medication and other resources		1	1.5
Information management tools		1	1.5
Clinical teaching and documentation		1	1.5
Nurse as change agent for EMR		1	1.5
Computer charting relevant to Joint Commission		1	1.5

Phase II Qualitative Results

This subsection reports the qualitative results related to Research Question 3. Table 15 provides the qualitative theme that emerged from the interviews.

Table 15
Theme 3

Research Question 3:	Which informatics competency areas do recent BSN graduates perceive as requiring more attention academically for the preparation of current nursing students to prepare them for nursing practice?
Theme	Participants recommended that more emphasize be placed on hands-on EMR computerized documentation.

Theme 3

The primary theme that emerged during the interviews was that nursing students received limited hands-on experience with technology particularly electronic documentation and exposure to a variety of EHR systems. This theme relates to what competency area practicing RNs felt the BSN program needed to do a better job emphasizing with students.

NURSE 1 explained that the nursing school provided experiences to enhance learning but did not always provide the best hands-on experience that she considered would have prepared her more for nursing practice. She offered specific experiences that she felt would have enhanced her readiness to enter practice in the area of documentation. She explained:

I guess that would be kind of a big adjustment for me initially was to figure out how to document in the appropriate places to document and where the appropriate places to document [in the EHR] were. We would always have to kind of like shadow over what nurse we were working with [in nursing school] at the time to see what they were doing and get an idea of it. But definitely just having the broad scope of what is available but helpful.

NURSE 3 entered her first nursing clinical in 2007. Since 2007, technological advancements have presented nursing students with clinical informatics systems changes and changing clinical experiences. NURSE 3 described her experiences as limited to paper charting experience primarily as use of an “electronic drug book on my phone.” She further explained:

I am seeing a trend of different facilities adopting electronic charting in the past few years since I have graduated. A lot of the hospitals that I did clinicals, when they were doing paper charting; I believe are all now doing electronic charting. That is since last year I do believe.

As a novice nurse, NURSE 5 mentioned that her additional exposure to informatics in the clinical setting gave her the experience to “input our informatics patients” during her final semester. Her experience with the large specialty clinic, which she described as “savvy” and “learning the new system” led to her recommendation on informatics competency changes.

NURSE 5 further explained:

Learning these systems, I'd say, was the adjustment of just going from Cerner and Epic so I would say the adjustments would be just learning a new system and going from the hospital setting to a clinic setting and learning a lot of busy work. The hospital where you're just documenting assessments and you are not having to do as much. Making the competency adjustment just learning I guess you'd have to say going from the hospital clinical setting, because we didn't have as much informatics practice and in our clinical rotations. We really didn't have to do much informatics in those environments. In my program we just learned about documentation and paper charting. For example we used a paper charting and we learned in assessment how to do that. Moving from that to what was expected in the electronic health record.

Summary of Research Question 3:

Participants reported an overall need for more exposure in the BSN program to prepare for practice particularly in the area of “electronic medical records” utilization and data entry. The findings in Phase I and Phase II were similar. Phase II participants perhaps were more specific in their belief that specific attention should be given to hands-on skills-based experience with multiple [EHR] systems while in the BSN clinical settings.

Phase I Open Ended Survey Responses

Question 11 on the survey asked the participants’ opinion on what, if any, informatics competencies should have received less focus in the program. Of the survey response results received, almost 40% of the participants indicated that no informatics content should receive less

focus by the faculty (see Table 16). The only other curriculum recommendation with more than five nurses concurring was to provide less historical, evolution, and theory of informatics.

Table 16
Informatics Skills which should Require Less Curriculum Focus by BSN Faculty

Informatics Skills Requiring Less Focus	n= 46	Total	(%)
None skills should be less [decreased]		17	36.9%
Historical, evolution, and the theory of informatics		6	13.0
PDA's and PowerPoints about PDA types and cost		5	10.9
Keep informatics out of the classroom; less book teaching		5	10.9
Comparing and contrasting different systems		4	8.7
Research and management focus		2	4.3
Technology and smart patient rooms		1	2.2
Data storage on and off site		1	2.2
Outdated technologies		1	2.2
APA formatting and margin settings		1	2.2
Privacy and confidentiality of the record		1	2.2
Informatics systems development		1	2.2
Paper charting		1	2.2

Table 17 was an ancillary question inquiring about the participants work experience prior to entry into the BSN program (see Table 17). The question posed: “did you have work experience with healthcare technologies prior to entering the nursing program?”

Table 17
Participants’ Work Experience with Healthcare Technologies Prior to entering the BSN Program

Experience	n=62	Total Response	(%)
Yes		15	23.8%
No		48	77.2

Not surprisingly, 77.2% of the survey respondents report no prior work experience with healthcare technologies prior to enrolling in the BSN program. If participants indicated they had previous experience with technologies they were asked to healthcare experience and associated technologies they had used (see Table 18).

Table 18
Healthcare Experience and Associated Technologies Prior to BSN Program

Experience Prior to Nursing Program	n=15
<ul style="list-style-type: none"> – Work prior to entering program <ul style="list-style-type: none"> – RN prior to RN to BSN, was a Superuser – Laboratory x-ray technician – Physician’s office, converted DOS to EMR, insurance billing, fax machines – Patient care; entered patient care information; ordered tests and meds for physicians – CNA; used EMR – Nurse’s aide in hospital; handheld computers; computer on wheels; in-house education systems – EHR for chart review; patient care documentation – Worked EMR – Clinic that utilized EMR – Health informatics through hospital system – Worked as an aide on a unit that used EMR and handheld input devices 	

Participants of the survey were also asked to report in a “yes” or “no” question if they participated in a new nurse orientation experience during their first employment. Table 19 indicates that over 87% of the BSN graduates received a new nurse orientation.

