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Faculty Perspectives on Effective Integration of Simulation into a Baccalaureate Nursing Curriculum

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COLLEGE OF EDUCATION

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MSN, Webster University, 2006

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Doctoral Study Submitted in Partial Fulfillment

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Abstract

Research shows that use of high fidelity simulation (HFS) as a teaching strategy requires extensive amounts of faculty time and financial resources for faculty development and equipment. This project study addressed the challenges encountered in the integration of HFS into a Midwestern metropolitan baccalaureate nursing program. The purpose of this qualitative case study was to explore perceptions of nursing faculty about best practice elements for successful integration of HFS into undergraduate nursing programs. Guiding questions were developed using Donabedian's structure-process-outcome model and focused on faculty perceptions related to successful implementation of simulation in their programs. Purposeful sampling was used to select 22 faculty who had integrated HFS into 5 regional baccalaureate nursing programs in metropolitan areas of 2 Midwestern states. Nine participants completed an online interview tool developed by the researcher and designed to elicit responses to open-ended questions about barriers encountered, methods used to overcome those barriers, first impressions about conducting HFS, perceptions of successful integration, and incentives to using HFS. Data were coded and analyzed to identify themes. Emergent themes included the need to identify specific courses for HFS, ensure participation of faculty teaching didactic courses, use nationally recognized principles for HFS implementation, implement consistent methods of debriefing, and use formal written plans. Findings from the study were used to design a staff development initiative to facilitate planning and establishment of HFS in a nursing curriculum. Positive social change may occur when faculty and administrators use project guidelines to develop sound practices for integrating HFS into the nursing curriculum.

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Dedication

This project is dedicated to my husband, children, and friends who have continued through this long process to encourage and support me. I want to show my children, grandchildren, and great-grandchildren the results of perseverance and hard work, no matter your age.

Acknowledgments

I wish to thank my husband, for his support and for the many meals and housekeeping chores he took over so that I could finish my dream. I want to thank my friends and coworkers who have supported and encouraged me, offered to help if needed, been supportive when I wanted to quit, and pushed me forward. I want to thank my children, who although miles away and not really involved in the day-to-day trials, have shown support and encouragement through this long process. This has been a long and arduous journey for everyone, and I sincerely appreciate your unending support and encouragement at times when things seemed hopeless and overwhelming. I also want to thank my committee chair for standing with me and providing encouragement, guidance, and advice as we experienced this journey together.

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Section 1: The Problem

Introduction

There have been numerous calls to change the way nurses are educated due to the need for more nurses, the need for more nursing faculty, and the need for patient safety (American Association of Colleges of Nursing, 2014; Institute of Medicine, 2011; National League for Nursing, 2003; National League for Nursing, 2011; & United States Department of Health and Human Services, 2010). As noted by Benner, Sutphen, Leonard, and Day (2009), "Profound changes in science, technology, patient activism, the market-driven health care environment, and the nature and settings of nursing practice have all radically transformed nursing practice since the last national nursing education study, almost forty years ago" (p.1). The authors recommended several changes to the teaching of nurses, such as teaching nursing students to use science and knowledge, knowledge to deal with abnormal findings in practice, and how to use their scientific knowledge in the clinical arena to determine patient needs in a given situation.

Murray (2013) investigated numerous ways in which nursing programs have addressed the inclusion of technology. Some of these resources include (a) simulation, which includes low, moderate, and high fidelity; (b) virtual clinical experiences, which give a three-dimensional view of the clinical environment making it a believable experience for students; (c) virtual reality environments such as Second life; and (d) actual computerized health care records used in the clinical setting or in the simulation laboratory. Another type of technological addition is a virtual practicum, conducted in real time, with a preceptor in a different geographical region. The findings of Murray's

study determined that nursing has indeed implemented the suggestions of Benner et al. (2009) relating to needed changes in nursing education.

High fidelity simulators (HFS) have become an emerging teaching tool for providing real life clinical instruction in many nursing programs across the nation. This teaching tool, in many cases, has been implemented into nursing programs with little planning, education of faculty, or reduction in faculty teaching load (Seropian, Brown, Gavilanes, & Driggers, 2004). This was the situation in the local baccalaureate nursing program, the site of this study, where faculty and administration were struggling to identify best practices for integration of simulation into the nursing curriculum.

Definition of the Problem

The use of HFS in today's nursing curriculum is considered a beneficial teaching strategy and is being adopted throughout the world. At the time of the study, the nursing baccalaureate program at this Midwestern university in the United States was an accelerated program, completed in 18 months, and admitted approximately 50 students each summer. Vendor training was offered to all faculty for the simulators in the spring of 2010 when the simulators were purchased, but not all current faculty were able to attend. The use of HFS began in the fall of 2010 and simulated experiences now occur in four of the 19 courses of the curriculum. Two full-time faculty are each allocated less than one-fourth of their full-time workload to programming and facilitating simulated experiences.

In 2009, administrators at the Midwestern university nursing program received a grant from Health Resources and Services Administration (HRSA) to purchase simulators

for teaching clinical skills to students. Administrators purchased one Laerdal Medical simulator (Sim Man) and two Gaumard simulators (Noelle with newborn HAL, and PEDI Blue), which were delivered to the school in the spring of 2010. The faculty had very little experience with simulation, and no one on the faculty was given a full-time workload focused on simulation to be able to get the system up and running. The expectation was for two full-time faculty members to be given a minimal amount of points from their full-time faculty workload toward programming the simulator and conducting the simulated scenario with assistance from the course lead faculty.

Training was provided in May 2010 for all faculty on the operation of the Laerdal equipment and setting up scenarios for students. This training was provided at the end of spring classes, just prior to summer break. During the summer months faculty on campus (which is very few) teach a full semester course over a condensed 7-week timeframe. Thus, there were no faculty employed in the summer who were able to work on simulation scenarios needed to begin the fall semester. Construction of the simulation lab began in the summer of 2010, and the faculty member teaching a full load for the summer was available to work with contractors in the construction of the lab.

The simulation experience that began in the fall semester of 2010 was new to the students and faculty. The senior students were beginning clinical experiences in critical care and faculty wanted them to implement simulation scenarios to help them feel confident about doing cardiopulmonary resuscitation (CPR) and caring for a patient who is not responding to medical care (i.e., decompensating). Learning objectives had been developed for the scenario as well as preparatory student reading and assignments which

were provided to the students a few days prior to the simulation experience. Faculty had not had the time or resources to prepare for teaching simulation and setting up scenarios. They also quickly realized the need for more structure in the scenarios. Although students stated they were more confident after the simulation experience, faculty saw a need to develop the scenarios in more depth, such as writing the scenario with a defined list of roles for students. Faculty also experienced problems in having the equipment needed for the simulation identified, ordered, and ready for use (such as an aerosol mask for respiratory treatments; medication administration machine up and running; labeled medications; and a complete chart for the scenario with lab reports, physician orders, medication administration records, etc.). These problems related back to inadequate time and faculty training in using simulation.

Specific factors, such as time, are necessary in the implementation of new teaching strategies, and especially in regard to simulation. Faculty need release time to determine how best to use simulation in meeting the objectives of the course. Adding simulation as a teaching strategy requires careful planning. Simulation is usually housed in a lab with a control room consisting of computers, cameras, audio equipment, and is behind a one-way mirror that allows the faculty to monitor the actions of the student during a simulated experience (Seropian, 2003). A participant at a conference I attended described her experience of entering the control room as being like “climbing into a cockpit and being told to figure it out”.

Vendor-provided education is specific to the simulator purchased from that particular vendor and does not include other products or simulation scenarios. Although

the vendor may provide training, the importance of timing is often overlooked. Vendor-provided training usually occurs soon after the shipment of the simulators to allow faculty to use the simulators as soon as possible (Adamson, 2010). It may be several weeks or months after training is provided to faculty before actual simulated experiences are developed or conducted. Gantt (2013) acknowledged the fact that resources for training the simulator operator or faculty member are not readily available. The lab at this particular facility had not yet been remodeled to accommodate simulation at the time the vendor provided faculty training, and therefore, the simulators were not immediately used.

The simulated scenarios that have been conducted beginning in 2010 to the present time include respiratory distress requiring CPR and intubation, a deteriorating patient with a myocardial infarction, care of a patient with reaction to blood transfusion, birth of an infant, and postpartum hemorrhage. In some cases, it was possible to purchase a scenario and alter it to accommodate simulation needs. In other situations, the complete scenario had to be written and programmed into the simulator, for which few of the faculty had been trained. The extensive time needed to develop these scenarios serves as a barrier to use of simulation. In spite of the difficulty of implementing simulation into the university's nursing program and although formal evaluation was not carried out for all scenarios, students stated in obstetrical simulation evaluations that they had more confidence after going through the simulated experiences.

The current program at the time of the study that began in the fall of 2013 admitted 50–51 students annually to an accelerated 18 month program. Appendix B

contains a description of the simulated experiences in the 18-month curriculum. Faculty had hopes of increasing the current simulated experiences in critical care, half of medical-surgical care, and obstetrical nursing courses, with the addition of simulated scenarios in psychiatric nursing courses, fundamentals coursework, health assessment, as well as taking the simulator to the pharmacology didactic classroom. Since only two faculty members are given partial work load points for simulation, the addition of simulated experiences and increased student numbers would place added strain on the current faculty. Issues related to lack of faculty training, time allocation to develop scenarios, and working around the teaching load of the two faculty members overseeing the simulation laboratory, coupled with no additional points for the two faculty members doing simulation would result in further stress in an already stressful situation.

The scheduling of courses, simulation, and clinical experiences in the current 18-month curriculum makes the addition of more simulation experiences difficult to manage. The correlation of simulation to the timeframe of the two coordinators adds to the difficulty of scheduling or adding new simulated experiences to courses currently in the curriculum. The fact that current faculty lack several necessary components to fully integrate simulated experiences into the 18-month accelerated program is also a deterrent. These components include experience using simulation, budgetary resources to support further faculty training, and a lack of time necessary to accomplish training and develop student experiences in simulation.

Rationale

Evidence of the Problem at the Local Level

The implementation of the 2008 Bachelor of Science in Nursing (BSN) Essentials from the American Association of Colleges of Nursing (AACN) caused the school of nursing under study to determine a need to restructure the nursing curriculum. With this restructure, came the addition of the HFS experience. The school of nursing had written a grant application, received funding, purchased the simulators, and begun the construction of the lab in the summer of 2010. At that time, the faculty voiced concerns related to integrating the new curriculum and simulation into a workable program for students and faculty. Several area nursing programs had procured simulation and integrated it successfully into their nursing curriculum.

The new curriculum that began in the fall of 2013 emphasized obstacles already identified such as time to run simulations, release time, support, and appropriate numbers of staff members. Since then, the program has facilitated the use of simulation experiences in more courses and with larger numbers of students per course in a small amount of time. At the time of the study, the university has no pediatric simulator and would benefit from a fourth simulator. With only one patient care area, not large enough to accommodate two simulation scenarios at one time, space for integration of simulation is limited.

Exploration of the local problem suggested that there was an important gap in practice between what was known about the advantages of using HFS in nursing education programs (outcomes) and the actual effective implementation of this teaching

strategy into nursing curricula (structure and process). This gap in practice appeared to be related to a variety of factors, especially faculty inexperience with HFS and time constraints for the development and implementation of simulated scenarios. It was important to know other factors that may serve as facilitators and barriers in the use of HFS for nursing students, as well as how faculty conceives of best practices for integrating this teaching strategy into their workload.

The increasing number of nursing programs using simulation affords the opportunities of studying the integration of simulation, which had not occurred to this point. Adamson (2010) stated "Anecdotal evidence indicates that although many nursing programs are investing hundreds of thousands of dollars in human patient simulation (HPS) equipment, this valuable resource is often not being used to its full potential" (p. e75). Thompson (2011) found that "many times faculty would agree to use simulation, but in actuality would never get around to using the simulators" (p. 99). It is essential that information be shared between programs that encompass strategies used to initiate, maintain, and overcome obstacles to the use of HFS in baccalaureate nursing programs. The purpose of this study was to identify effective structures, processes, and outcomes used by baccalaureate nursing programs for successful integration of HFS into undergraduate nursing programs. A greater understanding of these factors can be used to design a program that effectively prepares and supports nursing faculty at the local level to develop and implement simulation teaching strategies within a realistic workload. This program, in turn, may help to increase the effectiveness of using HFS in preparing nurses for practice.

Evidence of the Problem from the Professional Literature

The problem described at the local level is reflected in studies in the nursing literature (Adamson, 2010; Aktar-Danesh, Baxter, Valaitis, Stanyon, & Sproul, 2009; Aldridge, 2016; Al-Ghareeb & Cooper, 2016; Anderson, Bond, Holmes, & Cason, 2011; Howard, Englert, Kameg, & Perozzi, 2011; Jansen, Berry, Brenner, Johnson, & Larson, 2010; Jansen, Johnson, Larson, Berry, & Brenner, 2009; King, Moseley, Hindenlang, & Kuritz, 2008). These studies, for the most part, have identified many of the same issues. The issues identified as problems include the number of students using simulators at one time; training of faculty in the use of simulators; time constraints relevant to developing and facilitating simulated experiences; need for teaching strategies that accommodate simulators, laboratory, and storage space; equipment needed to make simulation realistic; and different types of simulators used for different purposes (Aldridge, 2016; Al-Ghareeb & Cooper, 2016; Hayden, 2010; Kardong-Edgren, Willhause, Bennett, & Hayden, 2012).

It is important to address these identified problems so that simulation can be implemented more effectively into nursing education programs. Numerous authors have identified patient safety issues as reasons to use HFS so that students have opportunities to practice new skills in a safe and closely supervised environment (Aldridge, 2016; Gantt & Webb-Corbett, 2010; Sears, Goldenworthy, & Goodman, 2010; Tanicala, Scheffer, & Roberts, 2011). In addition, simulation could help to alleviate the lack of clinical sites for teaching (Katz, Peifer, & Armstrong, 2010).

The percentage of simulation hours to include in nursing education curricula versus hours at the clinical site is still controversial. Nehring (2008) collected data about

various state regulatory issues from members of boards of nursing in 44 states, the District of Columbia, and Puerto Rico. Data revealed that sixteen of these states surveyed allowed replacement of clinical hours with patient simulation but did not stipulate the percentage of time. The responding states also varied on the ratio of faculty to students in clinical sites, and some states regulated the number of clinical hours required to obtain the registered nurse licensure.

Hayden, Smiley, and Gross (2014) revisited the state regulatory issues and found that eight states and six international jurisdictions dd not allow the replacement of clinical hours with simulated experiences. The researchers found that four states (California, Florida, Vermont, and Virginia) specified in their state board regulations that the maximum percentage of simulated experiences that could be substituted for clinical hours was approximately 25%. Internationally, Singapore has specified a maximum of 10% of clinical hours to be substituted with simulated experiences (Hayden et al., 2014). Hayden et al. also found that the 38 remaining states in the United States did not specify amounts of acceptable substitutions. At the time of the study, the District of Columbia had drafted but not yet approved a maximum of 20% clinical substituted simulations (Hayden et al., 2014). Gore, Gele, Ravert, and Mabire (2012) discussed the use of simulation in nursing curricula internationally and found that 56% of responding programs did not use HFS as clinical time and of the programs that do use it, 1 hour of simulation is equal to 1 hour of clinical time.

Brewer (2011) researched the literature for evidence of successful integration of simulation into nursing education, finding 10 acceptable articles which were within the

last 5 years, with authors who had analyzed and reported their findings. Brewer found that some articles discussed knowledge acquisition by applying didactic coursework into simulated experiences. Other studies found encouraged cooperative learning by student interaction, recorded sessions for later review, and individual interaction in a team setting. Brewer's review of literature showed that learning within a safe environment occurred when students were able to make mistakes that did not injure actual patients. Brewer suggested that more quantitative research needed to be conducted to justify the money, faculty time, and student investments relating to the use of HFS.

Definitions

For this study, I defined the following terms using information synthesized from various articles I used in the literature review for this paper:

Best practice: Best practices are considered gold-standard and are documented, researched, and support desired outcomes (Cowen & Moorehead, 2011).

Clinical placement: Facilities that agree to take nursing students so they can experience and learn from hands-on patient care. These placements sometimes stipulate faculty to student ratios, number of student placements per unit, ability to document patient findings, and pass medications while in their facilities (Benner, Sutphen, Leonard, & Day, 2009).

Faculty: Full and part-time registered nurses who have attained a master's degree or higher in nursing and have graduate training that includes specifics related to clinical experience; education of adult learners, and specifically, nurses; and development and application of curriculum. (National Council of State Boards of Nursing, 2008).

Faculty training: The means by which the faculty members learn to use the simulators and simulated experiences (Adamson, 2010; Akhtar-Danesh et al., 2009; Anderson et al., 2012; Brewer, 2011; Gantt, 2013; Howard et al., 2011; Jansen et al., 2009; Jansen et al., 2010).

High-fidelity simulation (HFS): Programmable full-body mannequins controlled by computers, which allow responses to learner actions (Adamson, 2010; Akhtar-Danesh et al., 2009; Anderson et al., 2012; Brewer, 2011; Gantt, 2013; Hayden, 2010; Howard et al., 2011; Jansen et al., 2009; Jansen et al., 2010).

Outcome factors: Outcome factors can include test scores, the application of knowledge with change in patient care provided, the ability to critically think and reason, National Council Licensure Examination (NCLEX) pass rates, standardized test scores, student and faculty satisfaction scores, or employer satisfaction scores (Donabedian, 1980; Thompson, 2011; see Appendix C).

Perceived obstacles: Situations or circumstances that faculty have identified that make it difficult to adopt or implement HFS into their curriculum (Jansen et al., 2009).

Process factors: Process factors would include the governance of the institution, and/or the school of nursing; the pedagogy of curriculum delivery; the organizing framework; research conducted within the organization; and the education provided (Donabedian, 1980; Thompson, 2011; see Appendix C).

Simulation: Simulation includes task trainers such as an arm for practicing intravenous insertion (medium-fidelity) to a mannequin (high-fidelity) programmed to

perform replication of specific human functions allowing nursing student to practice clinical skills and behaviors (Hayden, 2010; Kardong-Edgren et al., 2012).

Structure factors: The building and the financial and personnel resources available to work with HFS. This includes any simulation technicians, information technology specialists, simulation coordinator, faculty working within the school of nursing curriculum, administrators, physical nursing school, simulation laboratory/laboratories, and all financial resources available for simulation (Donabedian, 1980; Thompson, 2011; see Appendix C).

Successful integration: Schools of nursing that have built the lab, purchased the technology, and incorporated HFS into the classroom and have used it as an adjunct to clinical practice. These schools schedule HFS in all clinical concept courses that facilitate the type of HFS they have acquired (if no pediatric simulator, pediatric simulation would not be feasible). It does not include programs that only use HFS as a skill learning station or to teach concepts in the didactic portion of their curriculum (Thompson, 2011).

Workload: Workload consists of faculty assignments and work distribution amongst the curriculum for purposes of determining responsibility. Workload responsibilities include course and curricular revisions, conducting research, providing service to the institution and community, and maintaining knowledge of current practice (Cowen & Moorehead, 2011).

Significance

I selected integration of HFS into an undergraduate baccalaureate nursing curriculum as the topic for this study because of the local problem, as well as similar problems reflected in the literature. Facilities that purchase HFS spend hundreds of thousands of dollars, making this teaching strategy a significant allocated resource. Yet, the literature reflects a lack of understanding of how to implement this resource effectively.

Hospitals in past decades provided training of nursing students, exerting control over nursing curriculum. In fact, in the 1970s, it was not unusual for students to live in dormitories supplied by hospitals and be on-call or on duty 24 hours a day (Waldner & Olson, 2007). Reasons for the lack of clinical placements in today's healthcare arena include larger faculty-to-student ratios, lack of clinical sites for student learning, shortened lengths of patient stay, increases in patient acuity, and shortages of both faculty and staff nurses (Richardson & Claman, 2014). This has resulted in the need to use other means to provide nursing students with the opportunities to learn skills, and practice critical thinking. HFS has become that means of providing these experiences for students and also providing safety to patients (Richardson & Claman, 2014).

The most significant barrier to nursing education was "lack of quality clinical sites that can accommodate the number of students in my group and/or provide experiences relative to the learning objectives of my course" (p. 64) as noted by McNelis, Fonacier, McDonald, and Ironside (2011) when they discussed a report from the National League of Nursing (NLN). Teaching strategies used to make up for the lack of sites

included more observational opportunities; simulation experiences; and clinical rotations on weekends, nights or evenings, and holidays (McNelis et. al., 2011). Many schools have had to use sites that require faculty and students to drive significant miles, causing problems, with orientation to the facilities and increases in administrative costs (McNelis et. al., 2011). Since nursing programs are finding fewer clinical sites for students to practice in, HFS constitutes an important resource for teaching clinical skills before students' assignments to clinical sites. As Nehring (2008) found, the use of simulation can be useful in addressing faculty shortages, increased student numbers, increased cost of clinical placements, and decreased placement sites for students.

Effectiveness of using simulation in teaching of nursing is increasing. The National Council of State Boards of Nursing (NCSBN) conducted a 3-year longitudinal study from the fall of 2011 through May of 2013 (Hayden, Smiley, Alexander, Kardong-Edgren, & Jeffries, 2015). This national study substituted simulated experiences for clinical experiences in three different increments. The NCSBN used a control group with 10% of clinical hours done in simulation and the other two groups used 25% and 50% of clinical hours completed through simulated experiences. When compared, there were no significant statistical differences in the three groups using assessed competencies as determined by instructors/preceptors, NCLEX pass rates, and comprehensive knowledge assessments. Six months after graduation, these same nurses showed no differences as determined by their mangers in readiness for practice of competency in the clinical setting (Hayden et al., 2015).