Table 19
New Nurse Orientation at First Employment Facility

Response	Total	Percentage
Yes	55	87.3%
No	8	12.7

A follow-up question was asked about informatics competencies covered in new nurse orientation. The follow-up open-ended question requested that the participants “give examples of informatics competencies that were introduced during the new nurse orientation.” Participant responses are listed in Table 20. The most common response was that new nurse orientation introduced the RNs computer system navigation specific to the healthcare facility. Survey participants provided multiple responses about orientation competencies provided by new employers.

Table 20
Informatics Competencies Introduced at New Nurse Orientation

Competencies Introduced at New Nurse Orientation	n=63	Number of Responses
Computer system navigation specific to facility		28
Computer documentation/charting; system specific		18
Patient confidentiality/privacy/HIPAA		6
Electronic medication and supply cabinet utilization		6
Portable handheld devices for medication administration		6
Monitoring systems and medical care equipment use; management		6
Entry and location of labs results and other diagnostic test results		5
Patient teaching/discharge instructions; printing procedures and disease process		5
Computer order entry		6
Medication documentation/reconciliation/MAR		5

Competencies Introduced at New Nurse Orientation	n=63	Number of Responses
Locating medication drug manual and procedures online		4
Patient safety/computer safety alerts		3
Evidence-based practice website resources		2
Continuing education online for nursing staff		2
Professional use at the bedside for cell phones, tablets, and computers		1
Communicating with member of the healthcare team process		1
Portable communication devices for healthcare team		1
Legalities of electronic charting/documentation		1
Computer generated nursing care plans		1
Protocols for computer use		1
Trending patient outcomes		1
Consultation requesting		1

Summary

This chapter provided the presentation of data from both Phase I and Phase II of the study. The data were provided by each research question and ancillary questions. In addition to the data the chapter the findings related to each research question. Demographics and characteristics of the survey and interview participants were displayed in tables. Descriptive statistics were presented from the data collected in the survey phase of the study. The qualitative data led to the development of three themes that added depth and helped explain the quantitative results.

Chapter V

Conclusions and Recommendations

The purpose of this mixed methods study was to examine Bachelor of Science in Nursing (BSN) graduates' perceptions of academic preparedness and importance of the QSEN informatics competencies for practice. The participants selected for this two-phased study were graduates from one rapidly expanding nursing program at a state research university in the mid-south region of the United States. The participants for the Phase I survey portion of the study were comprised of recent graduates during the period of May 2007 through May 2013, and be current practicing RNs in a healthcare setting. Phase II, the qualitative part of the study, included five recent graduates who participated in Phase I and volunteered to be interviewed. Three research questions guided this study to help better understand the academic preparedness and importance of QSEN informatics competencies for RNs. The three research questions posed were as follows: (a) How do recent BSN graduates perceive that their academic program of study prepared them to practice informatics competently? (b) How do recent BSN graduates perceive the importance of informatics competencies to their daily practice? (c) Which informatics competency areas do recent BSN graduates perceive as requiring more attention academically for the preparation of current nursing students to prepare them for nursing practice?

This chapter will present a brief overview of the study, the findings and conclusions drawn from the analysis of the data in for Phase I and Phase II of the study. Chapter V also provides the limitations, and recommendations for future research and implications for improved practice, and a summary.

Overview of the Study

Quantitative (Phase I) and qualitative (Phase II) methods were used in the process of collecting and analyzing data to address the research questions posed for this study. Three related research questions were used to guide the data collection in both phases of the study. Phase I utilized an online survey to collect data from recent graduates of a BSN degree program from the period of May 2007 through May 2013. Semi-structured interviews, utilizing an interview guide, were used to collect data from five volunteer participants during Phase II of the study. The online survey was drawn from three sets of QSEN informatics competencies (knowledge, skills, and attitudes). These competencies consist of statements that establish standards for professional nursing practice to ensure patients receive safe, quality nursing care. The survey questions served to elicit understanding of participants' perception of academic instruction of informatics competencies and their importance in nursing practice. The researcher attempted to maintain trustworthiness and rigor of the research data for qualitative data collection. Trustworthiness was verified by using triangulation and member-checking to crosscheck all data collected with notes and taped interviews, using professional experts to field test the interview instrument to ensure clarity of the question, maintaining accurate documentation of the research process, and reporting findings in an unbiased manner.

A summary of the findings are provided by research question findings and will be presented from both Phase I and Phase II of the study. Themes that emerged from the data included (a) importance of EHR experience, documentation, and protecting patient information, (b) need for experience with clinical decision making to guide safe practice and technology including EHR in daily practice, and (c) need for increased hands-on EHR experience in the nursing program.

Research Question 1 – Phase I Quantitative Findings

Research Question 1 stated: “How do recent BSN graduates perceive that their academic program of study prepared them to practice informatics competently?”

Seventeen QSEN Informatics competencies are contained in one of three categories: knowledge (five competencies), skills (eight competencies), and attitudes (four competencies). Overall the participants reported that they were effectively prepared by their academic program in the QSEN informatics competencies to enter RN practice. Based on participants’ overall mean value they perceived greater academic preparation in their attitudes toward informatics ($M=5.00$, $SD=.91$). The collective mean value for knowledge of informatics was 4.46 ($SD=1.05$) and the lowest was skills preparation ($M=4.25$, $SD=.91$).

Research Question 1– Phase II Qualitative Findings

Interview participants in Phase II contributed valuable data to enhance the results of the survey data. The theme that surfaced from in the interview data for Research Question 1 was as follows: “Preparation in informatics in healthcare settings revolves around the electronic health record (EHR), and documentation, and protecting the patient information within the system.”

Participants in Phase II of the study voiced their opinion that students were not provided sufficient “hand-on” experience with EMRs. The participants all emphasized new nurses entering practice must have practical skills in working with EHRs.

Research Question 2- Phase I Quantitative Findings

Research Question 2 stated: How do recent BSN graduates perceive the importance of informatics competencies to their daily practice?

Results from the descriptive statistics strongly suggest that recent BSN graduates now working in healthcare settings appreciate the importance of informatics competencies in their

daily practice as RNs. Based on participants' overall mean value of their attitudes toward informatics and daily practice was high with a $M=5.36$ and $SD=.85$, this based on a six-point Likert scale. All three categories of informatics competencies (knowledge, skills, and attitudes) were rated as "very important" to the daily practice of RNs. For instance, when all three competency categories were combined for an overall average, the following results were found: $M=$ held by recent graduates perceived greater academic preparation in their attitudes toward informatics ($M=5.00$, $SD=.91$). The collective mean value for knowledge of informatics was 4.46 ($SD=1.05$) and the lowest was skills preparation ($M=4.25$, $SD=.91$).

Research Question 2- Phase II Qualitative Findings

One theme emerged from the interview data related to Research Question 2. This theme was "Applied experience with data documentation and computerized medical records [EHR] is necessary to guide safe practice and make clinical decision making as part of daily practice." All interview participants in Phase II reported the importance of electronic charting and EHR skills competencies for nursing practice regardless of the healthcare setting of employment. The theme that emerged from participants during this phase of the study was the importance of informatics application in practice as a means to provide safe care and guide decision making. Despite the importance and necessity of gained technology experience for healthcare settings, the participants reported importance for understanding the basic proficiency of paper charting in the event technology fails or the computer system is in downtime.

Research Question 3- Phase I Qualitative Findings

Research Question 3 posited: Which informatics competency areas do recent BSN graduates perceive as requiring more attention academically for the preparation of current nursing students to prepare them for nursing practice?

Survey data in Phase I described results from an open-ended question that asked about skills competencies that required more focus in the nursing program. Table 14 listed informatics skills that required more focus in the academic program. A sum of the top three related electronic medical record related informatics competencies comprised over half of the most recommended competencies. The three top informatics skills needing more focus in the nursing program were experience with electronic medical record (EMR) navigation, hands-on experience with different technology systems, and documentation, charting, and nurses' notes with legal implications.

Research Question 3- Phase II Qualitative Findings

Phase II interview provided a theme that emerged to enhance Phase I data. The theme that resulted from the interviews was the need to provide more hands-on experience with computerized documentation. Additional clinical experiences in nursing school clinical setting were thought to provide enhancement to learn informatics skills while in the program and subsequently prepare the graduate with improved competencies in the area of skill related technology use.

Discussion of Findings

This study represents empirical research that contributes to understanding how well graduates for one BSN nursing program perceived that the program prepared them for nursing practice with QSEN informatics competencies. Attention must be given to nursing programs to see that they are preparing students with required informatics competencies needed to provide the nursing profession with RNs who can provide safe and quality care. An article by Dyess and Sherman (2009) suggests "New nurses today often work in specialty settings with complex patients whose care requires high-level decision-making skill" (p. 408). With additional

complex nursing roles arises the understanding that healthcare facilities hire new graduates that “...are often selected for positions in high-acuity specialty areas” (p.408) that require extensive focus on “technology” (Dyess & Sherman, 2009, p. 408) supporting the need for increased academic technology application in nursing programs. Discussion of findings and conclusions were obtained from the study data are presented with each research question.

Research Question 1

The initial aim of for the study was to determine if graduates felt the academic program prepared them for nursing practice. Overall nursing graduates felt that the nursing program prepared them well for practice but indicated that more application experience with electronic health records and documentation would have been desired. As indicated by the results of the study and nursing literature a need exists to provide increased informatics skills to RNs prior to graduating from the nursing program. According to Saintsing et al. (2009) the need to expose nursing students to technology while in the academic program would decrease the number safety errors. The responsibly of the nursing programs to prepare students with experiences that enrich student technology is a necessity as healthcare technology evolves according to McBride (2005). Program would benefit from looking into the future of informatics and how implementation will impact all cohort levels for the nursing program and in particular the senior year of the nursing student. Understanding the need to provide additional hands-on experience with technology is recommended to provide nursing faculty with curriculum direction and course planning especially within the final courses in the program. The program thus far has offered more than acceptable learning experiences for graduating nurses.

Research Question 2

Another focus of the study was to ascertain BSN graduates perception of informatics use to their daily practice. The intent of this focus was to look at technology use in nursing practice experienced by RNs on a daily basis. Results from the study and nursing literature focus attention on the safety and quality of care. According to Cronenwett et al., (2007) QSEN the focus on informatics as one of six necessary competencies is significant to pre-licensure nursing programs as well as nursing practice. Understanding participants' perspective about informatics competencies most commonly used across their healthcare settings can serve to prepare nursing students in the nursing program clinical setting. Insight from program graduates expressed that all knowledge, skills, and attitudes were considered "very important" yet understanding what would be considered priority informatics competencies to gain proficiency can serve to guide curriculum to assess current practices. Data emerged that the participants' also felt the need to be prepared with knowledge of how to manage data when technology is not functioning. The use of downtime documents to support patient care data capturing was considered as a necessary skill to support technology in daily practice.

Research Question 3

The final goal of the study was to identify informatics competency areas graduate BSNs felt were most important to focus on while in the program. Opposing discussion to the research question was as presented to the participants to determine informatics competencies the participants believed the nursing program should decrease content in the curriculum. Study results suggest top areas of increased focus in the program yet report a significant number of participants suggest that no competencies be removed from informatics competency learning. While the graduates reported having varied technology exposure focus emerged that provided a

list of priority informatics technologies BSN nurse graduates felt were pertinent to their everyday practice experience. Graduates indicated need for more focus on electronic health records utilization and hands-on experience while students are still in the nursing program. Stakeholders who have worked diligently with QSEN competencies for pre-licensure curriculum have consulted healthcare and nursing organizations and practices standards to target the most critical informatics competencies (Cronenwett et al., 2007, Smith et al., 2007, Institute of Medicine, 2014).