Faculty in the local setting understood the benefits of integrating simulation into the nursing curricula but had had little guidance and workload release to accomplish it. I used this study to gather and analyze data to identify successful strategies, as well as obstacles to avoid, in implementation of HFS into a baccalaureate nursing curriculum. The findings generated by the study describe faculty perceptions relevant to faculty workload that can guide administrators and faculty in ensuring that adequate time is allowed for effective integration of HFS into the curriculum.

Findings from the study contribute to an understanding of the local problem by identifying faculty perspectives on best practices for integration of HFS into the nursing curriculum. Insights gained from the study may guide development of faculty training, allocation of time for simulation, development of scenarios for simulated experiences, and evaluation of simulation experiences. In the results of this study, I identified elements relating to structure, process, and outcomes that can be used to guide future acquisition of HFS and the integration of HFS into baccalaureate nursing curriculum. In addition, my dissemination of information from this study at professional conferences and publications may assist nursing faculty at other institutions in understanding best practices for integration of HFS into their program.

Research Questions

I designed this study to add to current knowledge relating to faculty perspectives of integration of HFS into a nursing curriculum and provide strategies and techniques for best practice. Since it was designed as a qualitative study, I formulated the research questions to explore nursing faculty perceptions of essential factors that impact

successful integration of simulation into a baccalaureate nursing curriculum. These factors included faculty training, faculty perceived obstacles, and faculty workload. The research questions that guided the study were as follows:

1. How do faculty describe successful integration of HFS into a baccalaureate nursing curriculum?
2. What structure factors are related to successful implementation of HFS into a baccalaureate nursing curriculum?
3. What process factors are related to successful implementation of HFS into a baccalaureate nursing curriculum?
4. What outcome factors are related to successful implementation of HFS into a baccalaureate nursing curriculum?

Answers to these questions provided important information needed in relation to best practices for the integration of HFS into baccalaureate curricula. Lack of clinical sites for practice makes the use of HFS more critical for education in lieu of the current nursing shortage.

I will begin the literature review with a brief explanation of the theoretical frameworks I used in the exploration of integration of simulation in a baccalaureate nursing program. Faculty knowledge and expertise are driving factors in the integration of simulation but can become barriers to integration when faculty members have little or no previous knowledge or experience in conducting, designing, or facilitating simulation. I will also discuss simulation used to address patient safety, replacement for lack of

clinical sites, regulations that govern the use of HFS, and faculty perceptions on the use of HFS.

Review of the Literature

HFS is quickly becoming the medium of choice in many nursing programs (Gore et al., 2012; Hayden et al., 2015; Nehring, 2008,). Simulation labs are being built and faculty is being expected to integrate this new strategy into the nursing curriculum. I conducted a literature review on this topic using databases such as Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medline, and OVID, as well as the search engine, Google Scholar. Keyword search terms I used included: *patient safety, integration of human patient simulators, high-fidelity simulation, faculty perspectives of high-fidelity simulation, barriers to high-fidelity simulation, simulation,* as well as *faculty workload and simulation*. Exclusion of articles was based on student factors such as perspectives, outcomes, and confidence levels.

Conceptual Framework

This study of faculty perspectives relating to HFS needed to be based on a theoretical framework that would incorporate the questions of the study. For this reason, I used the structure-process-outcome model by Donabedian (1980). The structure-process-outcome model stressed quality, which in the nursing program relates to patient care, safety, and clinical experiences. Structure relates to having the necessary equipment including maintenance, the structure of governance and decision making within the organization, and the numbers and skills of the personnel teaching with simulators. Process relates to education and knowledge of faculty charged with the development of

HFS within the program and the courses chosen to facilitate HFS experiences. The changes in behaviors of the student population within the nursing program through HFS experiences demonstrate the outcomes of the use of HFS in a nursing curriculum. This framework has been used with simulation to develop an orientation program to assist the new graduate nurse in developing clinical reasoning and transformation to the work unit (Hatler, Stoffers, Kelly, Redding, & Carr, 2011).

Donabedian's (1980) structure-process-outcome model provided the framework for this study to identify best practices for the integration of high-fidelity simulation into a baccalaureate nursing program. Thompson (2011) also used this model in a descriptive analysis doctoral study to identify use of simulation as a teaching strategy. I also used this framework to design my project, based on findings from my study, to assist faculty to identify structure, process, and outcomes that need to be considered in the development of simulated experiences in the curriculum.

Current Research on Integration of Simulation

The need to integrate HFS into the nursing curriculum begins with discovery of what is currently known about faculty adoption of simulation. I have divided this section into various subsections detailing current knowledge found in the literature concerning safety, scarcity of clinical sites, regulatory provisions of the various U.S. states, and faculty perspectives related to integrating simulation into the curriculum. The details of this literature search are described in the following pages.

Patient safety and scarcity of clinical sites. Today's clinical nursing practice reflects issues relating to providing quality care in a safe environment and allowing the

patients some autonomy relating to their care. Patient safety and sufficient clinical experience are the primary concerns of most nursing programs. Several studies have identified patient safety as a significant factor in nursing student education and practice (Coleman et al., 2011; Gantt & Webb-Corbett, 2010; Ironside, Jeffries, & Martin, 2009; Sears et al., 2010; Shearer, 2013; Tanicala et al., 2011). Aggarwal et al. (2010), although discussing medical education, related the need to keep patients safe from harm and reflected on the use of simulation training for patient safety in all the healthcare fields including nursing. The authors found that for medical students, the first concern is the patient, attending to the patient using good standards of care, and respecting the patient's individuality by working with them to determine care. Simulation dollars are best spent in a collaborative practice within a professional setting including nursing and allied health (Aggarwal et al., 2011).

The current nursing shortage has caused many programs to increase admissions and add more programs (such as advanced degrees), in order to produce more quality nurses (Benner et al., 2010). This also means that more sites are often needed for students to practice clinical skills. Blum and Parcells (2012), in an attempt to determine if nursing educators were using simulation to assuage the techno-savvy student population, conducted a literature review of 18 articles related to HFS simulation and safety. The studies reviewed were quantitative in design, and their conclusion demonstrated that HFS simulation is an appropriate intervention for teaching safety and to address the shortage of clinical sites for nursing students.

Two studies identified means to alleviate the lack of clinical sites and clinical faculty. Katz et al. (2010) stated that "In many localities nursing educators have experienced shrinking availability of clinical sites and fewer clinical experiences for nursing students" (p. 47). They studied 60 NLN-accredited baccalaureate programs and found that most medical/surgical courses used simulated experiences to replace clinical hours but the amounts of replacement hours varied. Coleman et al. (2011) developed a train-the-trainer program in the coastal area of Texas through partnerships with area hospitals, community colleges, and universities to help faculty in the use and design of effective simulated experiences and make up for the lack of clinical sites. The originally trained 53 faculty put together a model curriculum used in the coastal area to combat the nursing shortage, faculty shortage, and clinical site shortage.

The study conducted in 2010 by NCSBN was discussed by two groups of authors, Hayden (2010) and Kardong-Edgren et al. (2012), in relation to the use of patient simulators in schools of nursing. Hayden discussed the 1,060 nursing education programs responding about the use of the various forms of simulation. Simulators discussed included (a) task-trainers such as an arm for intravenous insertions, or partial body mannequins that allow students to insert tubes for practice; (b) medium-fidelity simulators have breath and heart sounds, but do not respond to interventions; and (c) HFS which are a full body simulator programmed to respond to interventions provided by students in the laboratory setting (Hayden. 2010). Hayden also discussed the various nursing courses in which simulators were used, length of scenarios, use of debriefing and the writing of scenarios. These elements were identified as necessary in the use of

simulation as a teaching strategy (Hayden, 2010). From this same 2010 NCSBN study, Kardong-Edgren et al. (2012) found that faculty education relating to simulation and time constraints are two identified deterrents to the wider use of simulated experiences. They investigated how educators felt about the use of simulation in their programs. Most respondents (81%) felt they should be using simulation more, while only 18% felt they were using adequate amounts of simulation in their program. These findings add to the knowledge that although nursing programs are using simulation, evidence is lacking as to whether that use is in adequate amounts. The study also identified the belief of faculty that the lack of funds and time necessary to train in the use of HFS are deterrent factors to effective use of HFS in nursing education (Kardong-Edgren et al., 2012).

State regulations of simulation use in lieu of clinical sites. Nehring (2008) surveyed state boards of nursing (44 state boards participated), the District of Columbia, and Puerto Rico to determine state regulations relating to the use of simulation in lieu of clinical sites and provided the following results. Sixteen of the 44 states that participated did not specify a specific percentage of clinical hours for simulation, and most nursing state boards relegated results on a case-by-case basis. This information was restudied by Hayden et al. (2014) to determine most recent information and noted that some states (eight) and international territories (six) do not provide in their regulatory language for simulated experiences to replace clinical hours. Virginia, Vermont, California, and Florida specify maximum amounts of simulated experiences that can be substituted for clinical hours in their state board regulation, and this stipulation is 25% or less (Hayden et al.,). One jurisdiction in the study has determined the maximum at 10% (Singapore).

The researchers found that several states (38) have not specified acceptable amounts to date but work with nursing programs on individual basis. The District of Columbia had drafted regulations of 20% substituted hours, but at the time of the study, this amount had not yet been approved (Hayden et al., 2014).

Interestingly, through a survey of members of the International Nursing Association for Clinical Simulation and Learning (INASCL), Gore et al. (2012) identified similarities and differences in use of HFS in the United States and internationally. The respondents to the survey included 206 United States facilities and 48 international facilities. The U.S. respondents identified significant differences imposed by state boards of nursing on using simulation as a replacement of clinical hours. International respondents identified that 56% of respondents indicated that simulation is not counted as clinical time. This number was compared to 17% in the United States who do not use simulation to count for clinical hours. International respondents identified 1 hour of simulation was equivalent to 1 hour clinical time, but in the United States, these ratios varied significantly.

Hayden (2010) also discussed using simulation as a replacement to clinical hours in the study done in 2010 by NCSBN. Hayden reported that when respondents were given the option of substituting simulation for clinical time "if no rules, regulations, or limitations prevented them from doing so, only 20% said they would not" (p. 55). Some respondents replaced clinical hours with simulation, some used it as additive clinical time, but most would be comfortable substituting 25% of clinical time with simulation. Further investigation into replacements showed that 83% of those substituting clinical

with simulation use 1 hour of clinical to 1 hour of simulation (Hayden, 2010). A smaller percentage (10%) of the respondents used less than 1 hour of simulation to 1 hour of clinical time and 7% used more than 1 hour of simulation to replace 1 hour of clinical.

Faculty perceptions relevant to HFS in nursing curricula. One solution to the shortage of clinical sites for students is the use of HFS to provide students with opportunities to practice clinical skills. Several authors have identified faculty member concerns relating to the adoption, integration, and set-up of HFS in nursing curricula (Adamson, 2010; Akhtar-Danesh et al., 2009; Aldridge, 2016; Anderson et al., 2011; Howard et al., 2011; Jansen et al., 2009; Jansen et al., 2010; Kardong-Edgren, Starkweather, & Ward, 2008; King et al., 2008; Nehring, Wexler, Hughes, & Greenwell, 2013). In these studies, concerns voiced by faculty were identified as training in the use of HFS, time needs of the faculty developing and using HFS, numbers of students in classes using HFS, changes needed in current teaching strategies, space and equipment needed to make HFS as real as possible for the student, and scheduling conflicts with the simulation lab and other classes.