A discussion of the findings presented the importance of assessing nursing program curriculum offerings in nursing informatics. Study findings revealed that BSN graduates reported being prepared by the BSN program yet would like additional technology application experiences that they feel will prepare future students better for nursing practice. Focus on electronic health records and computerized documentation lead participant data in study results in terms of technology competencies the participants would consider important to their current practice.

Limitations

Two limitations existed at the onset of this study. The first was that no current database existed at the nursing program for BSN graduates and the researcher had to use additional methods to try to reach the alumni. To increase the likelihood of making contact with alumni, the researcher used a college-based graduate degree list, the university alumni nursing association, and the newsfeed message route to known alumni in a private personal Facebook account. It is possible that with a lack of a current list of graduates and current email addresses that numerous students were unintentionally excluded from participation in the study.

Another limitation that surfaced as the study began was that the researcher had no way of knowing which graduates on the email list had passed the NCLEX licensure exam and became licensed RNs. Instructions included with the online survey and specific demographic/characteristic survey questions should have helped alleviate this limitation. Another evolving limitation was despite the college-generated graduate list of names and emails reported at the time of graduation, emails could have changed. The likelihood that target population was lower than previously indicated is a possibility lessening the opportunity exposure to nursing graduates of the program.

Recommendations for Future Research

Great concern exists for making sure that the academic preparation of students for practice as RNs and their knowledge, skills, and attitudes are appropriate. It is recommended that additional research be conducted on how successful academic programs are in preparing their graduates to meet the QSEN standards.

1. Examine perceptions of employers concerning the academic preparedness in informatics as BSN graduates transition from being a student to RN practitioner.

A need to understand employer perceptions and expectation of priority informatics competencies for new graduates would be significant information to share with academic programs to determine gaps in knowledge, skills, and attitudes.

2. Conduct similar studies on the other QSEN competency areas: “patient-centered care,” “teamwork and collaboration,” “evidenced-based practice,” “quality improvement,” and “safety.” In each of these competency areas, investigate academic preparation for practice.

Assessment of nursing curriculum would be crucial information to obtain to demonstrate preparedness of new graduates from practice in all QSEN Competency areas for the purpose of ensuring competency content in program and curriculum course outcomes.

3. Since this present study only involved one BSN program, a similar study should be conducted using a national sample of recent BSN graduates
4. Investigate health care employer and nursing faculty academic collaboration with QSEN competencies on how best to close the gap from student to practitioner in each QSEN competency area.
5. Additional research could focus on the effectiveness of health care institutions' new nurse orientation to see if these programs effectively enhance QSEN informatics competency acquisition.

Follow-up assessment of nursing informatics experiences with new graduates may serve to identify additional areas in BSN nurse experiences that may not have been considered as BSN nurses evolve into leadership and evidence-based practice responsibilities.

6. Conduct a follow-up research study within five years to observe if the addition of simulation lab technology helps improve student preparedness in informatics knowledge, skills, and attitudes.

A retrospective study would give an overview of technological changes and how the BSN has managed to keep up with rapidly changing healthcare informatics. Additionally, observations to determine the role that simulation lab experiences contribute to preparedness of new BSN graduates for practice and clinical experiences can be visited.

Recommendation for Improved Practice

1. Review current program curriculum to identify opportunities to integrate informatics competencies in courses across the BSN program continuum.

Review of current academic program curriculum will identify any gaps in learning and provide nursing faculty with a plan to align informatics competencies across course levels to ensure competent BSN graduates.

2. Update nursing program faculty about QSEN competency changes and recommendations for the academic setting.

Education about the QSEN Initiative and focus for all nursing faculty to learn goals for all QSEN six competency areas will ensure that faculty are intentional about including content and experiences across program courses.

3. Investigate the nursing program curriculum after the first year to identify student perception of experience with informatics knowledge, skills, and attitudes.

The significant of formative evaluation of nursing program course content across all courses would determine if students are receiving the content listed in course and program outcomes. While this study was focused on determining what the program has provided throughout the experience of graduates, the program would benefit from taking a proactive approach to ensure that informatics competencies exist in the foundational semesters of learning in the nursing program.

Summary

This study examined new BSN nurse perceptions of academic preparedness for practice based on the QSEN informatics competencies. A list of 17 knowledge, skills, and attitude competencies factors were explored to determine how the new nurses perceived the program academic was effective in preparing for practice. The same competencies were investigated to determine the importance of the competencies the participant first employment experience in practice. Additional inquiry into new nurse orientation and prior experience with health technology employment were also examined to gain further insight into the additional influences.

Preparedness for practice was the responsibility of all stakeholders involved with nursing student to new nurse transition into practice. Both nursing students and nursing educators are mutually responsible for offering opportunity and actively learning in an environment that best simulates the real-world healthcare environment. While not every hands-on skill or technology application can be offered mutually to each nursing student, the knowledge and attitudes required to continue into practice will prepare the new nurse with the confidence needed to practice in any environment regardless of the technology available in their new practice role. Outcomes for inclusion of QSEN competencies in the nursing program have demonstrated that graduates perceive that they are meeting outcomes to improve overall patient quality and safety in practice.

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Appendix A

QSEN Informatics Competencies

INFORMATICS		
Definition: Use information and technology to communicate, manage knowledge, mitigate error, and support decision making.		
Knowledge	Skills	Attitudes
Explain why information and technology skills are essential for safe patient care	<p>Seek education about how information is managed in care settings before providing care</p> <p>Apply technology and information management tools to support safe processes of care</p>	Appreciate the necessity for all health professionals to seek lifelong, continuous learning of information technology skills
<p>Identify essential information that must be available in a common database to support patient care</p> <p>Contrast benefits and limitations of different communication technologies and their impact on safety and quality</p>	<p>Navigate the electronic health record</p> <p>Document and plan patient care in an electronic health record</p> <p>Employ communication technologies to coordinate care for patients</p>	<p>Value technologies that support clinical decision-making, error prevention, and care coordination</p> <p>Protect confidentiality of protected health information in electronic health records</p>
<p>Describe examples of how technology and information management are related to the quality and safety of patient care</p> <p>Recognize the time, effort, and skill required for computers, databases and other technologies to become reliable and effective tools for patient care</p>	<p>Respond appropriately to clinical decision-making supports and alerts</p> <p>Use information management tools to monitor outcomes of care processes</p> <p>Use high quality electronic sources of healthcare information</p>	Value nurses' involvement in design, selection, implementation, and evaluation of information technologies to support patient care

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Appendix B

Informed Consent and Survey Instrument

"New BSN Nurses' Perceptions of their Academic Preparedness for Practice Based on QSEN Informatics Competencies"

Consent to Participate in a Research Study-Survey

Principal Researcher: Teri Montgomery

Faculty Advisor: Dr. John Murry

You are invited to participate in a dissertation research study entitled ***“New BSN Nurses’ Perceptions of their Academic Preparedness for Practice Based on QSEN Informatics Competencies”***, which is being conducted by Ms. Teri Montgomery (EMSON, Nursing Department; Principal Researcher and HIED Doctoral Candidate, University of Arkansas) and supervised by Dr. John Murry (HIED Faculty Advisor, RHRC, Higher Education, University of Arkansas).

The purpose of this study is to gain an understanding of new BSN nurses’ perceptions of their academic preparedness for practice based on the QSEN informatics competencies of knowledge, skills, and attitudes. You are being asked to participate in this study because you are alumni of the University of Arkansas BSN program. Most important are your perceptions about informatics competencies you obtained in your nursing degree program at the University of Arkansas and how your feedback may benefit future program outcomes.

Your voluntary participation will involve answering questions on an online survey about your academic preparedness of informatics competencies and how you perceive that the preparation relates to your current practice. Completing the online survey should last approximately 10-15 minutes. There are no right or wrong answers. At the conclusion of the survey you will be asked for additional willingness to participate in a voluntarily audio-recorded interview that should last approximately 30-60 minutes. Personal identifying information will only be asked to make contact with participants who wish to participate in the interview. Participants who are chosen for the interview will be notified by email within two weeks after completion of the online survey. Additional follow-up questions may be requested, if I deem that we need to clarify any of your responses.

Your involvement in the study is voluntary. If you do not want to be in this study, you may refuse to participate. Also, you may refuse to participate at any time during the study. Your relationship with the University will not be affected in any way if you refuse to participate. There is no cost associated with your participation and no compensation. For your participation, you

may receive a descriptive summary of the results by formally requesting this information from the principal researcher.

There are no known risks or discomforts associated with this research. Your participation in this study will be kept confidential to the extent allowed by law and University policy. No individually identifying information about you will be shared with others outside of this study, unless you expressly permit the principal researcher to do so, or as required by law. However, you should understand that as with most communications over the Internet, there is a limit to the confidentiality that can be guaranteed due to the Internet technology itself; hence, there is some risk that your responses may not be completely secured. Once your completed survey is received and downloaded to my computer, I will follow standard confidentiality procedures. I will present data from the study in aggregate form and, therefore, none of your individual responses will be presented and you will not be identified in the discussion of results. Secondary data regarding your academic performance (e.g., GPA, course grades) will be obtained as a part of this study. If you have any questions about this research project, please feel free to contact Principal Researcher Ms. Teri Montgomery (Nursing Department, the University of Arkansas, 479-xxx-xxxx) or Faculty Advisor Dr. John Murry (RHRC, Higher Education, the University of Arkansas, 479-575-3082). Questions or concerns about your rights as a research participant should be directed to The Chairperson, University of Arkansas Institutional Review Board, 210 Administration, Fayetteville, Arkansas 72701-1201; telephone (479) 575-2208; email address irb@uark.edu .

I have read the above information and have been able to ask questions and express concerns, which have been satisfactorily responded to by the investigator. I understand the purpose of the study as well as the potential benefits and risks that are involved. I understand that participation is voluntary. I understand that significant new findings developed during this research will be shared with the participant. I understand that no rights have been waived by signing the consent form. Please print this for your own records. I also have the option to email the principal researcher for a copy of this consent form if I so choose.

Question 1:

- I agree
- I do not agree

Please click on the response that best answers the question

Question 2: Overall, how would you rate the IMPORTANCE of your Informatics KNOWLEDGE acquisition as it relates to usage in current nursing practice?

	Not at all Important	Very Unimportant	Somewhat Unimportant	Somewhat Important	Very Important	Extremely Important
Explain why information and technology skills are essential for safe patient care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Identify essential information that must be available in a common database to support patient care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Contrast benefits and limitations of different communication technologies and their impact on safety and quality.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Describe examples of how technology and information management are related to the quality and safety of patient care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recognize the time, effort, and skill required for computers, databases, and other technologies to become reliable and effective tools for patient care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Question 3: Overall, how would you rate the IMPORTANCE of your Informatics SKILLS acquisition as it relates to usage in current nursing practice?

	Not at all Important	Very Unimportant	Somewhat Unimportant	Somewhat Important	Very Important	Extremely Important
Seek education about how information is managed in care settings before providing care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Apply technology and information management tools to support safe processes of care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Navigate the electronic health record.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Document and plan patient care in and electronic health record	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Employ communication technologies to coordinate care for patients.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Respond appropriately to clinical decision-making supports and alerts.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use information management tools to monitor outcomes of care processes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Not at all Important	Very Unimportant	Somewhat Unimportant	Somewhat Important	Very Important	Extremely Important
Use high quality electronic sources of healthcare information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Question 4: Overall, how would you rate the IMPORTANCE of your Informatics ATTITUDE acquisition as it relates to usage in current nursing practice?