Faculty and student perspectives of integrating simulation into a foundations course were investigated by Kardon-Edgren, Starkweather, and Ward (2008). In this study, three scenarios were developed by faculty and designed to build on each other relating to clinical experiences. Faculty perspectives related that although it was an interactive learning tool, it required extensive time allocation and coordination of personnel. Faculty in the study were hard pressed to run the simulation and evaluate student performance. Howard, Englert, Kameg, and Perozzi (2011) also discussed

perceptions of integrating simulation into a nursing curriculum using student interviews and faculty member focus groups. Students and faculty had positive perceptions of the effectiveness of utilizing simulation as a learning/teaching tool. Simulation, according to the faculty members, facilitated communication skills, allowed students to intervene in situations rarely experienced in clinical settings, and could be developed around current course content. Faculty members discussed some of the obstacles encountered using simulation such as lack of knowledge relating to simulation itself and the use of the technology; time needed to use and incorporate it into your class; space for simulation manikins and equipment; scheduling of students; and affecting realism in the simulated experiences.

A three-phase Delphi study was conducted by Arthur, Levett-Jones, and Kable (2013) related to the integration of simulation into nursing curriculum. The study involved 17 experts from Australia, North America, Hong Kong, and Europe. The first phase consisted of 17 experts, the second phase was completed by eleven of the original 17, and the third phase by 12 of the original 17 members. The final result identified 15 quality indicators placed under five key areas consisting of "pedagogical principles, fidelity, student preparation and orientation, staff preparation and training, and debriefing" (Arthur et al., 2013, p. 1359). A brochure was distributed in November of 2010 on the website of the Australian Learning and Teaching Council and to persons attending the Simulation and Beyond Symposium, School of Nursing and Midwifery, the University of Newcastle. In June 2011 it was distributed to attendees of the International Nursing Simulation/Learning Resource Center Conference held in Orlando, FL.

Obstacles identified by faculty to the integration of HFS in nursing programs were discussed by Jansen et al. (2009). This study was conducted at five universities and five community college programs. These obstacles negatively affect faculty use of simulation and include time, faculty attitudes, space and equipment limitations, scheduling conflicts, sufficient financial backing, staff, and keeping other students engaged when they are not in simulations. Faculty identified issues related to finding time to develop and thoroughly think through simulated scenarios. Financial constraints included purchase, upgrade, and maintenance of simulation equipment. Space and equipment issues related to current available space as well as equipment needed to make simulation as real as possible for students to believe in the scenarios and respond accordingly. Training needs for faculty related to the incorporation of simulation in the classroom, and use of the simulators in the laboratory. Simulation requires more faculty members to conduct than lecture in the classroom. A follow-up to this study (Jansen et al., 2010), was the implementation of a state-wide program to increase faculty interest in and use of simulation in the nursing curriculum following their previous study. A 5-year faculty development program incorporating online discussions, video-conferencing, and workshops for the purpose of preparing nurse educators in the use of HFS was implemented. Results were inconclusive due to low rates of returns on surveys over the period of 5 years, possibly due to loss of faculty members from the original team. The project did help faculty learn to develop scenarios for simulated experiences in the clinical setting.

Obstacles or barriers to the use of HFS were also described by Hanberg (2008) in a study of 323 faculty, both associate degree and baccalaureate, to explore perceived barriers to integrating simulation into a nursing curriculum. Lack of funding of simulation was perceived as a major barrier in this study. Faculty felt they were expected to learn simulation on their own. One comment consisted of "Simulation is great, but unless I am provided adequate time to plan, develop, deliver and evaluate, it will not be a priority for me" (Hanberg, 2008, p. 165). The study showed the least barriers were perceived by faculty who were 49 years-old or less, who taught mainly clinical aspects of courses, and who had less experience with simulation. This study suggests a high degree of administrative input into the planning is needed when adding simulation into a nursing curriculum. A descriptive study by Thompson (2011) explored the nursing programs of the metropolitan area involved in the current proposed study. Identified barriers and incentives used to implement HFS in the local region, were discussed, but the study did not investigate how these programs implemented HFS into their curriculum or the faculty perceptions of having to integrate HFS into their curriculum.

Time and faculty training were found to be an issue in the study by Jones and Hegge (2008). A survey with a usable sample of 29 faculty members, full time and part time, from a Midwestern baccalaureate program, gathered data relating to the time needed to plan, implement and evaluate simulation. The majority or 55.2% of the faculty completing the survey felt the need for at least .50 FTE to plan the use of simulation in their course. Furthermore, 44.8% felt .50 FTE was necessary to implement HFS into their courses. Evaluation of simulation at .25 FTE was suggested by 50.7% of faculty

surveyed. This is also supported in a study by Duvall (2012), with faculty identifying that the use of HFS involved more time than going to clinical, requires training, experience, and resources which were lacking due to budgetary constraints. Benefits identified to the use of HFS included lack of sites for student practice and HFS allowed students to experience situations they may not encounter in the clinical setting. Duval ascertained that of 576 persons completing the survey, 245 faculty (42.5%) felt their expertise was novice versus 175 (30.4%) who felt competent in use of HFS. Most persons (268) in the survey received their training on the job and the next highest (180) was formal training. The survey revealed that 69 of these 576 faculty were identified as hired primarily as a simulation faculty.

Semistructured interviews about training in the use of HFS were conducted with seven faculty members in a small regional university in Australia by Miller and Bull, (2013). Six of the seven faculty had participated in training in the use of HFS. Qualitative data was analyzed and yielded the following three themes. The first theme was simulation as a separate entity, which also revealed faculty felt it was a fad and would not be permanent. The second theme was getting political and related to available forms of funds seen as being political, as well as the high cost of simulation and building the centers for its use. The third theme was academic adaptation, described as uncomfortable for educators who felt they were being watched and graded based on their performances. Others discussed the difficulties of putting large numbers of students into small spaces to perform simulated exercises.

Comfort levels of faculty who work with simulation had also been explored. Focus groups and individual interviews involving 20 clinical instructors were analyzed by Harder, Ross, and Paul (2013). The question being studied was "what is it like to engage in simulated clinical experiences as an instructor" (Harder et al., 2013, p. 1243). These instructors had an average of less than 5 years instructing in the clinical setting but over 20 years in nursing practice on average and reported feeling dread, discomfort, and some felt it was a learning experience for them as well as the students. Very few felt comfortable in the simulated setting, and felt they did not know what to do, lacked qualifications, and this lack of comfort affected student learning. Davis (2012) used a mixed method to study 139 self-selecting national participants to determine their comfort level teaching with simulation. The study used six different assessment tools to assess faculty views and revealed that faculty were "moderately comfortable with including simulation within the nursing curriculum" (p. 56); had "moderately positive perceptions of existing clinical sites" (p. 56); "felt students were moderately ready for simulation learning" (p. 56); "had a moderate sense of self-efficacy beliefs associated with simulation" (p. 56); "moderately confident with their teaching skills associated with simulation" (p. 57); and lastly "highly satisfied with student simulation learning outcomes" (p. 57). The author felt the study might be skewed due to the fact that these participants had selected themselves to participate. Interestingly 75% (n = 105) of the schools had a clinical coordinator for their simulation labs. Faculty-to-student ratios ranged from 1:130 on the high side to 1:2 on the lower end.

Faculty development in the use of HFS as a teaching strategy has been identified by and will be discussed here. A systematic review of research relating to faculty development was conducted between the year 1995 and June of 2013 by Nehring et al. (2013). The authors included 25 studies using descriptive, quasi-experimental, qualitative, and quantitative designs. Five themes were identified in the systematic review: (a) benefits of using HFS, (b) incentives to encourage faculty use of HFS, (c) need for one person to run and facilitate simulation, (d) obstacles or barriers to using HFS, and (e) faculty training in the use of HFS. A two-part faculty development workshop discussed by McNeill, Parker, Nadeau, Pelayo, and Cook (2012) found that the program was highly effective and attendees felt the material presented was most helpful. The two parts of this project, one for experienced educators and one for beginning educators, were described. The experienced educators attended a half-day workshop to discuss the current use of simulation and to experience HFS through all forms of simulators. The second part was conducted for beginning educators in simulation and consisted of a program funded continuing education offering over 4 weeks. These beginner participants were hired to teach in a collaborative program.

Information about use and underuse of simulation in nursing programs is valuable when discussing adding this teaching strategy to a nursing curriculum. Interviews with faculty who used simulation in their program revealed 90% of the faculty in that program currently used simulation (Dowie & Phillips, 2011). However, this same faculty (40%) had a lack of confidence in using the simulators, and only 35% felt they had been adequately prepared to use simulation. All of the faculty believed simulation to be an

effective teaching strategy and felt that teaching modules in the use of HFS would be effective in increasing their confidence. Faculty buy-in is associated with use of simulation. Schlairet (2011) originally surveyed faculty in 2006 and of those faculty, 63% did not use simulation. Simulation was begun, and 4 years into the program most faculty were trained in the use of simulation and used 25% of the clinical hours in simulated experiences. Faculty determined that course learning outcomes were readily achieved using the simulated experiences.

A two-phase study looked at the underutilization of HFS (King, Moseley, Hindenlang, & Kuritz, 2008). They found in Phase I that students, administrators, and faculty wanted to use simulators, but lack of experience with simulators, amount of time necessary to set-up scenarios, and training/education relating to simulators were the issues resulting in underuse of HFS. In Phase II, King et al. applied an intervention (educational offerings) and placed the educators in the student role with researchers playing the role of faculty. The "students" were allowed to prepare for a simulated exercise, participate in the exercise, and also participate in the debriefing following the simulated experience. The content of the workshop assisted faculty in developing scenarios for a six-hour clinical setting, and also provided the structure for using simulation experiences in theory course work.

Faculty knowledge and expertise with technology described as distance learning, telehealth, informatics and computer fundamentals, and simulation was studied by Nguyen, Zieler, and Nguyen (2011). Researchers reported an increased usage of simulation in faculty who had training, but they also found that usage of simulation was

not significantly affected by having technical or financial support. Higher simulation knowledge was found to be more prevalent with administrative support.

There is a lack of clinical placement sites for nursing students and no consistent guidelines provided from the state boards of nursing related to the use of simulation to replace clinical practice. In fact, the states are not consistent on time frames for clinical practice either as demonstrated in the literature. A second area found in much of the research making HFS appealing is patient safety, which is a high priority concern in the medical and nursing professions. Finally, faculty perspectives align with the need for time off to develop and implement HFS into a curriculum, the need for faculty training relevant to designing and using simulated experiences, and a need for faculty members whose responsibilities align solely with maintaining, structuring, and providing simulation within a nursing program's curriculum.

Implications

Nursing programs around the country are experiencing a lack of clinical placement sites for students. Exploration of shortage of clinical placement sites, state regulation related to usage of simulation to replace clinical time, patient safety, and faculty perceptions of simulation were reviewed. Research supports using simulation as a teaching strategy in nursing education. Nursing programs have invested thousands of dollars to purchase high-fidelity simulators for the purpose of supplementing their curriculum and providing safe practice for students.