	Not at all important	Very unimportant	Somewhat unimportant	Somewhat Important	Very important	Extremely important
Appreciate the necessity for all health professionals to seek lifelong, continuous learning of information technology skills.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Value technologies that support clinical decision making, error prevention, and care coordination.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protect confidentiality of protected health information in electronic health records.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Not at all important	Very unimportant	Somewhat unimportant	Somewhat Important	Very important	Extremely important
Value nurses' involvement in design, selection, implementation, and evaluation of information technologies to support patient care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Question 5: Overall, how effective was your nursing program in PREPARING you for the following Informatics KNOWLEDGE competencies?

	Very Ineffective	Ineffective	Somewhat Ineffective	Somewhat Effective	Effective	Very Effective
Explain why information and technology skills are essential for safe patient care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Identify essential information that must be available in a common database to support patient care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Contrast benefits and limitations of different communication technologies and their impact on safety and quality.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Describe examples of how technology and information management are related to the quality and safety of patient care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Very Ineffective	Ineffective	Somewhat Ineffective	Somewhat Effective	Effective	Very Effective
Recognize the time, effort, and skill required for computers, databases, and other technologies to become reliable and effective tools for patient care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Question 6: Overall, how effective was your nursing program in PREPARING you for the following Informatics SKILLS competencies?

	Very Ineffective	Ineffective	Somewhat Ineffective	Somewhat Effective	Effective	Very Effective
Seek education about how information is managed in care settings before providing care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Apply technology and information management tools to support safe processes of care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Navigate the electronic health record.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Document and plan patient care in and electronic health record.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Employ communication technologies to coordinate care for patients.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Respond appropriately to clinical decision-making supports and alerts.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Very Ineffective	Ineffective	Somewhat Ineffective	Somewhat Effective	Effective	Very Effective
Use information management tools to monitor outcomes of care processes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use high quality electronic sources of healthcare information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Question 7: Overall, how effective was your nursing program in PREPARING you for the following Informatics ATTITUDE competencies?

	Very Ineffective	Ineffective	Somewhat Ineffective	Somewhat Effective	Effective	Very Effective
Appreciate the necessity for all health professionals to seek lifelong, continuous learning of information technology skills.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Value technologies that support clinical decision making, error prevention, and care coordination.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protect confidentiality of protected health information in electronic health records.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Value nurses' involvement in design, selection, implementation, and evaluation of information technologies to support patient care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Question 8: Did you have work experience with healthcare technologies prior to entering the nursing program?

- Yes
- No

Question 9: If you answered yes to question 8, explain the healthcare experience and associated technologies.

Question 10: Which informatics skills competencies should receive MORE CURRICULUM FOCUS in the academic setting that are most important to your current practice setting experience?

Question 11: Which informatics skills competencies should receive LESS CURRICULUM FOCUS in the academic setting as compared to your current practice setting experience?

Question 12: What is your gender?

- Male
- Female

Question 13: What is your age?

- 18 to 24
- 25 to 34
- 35 to 44
- 45 to 54
- 55 to 64
- 65 or older

Question 14: What level did you enter the BSN program?

- Generic BSN (no previous RN nursing education)
- Transfer Nursing Student (received some competencies from another RN program)
- RN to BSN (licensed nurse returning to obtain BSN degree)

Question 15: Year BSN completed?

- 2013
- 2012
- 2011
- 2010
- 2009

- 2008
- 2007

Question 16: What type of facility were you first employed after receiving your BSN degree and licensure?

- Hospital
- Clinic
- Outpatient facility
- Long term care
- Other

Question 17: Did your first healthcare facility employer provide a new nurse orientation?

- Yes
- No

Question 18: Referring to question 17, give examples of informatics competencies that were first introduced during the new nurse orientation?

Question 19: How many nursing positions have you held since your licensure?

- 1
- 2
- 3
- Other, please specify

Question 20: Please select a response

Would you be willing to participate in an additional face-to-face or telephone interview? The interview questions will be directed at answering additional questions and experiences related to your informatics experience at the completion of your BSN degree (I will travel to a location that is convenient to you or contact you at a time that is most convenient for a 30-60 minute uninterrupted conversation.)

- Yes
- No

Question 21: You have been directed here because you chose “Yes” to question 20. Please provide contact name, email, and phone number

Name:

Email address:

Phone number:

Please double-check your information before submitting. Thank you

Appendix C

Initial Email Letter to Participate in Survey

Dear University of Arkansas EMSON Nursing Alumni,

I am a Doctorate Candidate for the Doctor of Higher Education (EdD) Program at the University of Arkansas. I am beginning my initial inquiry using the Qualtrics online survey. This survey will be used as a means to further explore my area of interest for the purpose of degree requirements of dissertation completion.

The purpose of the linked survey is to help better understand new BSN nurse perceptions of preparedness for informatics competencies during their academic program. You have been selected as a potential participant based on your nursing school alumni status and length of time since degree completion at the University of Arkansas.

The survey can be found at this link. The initial page of the survey will contain a consent form explaining your participation in the study. Click on the hyperlink to open the survey or copy and paste to your URL:

http://uark.qualtrics.com/SE/?SID=SV_8dCKljktyiTNg9

Your participation is completely voluntary and will be kept confidential to the extent allowed by law and University policy. Your relationship with the University will not be affected in any way if you refuse to participate. While I understand how valuable your time is, I greatly appreciate your participation in the survey. Your responses will help provide valuable feedback to the University of Arkansas BSN nursing program.

At the conclusion of the survey you will be asked if you chose to further participate in an interview with the Principal Researcher to elaborate on the same research topic. The interview will occur face-to-face. Your involvement for this portion of the study is also voluntary.

You have the right to contact the Principal Researcher or Faculty Advisor as listed below for any concerns that you may have. Principal Researcher-Teri Montgomery, xxxxx@uark.edu at 479-xxx-xxxx; Faculty Advisor-Dr. John Murry, jmurry@uark.edu at 479-575-3082

You may also contact the University of Arkansas Research Compliance office listed below if you have questions about your rights as a participant, or to discuss any concerns about, or problems with the research. Ro Windwalker, CIP Institutional Review Board Coordinator, Research Compliance, University of Arkansas, 210 Administration, Fayetteville, AR 72701-1201, 479-575-2208, irb@uark.edu

NOTE: Several methods of emailing have been utilized. You may receive a mailing from the Arkansas Alumni Association and one from me. Please only take the survey one (1) time to prevent duplicate reporting.

Thank you, Teri Montgomery

Appendix D

Field Pilot of Survey Responses

	RN1	RN2	RN3	RN4	RN5	RN6
<i>Question clarity:</i> Were the questions clear? If no, please elaborate.	I felt as though the questions were clear.	Yes, questions were clear and concise. Easy to understand and interpret.	The questions flowed together	I believe so.	I found the questions to be clearly stated.	Yes, excellent. I consider it to be a clear and concise survey.
<i>Flow of the survey:</i> Do the questions make sense in the order that they appear?	The questions flowed good. I liked all the questions the same options to respond were all together. Makes it easy to respond quickly.	Yes, the questions make sense in the order they appear. The Likert Scale is appropriate for this survey.	Questions were clear easy to understand.	Yes	The flow of the questions is logical.	Yes, absolutely
<i>Survey length:</i> Were you pleased with the length of the survey? If no, please elaborate	The length was acceptable not long at all.	Yes, the length of the survey was appropriate in length.	Yes, the length was adequate and the questions were appropriate for this type of study.	Yes, it didn't seem too long.	The survey is relatively brief and easy completed in 5-10 min.	Yes the length was appropriate.
<i>Study expectations:</i> Are there questions what you expected	They seem accurate and appropriate to the topic.	The questions in the survey were related to the topic of the study. Not	No response	Sure, I didn't have any expectation of this study.	The questions were pertinent to the stated purpose of the	No response

<p>to see based on the purpose of the study? If not, what other questions were you expecting to find?</p> <p><i>Other:</i> Any additional feedback?</p>	None	<p>all questions were expected but they were appropriate for this survey.</p> <p>Overall, this survey serves as a well-rounded assessment tool of recent BSN graduates perceptions of academic preparedness related to competencies gained in informatics. I appreciate the Likert Scale used in the survey and found the survey easy to navigate and comprehend. The survey itself is visually pleasing and reflects strong planning and organization.</p>	None	I personally don't like the blank areas to fill in. In many surveys, I would typically leave that blank. Perhaps providing option to pick and then maybe the other option with fill in blank.	<p>study.</p> <p>The survey is well written and thoughtful.</p>	Did not see any duplication of questions and felt the questions were of the quality that can be used to assess student perception of their education experience.
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Appendix F

Final Email Letter to Participate in the Online Survey

Dear University of Arkansas EMSON Nursing Alumni,

I want to begin by thanking those of you who have already participated. Your feedback will be of great value. This will be the last time you receive the email so I wanted to give you the deadline date of Wednesday, August 21 to complete if you wish your feedback to be included. Remember to only complete the survey one time. The survey is anonymous so I do not know who has completed the survey unless you have chosen to take part in the interview. A random draw will determine who will be selected to interview.

I am a Doctorate Candidate for the Doctor of Higher Education (EdD) Program at the University of Arkansas. I am beginning my initial inquiry using the Qualtrics online survey. This survey will be used as a means to further explore my area of interest for the purpose of degree requirements of dissertation completion.

The purpose of the linked survey is to help better *understand new BSN nurse perceptions of preparedness for informatics competencies during their academic program*. You have been selected as a potential participant based on your nursing school alumni status and length of time since degree completion at the University of Arkansas.

The survey can be found at this link. The initial page of the survey will contain a consent form explaining your participation in the study. Click on the hyperlink to open the survey **or** copy and paste to your URL:

http://uark.qualtrics.com/SE/?SID=SV_8dCKIjlktyiTNg9

Your participation is completely voluntary and will be kept confidential to the extent allowed by law and University policy. Your relationship with the University will not be affected in any way if you refuse to participate. While I understand how valuable your time is, I greatly appreciate your participation in the survey. Your responses will help provide valuable feedback to the University of Arkansas BSN nursing program.

At the conclusion of the survey you will be asked if you chose to further participate in an interview with the Principal Researcher to elaborate on the same research topic. The interview will occur by phone call, Facetime®, or face-to-face. Your involvement for this portion of the study is also voluntary. A random draw will determine who will be selected to interview.