Laboratories designed for HFS provide a safe environment in which the student can gain confidence in their skills and critical thinking ability to function in the clinical

arena and provide safe patient care. The shortage of clinical placements for nursing students demonstrates appropriate consideration of simulation as a replacement for clinical practice, at least in part. Faculty development and technical support would need to be initiated to support this teaching strategy to its fullest potential. This study will add to the current information available for administrators and faculty who wish to integrate high-fidelity simulators into a baccalaureate curriculum.

Currently nursing programs are not required to develop a business plan in order to procure funds for simulation. Consequently, some programs procure the funds, buy the equipment and then never use it or they don't use it to its full potential. While INACSL (International Nursing Association for Clinical Simulation and Learning; 2013) and the NLN (2015) have developed guidelines and principles for the use of HFS, they provide little to no guidance on how to develop a program in the nursing curriculum for the adoption and integration of simulation into their curriculum.

The findings of this study identified a need for education, resources, and guidance for the integration of simulated experiences into a nursing curriculum. I have developed three online education modules and each is 2 weeks in length. Participants will be given an activity to be submitted via e-mail to me before the beginning of Week 2 and at the end of the third module or before the end of Week 6. An assessment pretest will help identify the familiarity and attitudes of the participant prior to beginning Module 1. Module 2 will concentrate on the writing of scenarios, and Module 3 will identify needs in relation to debriefing of all simulated experiences, clinical experiences, and sometimes classroom activities. Outcomes of this study could lead to future research to explore

further knowledge relating to best practice for integration of HFS into baccalaureate nursing curriculum. These future research studies or results would stimulate articles, presentations, and further advancement of simulation-based evidence in support of HFS use in nursing education.

Summary

Simulation is used by most programs as a replacement for partial fulfillment of clinical hours, regardless of the fact that many states do not quantify the amount of simulation that can be used in lieu of clinical hours, nor the equivalency of simulation versus clinical hours in the hospital setting. Barriers to the use of simulation relate to time to build, integrate, and evaluate simulated experiences. Staff development and training relating to building scenarios and using simulation are identified in the literature as barriers to the use of simulators. Support services relating to maintenance, upgrades, and technical upkeep are further barriers to using simulators.

In the next section, I will discuss the study design used to investigate faculty perspectives and ways to improve or structure the addition of simulation into a baccalaureate nursing curriculum. Design of the study, proposed sample population, methodology, and areas relating to data collection, reliability and validity, and analysis will also be provided in the section. Findings of this study indicated the need for education about simulation, how to write scenarios, and how to effectively debrief students at the conclusion of the simulated experience.

Section 2: The Methodology

Introduction

The purpose of this study was to explore perceptions of nursing faculty about best practice elements for successful integration of HFS into an undergraduate nursing program. The research method I employed was a qualitative case study using an e-mail questionnaire to collect information from faculty in baccalaureate nursing programs that had integrated HFS into the nursing curriculum. E-mail questions were related to Donabedian's (2003) structure, process, and outcome model and were focused on quality indicators in nursing education and specifically the use of high-fidelity simulation (see Appendix C). The research questions were gleaned from the tool, Use of Simulation Technology (USTI) designed by Thompson (2011) that was used in a descriptive study. The original tool was designed and is copyrighted using Donabedian's (2003) structure-process-outcome model. I decided that this tool was a good fit for my study design and contacted the author for permission to adapt the tool for use in this study (see Appendix D).

Research Questions

1. How do faculty describe successful integration of HFS into a baccalaureate nursing curriculum?
2. What structure factors are related to successful implementation of HFS into a baccalaureate nursing curriculum?
3. What process factors are related to successful implementation of HFS into a baccalaureate nursing curriculum?

4. What outcome factors are related to successful implementation of HFS into a baccalaureate nursing curriculum?

Figure 1 illustrates the relationship of Donabedian's (2003) model to the research questions. I used this model to describe findings of the research study.

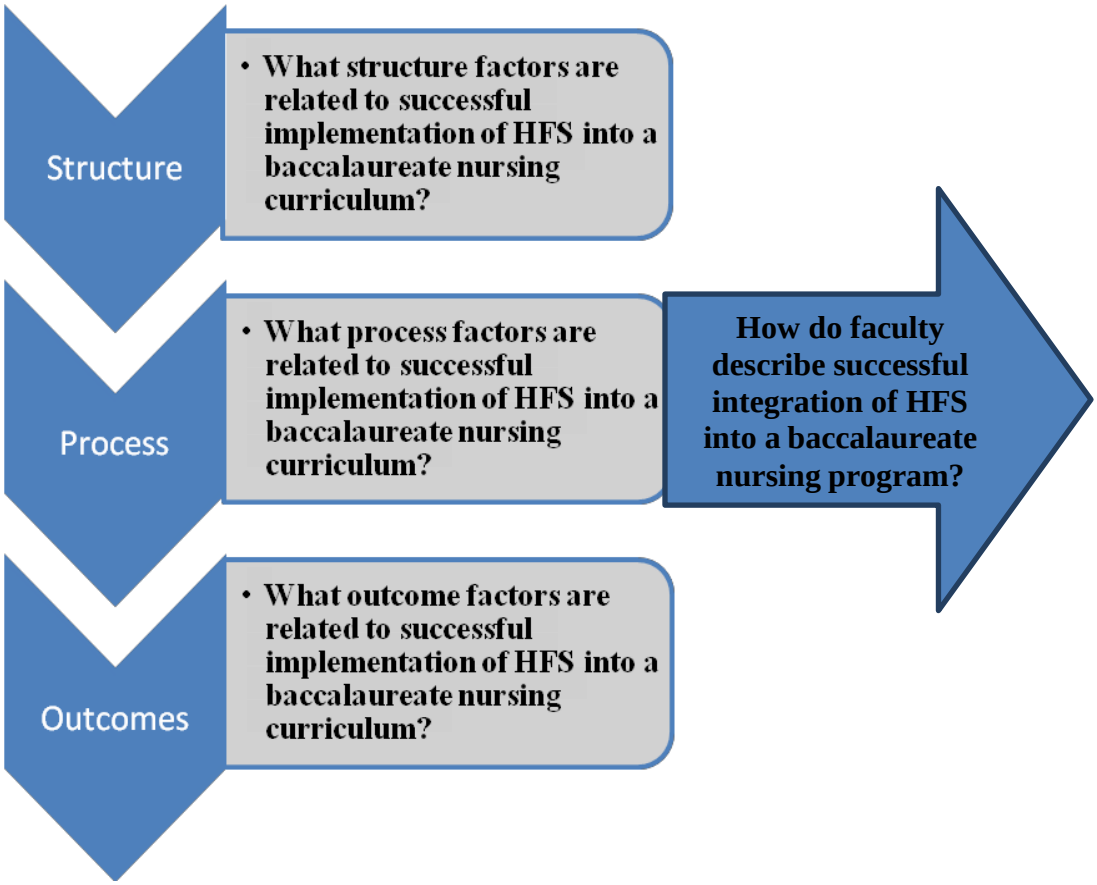

Figure 1. Relationship of Donabedian framework to research questions.

Research Design

Previous research has identified proposed obstacles to the use of HFS as a teaching strategy, yet programs are successfully using this new strategy in their curriculum. Arthur et al. (2013) stated "Although there is evidence supporting the efficacy of simulation technologies and the contribution these approaches can make to

engage teaching and learning, educators need guidelines for effective implementation and curriculum integration" (p.1357). Further research is necessary to provide guidelines on the most effective means of integrating this teaching strategy into the nursing curriculum (Adamson, 2010). In the next section I will discuss the research design chosen for my study and the rationales for that choice.

The research design I chose was a qualitative case study of a baccalaureate nursing faculty using HFS in the curricula both as a teaching strategy and to replace clinical practice. Baxter and Jacks (2008) described the qualitative case study as "an approach to research that facilitates exploration of a phenomenon within its context using a variety of data sources" (p. 544). They went on to explain that this type of research allows the researcher to delve into the issue by viewing it through several content areas and several different points of view. Merriam (2009) noted that qualitative research is about the participants' experience, how they view their experience, how they see their world through that experience, and what the experience means to them individually. Waltz, Strickland, and Lenz (2010) described the end result of case study methods as the details of the case, provided as researcher's descriptions including any generalizations to a population and what the researcher has learned during the study.

Arthur et al. (2013) identified the need for further research in the area of integration of simulation throughout the baccalaureate nursing curriculum. The emphasis of this study was on the establishment of best practice for implementation. The particular case for my study included five baccalaureate nursing programs in the metropolitan area of a city in the Midwest. There are seven baccalaureate nursing programs in the

metropolitan area, but only five of them accepted my request for participation. Two nursing programs were not used in this study. One due to school policies against participating in research done by outside researchers. The other program required outside researchers to apply through one of their current university faculty members, so I was not able to individually send in an Institutional Review Board (IRB) application as a doctoral student not affiliated with their program. The programs chosen and used in my study had integrated HFS into their nursing curriculum and used it on a yearly basis in specific courses.

I chose a qualitative approach for the study in order to obtain in-depth information from faculty about their perceptions of best practices in successful integration of HFS into their nursing program. This study was not experimental in nature, because, as Johnson and Christenson (2012) explained, "there is no manipulation of an independent variable" (p. 42). I rejected a causal comparative study design because causality was not the focus for this study. A phenomenological study was not appropriate because the focus was not on in-depth understanding of a lived experience (Merriam, 2009). Merriam also noted that ethnography is focused on understanding the social and cultural interactions of persons involved in a study, which was not the aim of this study. Building on a theory based on comprehensive knowledge and understanding of a situation or occurrence constitutes a grounded theory approach (Merriam, 2009); this approach also did not apply to this study. Finally, Merriam noted that using people's stories about a situation and comprehending what they meant to the storytellers constitutes a narrative analysis approach to research, which was not appropriate for this study.

Case study designs provide in-depth studies of a particular person, process, phenomenon, or community (Creswell, 2012; Merriam, 2009; Waltz et al., 2010). In this case, the phenomenon I chose was the study of integrating HFS into a baccalaureate nursing curriculum from a faculty perspective. I chose this case due to a minimal amount of research conducted in the field using the perspectives of faculty who have implemented HFS into their curriculum. Most studies have concentrated on student and faculty satisfaction, student learning, or student confidence related to the use of HFS as a teaching strategy.

Setting for Study

The setting for the study was a metropolitan area of two Midwestern states. The population studied consisted of baccalaureate nursing faculty in this area who had access to HFS and had also implemented it into the curriculum. Although seven programs met my criteria, only five schools were willing to participate and formed the case for this study. The nursing programs from these schools were identified based on the integration of HFS into several clinical courses within the curriculum of each program and HFS being consistently used each year as an adjunct or replacement for some of the clinical hours of these courses.

Participants

Participants were faculty selected from five regional baccalaureate nursing programs in the metropolitan area two states in the Midwest who had integrated HFS into their curriculum. Inclusion criteria included faculty teaching with simulation in a baccalaureate nursing program. Not all faculty who teach in the nursing programs use

simulation in their courses, so for the purpose of this study, participants were required to have taught and used simulation. These individuals were identified using the web page of each nursing program, where information was readily available. I contacted faculty whose roles identified them as faculty using simulation or as the simulation coordinator. The program's web page listed information including their e-mail address, which was used to contact them.

Gaining Access to Participants

I used the website of each of the baccalaureate nursing programs in the area to identify faculty who met inclusion criteria of teaching with simulation in a baccalaureate nursing program. Once IRB approval was granted, I sent an e-mail to the faculty members who met inclusion criteria asking them to participate and respond to the attached questionnaire if they had worked with HFS in their current facility. Participants were informed about the purpose of the study and projected use of the results. I assured them of the confidentiality of their participation and that no one would know whether they chose to participate or not. I also provided an explanation of the study and my role as a colleague in the local metropolitan area, as well as my role as the researcher, in the e-mailed letter.

Protection of Participants

Prior to contacting prospective participants, I obtained research approval from the IRB of the Midwestern university and Walden University (approval number 06-30-15-0260335). It is essential when people serve as participants in research that they are

protected from harm during the research. This includes giving them a choice to participate and keeping their identity and their responses confidential.

Contact between myself and all participants was via e-mail and telephone, if the participant had questions. My role in the study was that of interviewer, using the e-mail questionnaire, and researcher for this study. My role in academia was explained in the letter to prospective participants. I had no influence over the participants other than that of researcher. None of the participants for this study were supervised by me or worked directly under my control and none of the participants were students. Participants were not coerced into participation and I had no relationship with their employers. I maintained confidentiality of participant information using a number system to identify incoming data. For purposes of reporting data, each number was given a corresponding pseudonym, which had no relation to their actual identity.

I contacted potential participants via e-mail with a consent form attached. Completion of the questionnaire by the participant implied consent. Participants returned completed questionnaires via e-mail, names were removed, and a number was given to the returned questionnaire. A log with numbers corresponding to each participant was kept under lock and key in my university office to provide confidentiality of participants. This log was not provided to anyone other than myself. Provision of confidential status allows potential respondents to provide truthful information and protects them from repercussions of sharing information (Creswell, 2012). The list of numbers will be maintained in a secure location in my office for a minimum of five years. At the end of

the 5-year time limit, this log and information will be destroyed using a professional shredding service.

Study Sample

I used purposeful sampling in this qualitative case study. According to Johnson and Christensen (2012), purposeful sampling means the researcher identifies the specific group they would like to survey and then finds persons that fit those criteria. Purposeful sampling is a method of deliberately choosing participants relevant to the phenomenon, which in this case was faculty who had integrated HFS into a baccalaureate program (Creswell, 2012). Creswell (2012) described this type of purposeful sampling as homogeneous. I purposefully conducted this study with a group of people in a specified area, which met the criteria established for that group. The group was faculty in baccalaureate nursing programs using HFS in their curriculum in specific courses each time these courses are offered.

Twenty-two potential participants met criteria and were contacted via e-mail. Nine nursing faculty from five nursing programs returned completed questionnaires and comprised the sample for the study. The projected sample size for this study was 10–15 members of the five programs. As noted in Onwuegbuzie and Collins (2007), the sample size will be based on the research questions, as well as the purpose and design of the study. Since this was a qualitative case study, the estimated sample size allowed for in-depth responses and analysis. Creswell (2012) stated three to five participants are the minimum size for a sample. When using an interview format, it is suggested that 12

participants are an acceptable number of participants, and therefore, the basis for my expected sample size of 10–15 participants (Onwuegbuzie & Collins, 2007).

Final sample size depends on reaching saturation. When discussing samples and collection of data Merriam (2009) explained it as:

> The best rule of thumb is that the data and emerging findings must feel saturated; that is, you begin to see or hear the same things over and over again, and no new information surfaces as you collect more data. (p. 219)

Saturation occurs when no new information is provided from participants (Creswell, 2012; Tuckett, 2004; Waltz et al., 2010). I do not feel that saturation was reached due to the fact that some new information was occurring with each of the completed and returned questionnaires. This could potentially affect the implications derived from this study. A second and third reminder had been sent at two week intervals to all prospective participants who had not previously responded. The timing of the study may have affected the response rate. It was conducted during the summer months between June and early August, when faculty members are not usually working.

Data Collection

Once IRB approval was granted, I contacted faculty members of the five local baccalaureate programs who met inclusion criteria by e-mail to invite their participation. I e-mailed questionnaires to 22 potential participants. The faculty had been identified by referring to the faculty pages from each of the nursing programs, which are readily available online, and identifying those faculty who worked with HFS. Four potential participants provided the following reasons for not completing the questionnaire: one had

retired; one no longer used simulation in their course; one gave no reason; and one gave me two other faculty names, both already on the list. Five potential participants never responded to my e-mails and four others responded that they did not use simulation in their courses. This left nine of the original 22, who responded with completed questionnaires.

The e-mail described the study, its purpose, and design to the prospective participants of the study. The e-mail contained two documents, a consent form for participants explaining informed consent for the study and the interview questionnaire. Prospective participants were asked to print and maintain a copy of the consent form for their own records. The consent form provided details of the study and whom participants might contact for further questions about the study. The second document was the e-mail questionnaire (Appendix E). The questionnaire specifically asked the participant to discuss personal experiences related to implementing and teaching with simulation. Completion of the questionnaire signified their consent to participate in the study. I also provided my phone number so that the participants might contact me with questions about the study if necessary. I received nine completed questionnaires from the 22 originally sent out, equating to a 40% return rate after a second and third e-mail request was sent to nonresponders.

It is important to make sure the participants are well informed and that all questions are answered to their satisfaction. The e-mail contained instructions for completion of the questionnaire and how to resubmit it to me for analysis. According to Creswell (2012), e-mail interviews allow the researcher to quickly access a larger number

of people and the returned documents provide text that is easily accessed and placed in a data base for future use.

I used a researcher-designed questionnaire based on Donabedian's structure, process, and outcome model to obtain open-ended responses from participants (Appendix C). The questionnaire was adapted from a tool entitled Use of Simulation Technology Inventory (USTI) developed by Thompson (2011). The original tool was based on Donabedian's structure, process, and outcome model but contained several items not appropriate for this study. The tool was modified to address factors directly relevant to best practice methods of integrating simulation into nursing curriculum. The author has given permission to use the survey as adapted to fit this study (Appendix D). The tool, once modified to fit my study, had no reliability or validity attached, which could affect the results.

Structure questions in the tool included kinds of funds supporting the nursing program, determination factors for using simulation, incentives to use simulation, and barriers to the use of simulation. Questions relating to process included type of governance structure in nursing program, number of people in charge of simulation in the program, and how simulations are used in the program. Questions relating to outcomes include NCLEX pass rates, student satisfaction with simulation, and student outcomes identified by the program relevant to simulation. The study also collected some demographic information such as size of program, number of faculty, years of HFS use, and years of teaching.

E-mailed questionnaires have become quite acceptable in recent years due to the ease of use and the efficiency in delivering them to prospective participants (Creswell, 2012; Merriam, 2009; Waltz et al., 2010). This also includes the return of completed questionnaires via e-mail. Ethical issues raised by e-mail questionnaires according to Creswell (2012) are privacy of information, and whether the participant has given permission to use their input. Disadvantages of e-mail interviews include the lack of ability to clarify participant responses as well as note verbal inflections of speech that might help to clarify responses (Merriam, 2009).

The prospective participants were asked to respond to the e-mail with the reply function and attach the completed e-mail questionnaire to submit their data. Data were generated through the returned questionnaires in the format of a Microsoft Word document and collected from the completed questionnaires maintaining confidentiality by assigning a number to each participant and keeping a log to provide information to the researcher should any clarification of participant responses need to be obtained. This log is stored under lock and key, in my office in the local university.

My role as researcher was as a nonparticipatory member who was collecting the data and documents intended to be used in the study. No known conflicts of interest existed between myself or any potential study participant. I am currently a registered nurse holding a master's degree working as a full-time faculty teaching in clinical, didactic, and online settings. I have had no known relationships with any participants other than those who may have worked for my university in the past. My experiences with simulation are limited to those experienced at my university setting, where

experience has been minimal in the integration of simulation into our baccalaureate program from its inception. Since I may have biases and personal feelings related to that experience that may affect my findings, I actively reflected on these during analysis of the data gathered from the interviews and documents to preclude bias in the analysis.

Data Analysis

Qualitative data analysis can be accomplished through various approaches, such as conventional, directed, and summative (Hsieh & Shannon, 2005). The design for my study was a qualitative case study using a questionnaire with mostly open-ended questions. Hsieh and Shannon (2005) noted that summative content analysis involves identifying and counting specific words or content in text in order to understand their contextual use. Since this approach to analysis is designed to explore usage rather than infer meaning, it did not align with the purpose of my study to explore perceptions of faculty about best practices for successful integration of HFS into nursing programs. Directed content analysis begins with a theory or relevant research findings to use as guidance for initial codes (Heish & Shannon, 2005). The goal is to validate or extend conceptually a theoretical framework or theory, which was not the intent of my study.

I determined that conventional content analysis was the approach needed for my study design. In conventional content analysis, coding categories are identified directly from the textual data, which was appropriate for analysis of the open-ended responses in my tool (Hsieh & Shannon, 2005). Hsieh and Shannon (2005) noted that in this approach to data analysis researchers do not use preconceived categories. Instead, researchers

immerse themselves in the data and use inductive processes to allow new insights to emerge.

Several authors (i.e., Creswell, 2012; Johnson & Christensen, 2012; Merriam, 2009) have described the first step of data analysis as transcription, but since results from the completed questionnaires were in the format of a Microsoft Word document, this step was omitted. The Word document was a questionnaire that was e-mailed to participants of the study and was returned as a Word document, meaning the participants' responses were already transcribed. As the participants returned their completed questionnaire, the data was already on a Word document in their own words. I logged in each entry as it was returned to me.

Process of Data Analysis

The word documents were copied to facilitate extraction and analysis of data. Hsieh and Shannon (2005) stated that one of the first steps in conventional data analysis is to read all data repeatedly for immersion and to get a sense of the whole, as one would read a novel. I read all responses in their entirety and then reread to begin to formulate thoughts about the data or identification of ideas or themes. Information was highlighted, or cut into phrases that would correspond with identification of these ideas or themes. A reflective journal was also used to document researcher thoughts as well as possible biases that might reflect on the study (Johnson & Christensen, 2012). I made entries into the journal concerning questions or impressions I made as the information was reviewed.

It is important to catalogue each interview questionnaire as it is returned, assigning a number to the entry. The first step was to make an entry into the log and then

make copies of each original questionnaire and store the original on a flash drive for safety purposes. The flash drive will be destroyed after five years.

Data analysis involves reading and rereading in an attempt to develop themes and categories used to analyze the information obtained (Bogdan & Biklen, 2007; Creswell, 2012; Johnson & Christensen, 2012; Merriam, 2009). According to Creswell (2012), "Themes (also called categories) are similar codes aggregated together to form a major idea in the database" (p. 245). In this study, categories that emerged during analysis included incentives to the use of simulation, barriers to the use of simulation, process factors, structure factors, outcome factors, and successful integration. Creswell goes on to say categories emerge as the things participants discuss most frequently and can total five to seven in number.