You have the right to contact the Principal Researcher or Faculty Advisor as listed below for any concerns that you may have. Principal Researcher-Teri Montgomery, xxxxx@uark.edu at 479-xxx-xxxx; Faculty Advisor-Dr. John Murry, jmurry@uark.edu at 479-575-3082

You may also contact the University of Arkansas Research Compliance office listed below if you have questions about your rights as a participant, or to discuss any concerns about, or problems with the research. Ro Windwalker, CIP Institutional Review Board Coordinator, Research Compliance, University of Arkansas, 210 Administration, Fayetteville, AR 72701-1201, 479-575-2208, irb@uark.edu

NOTE: Several methods of emailing have been utilized. You may receive a mailing from the Arkansas Alumni Association and one from me. Reminder: Please only take the survey one (1) time to prevent duplicate reporting. Thank you ☺

Sincerely,

Teri Montgomery, MNsc, RN
Doctoral Candidate, EdD
Higher Education
University of Arkansas

Appendix G

Consent to Participate in a Research Study-Interview

"New BSN Nurses' Perceptions of their Academic Preparedness for Practice Based on QSEN Informatics Competencies"

Principal Researcher: Teri Montgomery

Faculty Advisor: Dr. John Murry

You are invited to participate in a dissertation research study entitled "New BSN Nurses' Perceptions of their Academic Preparedness for Practice Based on QSEN Informatics Competencies," which is being conducted by Ms. Teri Montgomery (EMSON, Nursing Department; Principal Researcher and HIED Doctoral Candidate, University of Arkansas) and supervised by Dr. John Murry (HIED Faculty Advisor, RHRC, Higher Education, University of Arkansas).

The purpose of this study is to gain an understanding of new BSN nurses' perceptions of their academic preparedness for practice based on the QSEN informatics competencies of knowledge, skills, and attitudes. You are being asked to participate in this study because you are alumni of the University of Arkansas BSN program. Most important are your perceptions about informatics competencies you obtained in your nursing degree program at the University of Arkansas and how your feedback may benefit future program outcomes.

Your voluntary participation will involve participation in an audio-recorded interview that should last approximately 30-60 minutes. The interview questions will further elaborate on your academic preparedness of informatics competencies and how you perceive that the preparation relates to your current practice. There are no right or wrong answers. Additional follow-up questions may be requested, if I deem that we need to clarify any of your responses. The interview will occur face-to-face. An audio recording device will be used to capture the conversation. Note-taking will also occur during the interview.

Your involvement in the study is voluntary, and you may choose not to participate or to stop at any time without penalty or loss of benefits to which you are otherwise entitled. There is no cost associated with your participation and no compensation. For your participation, you may receive a descriptive summary of the results by formally requesting this information from the principal researcher.

There are no known risks or discomforts associated with this research. Your participation in this study will be kept confidential to the extent allowed by law and University policy. No individually identifying information about you will be shared with others outside of this study, unless you expressly permit the principal researcher to do so, or as required by law. Once the interview data is received and downloaded to my computer, I will follow standard confidentiality

procedures. I will present data from the study in aggregate form and, therefore, none of your individual responses will be presented and you will not be identified in the discussion of results. Secondary data regarding your academic performance (e.g., GPA, course grades) will be obtained as a part of this study.

If you have any questions about this research project, please feel free to contact Principal Researcher Ms. Teri Montgomery (Nursing Department, the University of Arkansas, 479-xxx-xxxx) or Faculty Advisor Dr. John Murry (RHRC, Higher Education, the University of Arkansas, 479-575-3082). Questions or concerns about your rights as a research participant should be directed to The Chairperson, University of Arkansas Institutional Review Board, 210 Administration, Fayetteville, Arkansas 72701-1201; telephone (479) 575-2208; email address irb@uark.edu .

I have read the above statement and have been able to ask questions and express concerns, which have been satisfactorily responded to by the investigator. I understand the purpose of the study as well as the potential benefits and risks that are involved. I understand that participation is voluntary. I understand that significant new findings developed during this research will be shared with the participant. I understand that no rights have been waived by signing the consent form. I have been given a copy of the consent form.

Sign name here _____

Appendix H

Final Interview Guide

The main purpose of this interview is to learn about informatics competencies from your perspective. The following questions are the types of questions that will be asked during the interview. They are being provided ahead of time to give you time to reflect on your responses.

1. Answer the follow about your current practice:
 - a. What are your previous experiences with healthcare informatics before or during nursing school?
 - b. What years did you attend the nursing program?
 - c. How long have you been working in nursing practice as a licensed registered nurse?
 - d. What type of facility do you currently work?
 - e. What type of practice specialty area do you work?
 - f. What are some examples of informatics competencies that were introduce during new nurse orientation?
 - g. What type of informatics do you utilize in your current role?

2. How has working with healthcare informatics enhanced... (Please provide some examples or experiences with each question)
 - a. the way you perform your job?
 - b. the way you communicate with healthcare providers?
 - c. the way you collaborate with your colleagues?
 - d. the way you communicate with patients/clients?
 - e. the way you provide education to patients/clients?
 - f. the way you receive continuing education?

3. During the transition from the academic program to current nursing practice, what types of informatics competency adjustments in learning had to be made? Please provide some examples or stories.

4. How have healthcare technologies changed since informatics was introduced in the academic setting as compared to your current place of employment in nursing practice? Please provide some examples or stories.

5. What values did you learn in the academic setting that you took into the nursing practice setting and did your academic values differ from the practice setting?

6. Give examples of how your nursing program provided you with knowledge of informatics and healthcare technologies in the ever-changing state of U.S. healthcare?

7. How did your academic program prepare you as an advocate for change through the constant evolving of healthcare informatics technology and regulations?
8. Please share your thoughts regarding the advantages and disadvantages of healthcare technology in your current practice.
9. Please share any additional comments or stories about the way healthcare informatics has or will influence changes within your organization and /or academic pursuit.
10. Give examples of informatics technologies that you utilize in your current practice.

Appendix I

IRB Protocol Approval Letter



Office of Research Compliance
Institutional Review Board

June 14, 2013

MEMORANDUM

TO: Teri Montgomery
John Murry

FROM: Ro Windwalker
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 13-06-736

Protocol Title: *New BSN Nurses' Perceptions of their Academic Preparedness for Practice Based on QSEN Informatics Competencies*

Review Type: EXEMPT EXPEDITED FULL IRB

Approved Project Period: Start Date: 06/14/2013 Expiration Date: 06/13/2014

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (<http://vpred.uark.edu/210.php>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 405 participants. If you wish to make any modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or irb@uark.edu.

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