I began analyzing data as each of the questionnaires were returned from participants to prevent being overwhelmed by large amounts of accumulated data (Merriam, 2009). I read each questionnaire in its entirety and reread to begin to determine impressions related to categories of data that emerge. Journaling was employed to document first impressions, questions, and thoughts generated during the reading. Highlighting of information was done in order to begin to categorize all the information collected. Notes and comments were placed in the margins of the documents.

I read each question to begin to code the information obtained from the study (Bogdan & Biklen, 2007). Creswell (2012) described the coding process:

> The object of the coding process is to make sense out of the text data, divide it into text or image segments, label the segments with codes, examine the codes for overlap and redundancy, and collapse these codes into broad themes. (p. 243)

This coding can be done via cut and paste into a word document or a Microsoft Excel sheet. Graneheim and Lundman (2004) suggested using the entire questionnaire as the analysis piece and extracting categories that relate in words, thoughts, and meanings pulled from the questionnaires. The use of similar words or phrases was used to identify these codes. As the remainder of the questionnaires were analyzed, data helped to support previous identified relationships or identify information and areas needing to be investigated further.

Measures to Assure Accuracy and Credibility

Waltz et al. (2010) described validity in qualitative research as "the truth value or trustworthiness of the data and resultant analysis, interpretation or the extent to which the findings represent reality" (p. 228). Qualitative research should meet criteria proposed by Lincoln and Guba (1985) which includes "credibility, dependability, confirmability, and transferability" (p. 13). There are various means of making sure there is credibility with qualitative research, including member checks, triangulation, audit trails, and saturation (Creswell, 2012; Houghton, Casey, Shaw, & Murphy, 2013; Merriam, 2009).

This study used triangulation as a means of validating the study findings. Documents used were current evidence of best practices from the INACSL (2013), my reflective journal, and the results of analysis of the questionnaires to provide triangulation. I compared the results to the best practices document (INACSL, 2013),

made notes in my journal, and questions or comments on the copies for analysis of the information contained in each returned questionnaire.

The identification of discrepant cases required a closer look at the possible conclusions drawn from the questionnaire data. Questions were examined related to researcher bias to make sure that the data reported were accurate. Member checks were determined to be an unnecessary endeavor, since the author of the responses was also submitting the questionnaire.

Findings

Data were analyzed as each of the questionnaires were returned from participants. The questionnaires contained five areas relating to demographic data. Next were three open-ended questions where participants could write in descriptions and examples. The last four areas were lists for participants to choose an answer or answers that related to their particular situation or an option for "other", where they could provide descriptive information.

Demographic Data

Demographic information provided by participants was reviewed and notes relating to that data made into my personal journal. These notes were my thoughts as I read the information. Demographic data obtained from the questionnaires included gender, age ranges, years teaching didactic and clinical components of the curriculum, and educational degree. The participants were faculty members from five on-ground baccalaureate nursing programs within the Midwestern metropolitan area. One program had four participants, one program had two participants, and the other three programs had

one participant from each. Admissions to each nursing program ranged in number from 50 students per year to more than 200 students per year. All participants were female (*n* = 9); most were older than 56 years of age (*n* = 5); most taught didactic courses between 6 and 10 years (*n* = 5); some taught clinical between 6 and 10 years (*n* = 4); and most had a master's degree (*n* = 7). There were three faculty with less than five years teaching both didactic and clinical components of the nursing curriculum, and one faculty had more than 20-years teaching of didactic content. One participant failed to note her educational level when responding to the questionnaire. Table 1 presents details of demographic characteristics of the sample.

Table 1

Participant Demographic Data

Characteristics	*Frequency*	*Percentage*
Age		
20 – 35 years	*0*	
36 – 45 years	*4*	*44*
46 – 55 years	*0*	
> 56 years	*5*	*56*
Gender		
Male	*0*	
Female	*9*	*100*
Teaching Didactic		
< 5 years	*3*	*33*
6 – 10 years	*5*	*56*
11 – 15 years	*0*	
16 – 20 years	*0*	
> 20 years	*1*	*11*
Teaching Clinical		
< 5 years	*2*	*22*
6 – 10 years	*4*	*44*
11 – 15 years	*3*	*33*
16 – 20 years	*0*	
> 20 years	*0*	
Educational Level		
MSN	*6*	*67*
Ph.D	*1*	*11*
Ed.D		
DNP	*1*	*11*
Teaching now		
BSN	*9*	*100*
ADN	*0*	

Questionnaire Data

No returned questionnaires were encountered where the respondent had not answered all open-ended questions related to implementing simulation into the nursing curriculum. I analyzed the returned e-mail questionnaire data according to the research questions. For the purposes of discussion each participant is referred to with a pseudonym instead of a number. The participants by pseudonym were: Kate, Peggy,

Miki, Jill, Eve, Carla Ciara, Keri, and Sara. The following is a discussion of the findings relating to each of my four research questions.

Research Question 1: How do faculty describe successful integration of HFS into a baccalaureate nursing curriculum? To determine what successful integration is, participants were asked if they thought their nursing program had successfully integrated simulation, what they felt made up successful integration, and to provide a rationale for their answers. Four of the nine participants felt their program had successfully integrated HFS into the baccalaureate curriculum. These four faculty were all from different programs, providing distribution of results. Themes that originated in the analysis of these four participants that reflected successful integration were (a) specific courses using HFS, (b) use of NLN/INACSL principles inside the classroom and clinical arena, (c) a consistent method of debriefing, (d) should begin with a formal written plan, and (e) didactic faculty participation.

Specific courses using HFS. When the four participants who felt their programs were successful, specific courses were mentioned. One participant, Sara, discussed an obstetrics (OB) course and noted:

> Yes, I do think our faculty have successfully integrated simulation into OUR curriculum. BUT, I think that we could always do better (more simulation, more engaged faculty)…Success—content learned in didactic class and applied in clinical setting is reinforced in simulation. Additionally, content may first be applied safely in simulation before being reinforced in the clinical setting. Simulations are not specific to only one clinical setting (such as OB), but may

> have lessons that can be carried across all settings. For example, I designed an OB simulation with hypotension after epidural placement. The objectives of the simulation are not specific to OB, but rather very broad: (1) the student will notice a change in patient status, and (2) the student will use team-based concepts to call for help/utilize resources. Not every student will eventually work in OB, but they will need to pick up on subtle changes in the patient status and mobilize assistance/help in an emergency. The concepts are introduced in an OB simulation, but may be applied in any clinical scenario.

Another faculty who felt her program had successfully integrated HFS was Jill. She wrote:

> Yes, they have started to successfully integrate simulation into their curriculum. Most, if not all, of our undergraduate clinical courses have high-fidelity simulation learning experiences (Adult Health 1 &2, Pediatrics (Peds)/OB, Mental Health, Capstone) in the accelerated and traditional option programs. A non-clinical course also has a high-fidelity simulation experience (Assessment). The MSN-NP program recently added a high-fidelity, intraprofessional simulation experience to their course work as well.

Mikki also believed her program had successfully integrated HFS and noted:

> All the clinical time has simulation incorporated into clinical time for OB/PEDS, Adult health 1 and 2, mental health, critical care and leadership. Most of the faculty that teach look at the objectives of the class and we develop simulated clinical scenarios that go along with the course content. Many of the didactic

faculty also participate in the simulation or give input into what type of clinical scenarios they would like to have the students participate in.

The following comments were made concerning successful integration by Ciara:

> I think that faculty have successfully integrated simulation into the curriculum as much as possible given the following limitations: time (both in the curricular structure and faculty availability), instructor/faculty available to staff the sim lab, lack of physical space, minimal simulation equipment, and variable faculty knowledge of simulation.

Faculty who felt their programs were not yet successful in the integration of HFS noted that they also use HFS experiences in some, but not all, of these same courses. This was noted by Peggy in her written comments:

> I do not think our faculty have fully integrated simulation into our curriculum. We have made a start with simulation in key courses of Adult Health care, Psycho/Social, Maternal Health, and Critical Care. Each course has one to two simulations. Each instructor uses a different debriefing and little if no pre-briefing in the experience.

Eve related that she also does not feel the program has been successful in integrating HFS and stated:

> No, we rarely use simulation. Psych uses it for one scenario, OB uses Noelle, and Critical Care uses it for one scenario. We do not use it for pharmacology or any other courses.

Use of NLN/INASCL principles inside the classroom and clinical arena.

Another theme identified by faculty who felt their program had successfully integrated HFS identified using NLN/INACSL principles.

Jill made mention of INASCL principles as:

> I would define integration of simulation into a baccalaureate nursing curriculum in terms of use of INACSL Standards of Practice in Simulation in clinical courses at each level of the curriculum. Further, I believe that successful, FULL integration of simulation principles across the curriculum would include settings beyond the simulation center and include clinical settings and classrooms.

Ciara also suggested "It would also include faculty members following the best-practices guidelines."

Although Peggy did not feel her program had successfully integrated HFS, she still identified with the use of standards, and expressed it as: "The rationale is the need to integrate simulation design, coordination between the teacher, student and educational practices to improve outcomes as defined by Pamela Jeffries."

A consistent method of debriefing. A consistent method of debriefing was identified as an important factor in successful integration of HFS into the program. Simulation principles include the use of debriefing activities. These were discussed by Jill with the following comment:

> For example, the NLN/INACSL released a statement in June 2015 calling for integration of structured debriefing across the curriculum (outside of the simulation center). This means that structured debriefing principles should/could be used in clinical post-conferences and in classroom settings. In my opinion, full

> integration of simulation into an undergraduate nursing program would include use of its principles both inside and outside of the simulation center itself, can include low/med/high fidelity, should use INACSL standards of best practice, and should include structured debrief in a consistent manner.

Ciara also felt the need for debriefing and her comments reflect its benefits to the students:

> During the simulation, I can carefully observe and think about the students' thought processes without being personally involved in the situation. During debriefing, the students are able to see themselves and reflect on their learning unlike any other situation in the nursing program. Simulation creates self-awareness that is critical to the development of clinical reasoning. Of course it is not a one-shot deal; students don't participate in just one simulation and then it results in perfect performance in critical thinking. However, I have seen it spark changes in student behavior and thinking.

Miki noted the benefits of debriefing in her comments:

> It is very rewarding to get the students input during debriefing. One of the most rewarding simulations is the student's final capstone simulation. The student's come in independently on at a time to manage taking care of a med surg type patient assignment of 3 patients and you watch them, prioritize, critically think, and delegate to both a tech and charge nurse. It is a glimpse into how much progress the students have made since the first experiences in simulation and helps us gage how prepared they are to work in the role of a new graduate.

This sentiment is also evidenced as expressed by Sara who wrote "too little debriefing of students/learners after the simulation" was seen as a barrier encountered in the process of using HFS.

Faculty who felt their program had not been successful in the integration also discussed the use of debriefing as noted by Peggy who wrote: "Each instructor uses a different debriefing and little if no prebriefing in the experience."

Should begin with a formal written plan. Adoption and integration of HFS should begin with a formal written plan. Planning and participation in HFS are very time consuming as noted by participants of this study regardless of whether or not they felt their programs had been successful in the integration of HFS. Planning might best be described by Ciara:

> A successful integration of simulation into a baccalaureate nursing curriculum should begin with a formal, written plan to include appropriate simulation experiences in each semester of the program. The plan should include measurable goals and outcomes that are regularly evaluated by the entire faculty.

A personal experience shared by Sara, discussed working with an established program:

> When I think back on the first time I learned that we would use simulation in our program…I joined a faculty that had already fully embraced simulation and was using it in the curriculum. As a new faculty member, it was exciting to see that simulation was so well-established—our university was definitely an early adopter. Things that helped/made it easier: other experienced faculty, simulation interest group, debriefing training, administration's support of the program

> (purchase of simulators, upkeep, etc.); attending simulation conference and joining [Society of Simulation in Healthcare].

Faculty who felt their programs had not been successful in the integration of HFS into their curriculum also identified the need for planning. Keri shared the following personal experience related to having formal plans in place:

> One year ago I was offered the opportunity, rather abruptly, to develop and fill the role of Simulation Coordinator. I felt that bringing all of the simulations under the umbrella of one faculty member would enable our [school of nursing] to move forward with simulation in a more intentional manner rather than the method we were using, which was each faculty initiating and designing sims they thought would be useful. Because I felt that simulation, as a teaching strategy, was an excellent method to teach critical thinking and was willing to invest my effort (be the champion); I took on the role. Each semester I feel I have had to justify the hours of course release I have been allotted and continue to present information on how and why a simulation plan is important to incorporating this type of learning as an intentional part of our curriculum. I continue with the process because of my strong support of simulation as an active learning strategy that can increase critical thinking in nursing students.

***Didactic faculty participation*.** The next theme identified by participants who identified as being successful in the integration of HFS was participation by didactic faculty. Miki identified faculty participation in her comments:

> Most of the faculty that teach look at the objectives of the class and we develop simulated clinical scenarios that go along with the course content. Many of the didactic faculty also participate in the simulation or give input into what type of clinical scenarios they would like to have the students participate in.

This is echoed by Ciara: "All faculty members understand and support the purpose of simulation education." Jill had concerns about faculty participation and commented:

> Increasing time for simulation on paper looks good, however, if all parties assigned to that role are not putting in the time where is it needed (in the simulation center for prep/turn over/mtc/running sims/prebreif/debrief, then the bulk of the work still falls on one person and burn out is still a high risk which may lead to decreased quality of learning experiences or turn over.

Kate felt her program was not yet successful in the integration of simulation and shared her concerns related to faculty participation:

> I think successful integration would be for all faculty to come to the simulation center and participate/view a simulation a semester. They all need to be aware of what the students are doing in simulation. There is a knowledge gap and a "I'm not a part of simulation, so I don't need to know what's going on" attitude.

Faculty who felt they had not successfully integrated simulation also voiced concerns about faculty participation in HFS. This is demonstrated in Keri's comments:

> No I do not feel at this time that our faculty have successfully integrated simulation into the curriculum. I would define a successful integration as one in which the simulations flow seamlessly from the course objects/program

> objectives, with simulations that are appropriately leveled for content and skill level complexity, and that the simulations meet a learning need specifically identified by the faculty. Additionally, simulation must have buy in from all faculty.

Kate also noted lack of faculty support in her comments:

> I do not feel our faculty have successfully integrated simulation into the curriculum. There is still a notion that what goes on in simulation can't translate into the classroom or beyond the simulation experience. The other barrier is inexperience. I think successful integration would be for all faculty to come to the simulation center and participate/view a simulation a semester. They all need to be aware of what the students are doing in simulation. There is a knowledge gap and a "I'm not a part of simulation, so I don't need to know what's going on" attitude.

In summary, participants identified successful integration as following standards of practice both from the NLN and from INACSL in the development of simulated experiences and of a successful integration. These standards provide a skeleton on which to build. A written plan is a necessary component to successful integration detailing courses, program and course objectives, outcomes and the need for periodic evaluation of the plan. All didactic faculty need to participate in planning, implementing, and evaluating the programs use of HFS. This is also consistent with INACSL Standards as Jill noted , "The NLN/INACSL released a statement in June 2015 calling for integration of structured debriefing across the curriculum (outside of the simulation center). This

means that structured debriefing principles should/could be used in clinical post-conferences and in classroom settings". This would mean that in all areas of the nursing program, a good approach is to add debrief procedures to the classroom, the lab, and the clinical areas.

Research Question 2: What structure factors are related to successful implementation of HFS into a baccalaureate nursing curriculum? Structure factors as discussed by Thompson (2011) in her descriptive study included "numbers and types of simulations. Financial means to purchase simulators, designated simulation space within the lab, and area related questions, as well as incentives and barriers of simulation as perceived by the respondents" (p. 68). Themes identified related to structure factors, which included financial resources, technology specialists, trained faculty/faculty development in HFS and space for the HFS lab. These themes were identified when analyzing participants' answers to Questions 6, 7, and 8 on the returned questionnaires.

Financial resources. The first theme identified was financial resources, which was identified by all respondents except one. Comments specific to this theme include the following comment from Miki "Grants have helped fund equipment…" This was echoed in comments from two other participants. One participant acknowledged grant money to purchase simulators, and lack of funds as a constraint not likely to be resolved in the near future.

Information technology specialist. Another theme that surfaced through the questionnaires was technology specialist which is important in ensuring that the software

of the simulator remains up to date. This person can be very useful when issues arise related to the programming of the manikin. Peggy emphasized the issue when she wrote:

> I am more comfortable with the mechanics of running the equipment and have updated the software and sent the equipment back for repair. I am still apprehensive about some aspects of repair and the fact that our school lacks an IT department dedicated to helping with the equipment.

Trained faculty/faculty development in HFS. A third theme that surfaced from the questionnaire was faculty trained in HFS and was described by some of the participants as a barrier as noted by Kate who wrote "Successful integration would be for all faculty to come to the simulation center and participate/view a simulation." She also noted that faculty "need to be aware of what the students are doing in simulation." She cited "a knowledge gap and a "I'm not a part of simulation, so I don't need to know what's going on" attitude." Kate further explained the particular issue in her program: "Implementing has been difficult due to lack of knowledge." She stated that "structure, style and philosophy behind our use of HFS is solid…the staffing and knowledge is what is lacking."

Faculty training and knowledge is an obvious asset. This was noted in Jill's notation: "I joined a faculty that had already fully embraced simulation and was using it in the curriculum. As a new faculty member, it was exciting to see that simulation was so well-established—our university was definitely an early adopter."

Ciara addressed faculty development as a barrier when she noted "variable faculty knowledge of simulation." Additionally, she provided her rationale "A successful

program would be one in which all faculty members understand and support the purpose of simulation education." She identified her biggest concern as "producing a poor-quality simulation program." What made it easier: "obtaining as much education as possible about simulation and working with other staff members to brainstorm practical application of ideas."

Sara addressed faculty training when she wrote "too few trained instructors with simulation." She commented also about being a new faculty and something that made her experience better was "other experienced faculty." She added in another comment: "Things that made it harder/concerns: lack of personnel comfortable with OB simulations (specialized knowledge)."

Miki addressed vendor faculty development with the following: "Staff stay up to date on high fidelity simulation by workshops and training offered by many of the simulator companies." Peggy identified the same when she wrote "One intervention that made the transition … was the education from the representative from the company to discuss and demonstrate the use of the equipment and instructions on how to use and expand on the software for the program." Eve identified her program as not having successfully integrated HFS. She wrote that "we had very little relevant faculty development," which adds to the identification of this theme as an important concept for the adoption of HFS.

Space for the HFS lab. Space denotes several perspectives. These include available space for building a simulation lab, remodeling space to accommodate a simulation lab, or having space available for housing the simulators, and equipment. This

is another structure factor identified by some as being too small as noted by Carla's description:

> We found the room to be too small, students did not respond well to the simulator as our room did not have any "extra's" like working suction, O2, etc so the students had to "make believe" most of it. On evaluations, they stated that it was too crowded…

Ciara identified "lack of physical space…" as a barrier to integration of HFS and that they had partially dealt with this barrier as they "…separated the room by a ceiling mounted retractable curtain…" She clarifies this statement with "We decided on the curtain to try and maintain the most realistic situation for the students – to try to aid the 'suspension of disbelief' so that they would immerse themselves into the simulation experience."

The respondents were asked about barriers, and themes related to structure factors in the use of HFS included: time (*n* = 7), staff (*n* = 5), training (*n* = 3), familiarity with simulation (*n* = 3), funding/money (*n* = 3), and limited space (*n* = 2). Most of these barriers/themes were also identified and discussed above. Table 2 presents the specific numbers related to barriers identified by participants with comments provided from respondents.

Table 2

Themes Identified as Barriers in the Use of HFS

Barrier	Specifics	Number of responses
Time	• To plan, perform, and wrap-up and use HFS to its full	7

	potential • In the course to assign 5 students to the lab for large class sizes • To assist with each simulation • To design, train faculty, and debrief • Time in both curricular structure and faculty availability	
Staff	• Lack of trained staff • Inexperience • Designated coordinators • Faculty	5
Training	• Lack of trained staff • Variable staff knowledge • Too few trained instructors	3
Familiarity with simulation	• Inexperience with simulation • Knowledge of designing simulation experiences	3
Funding/money	• Staff hours and equipment costs • Lack of money • Minimal equipment	3
Space	• Limited space	2

In spite of these barriers, four of the respondents felt they had successfully integrated HFS into their curriculum, so I looked at the ways they had been able to move past the barriers. Faculty who felt their program had successfully integrated HFS affirmed the need for more staff as noted by Jill:

> This work requires full time hours on top of my didactic course responsibilities and other faculty responsibilities (committees, advisor, etc.). Therefore, I have noticed a high risk of burn out in myself and have felt its effects. So, barriers are time and staffing. To continue the pace and high quality work/learning experiences for students, I simply cannot continue to do this work on my own. I need help in the form of staffing someone for the simulation center who will be able to help on a regular basis. Increasing time for simulation on paper looks good, however, if all parties assigned to that role are not putting in the time where

> is it needed (in the simulation center for prep/turn over/mtc/running sims/pre-brief/debrief) [preparation for the simulation, turnover to the lead faculty, monitor the class, run the simulations, prebrief the participants, and debrief the participants], then the bulk of the work still falls on one person and burn out is still a high risk which may lead to decreased quality of learning experiences or turn over.

This barrier was overcome as Jill noted:

> I met with the director and the dean to discuss the issue and provided the dean with my hours tracking from the prior 8 months. I expressed all of the concerns regarding time, staffing, increasing simulation use, workload, and the student learning experience quality. We are getting another part time person.

High fidelity simulation is known to be an expense to the nursing program. The simulators, staff, education, and equipment are extremely high costs for schools to bear. Expense in staff hours and equipment was noted as a barrier by Miki in her statement:

> Simulation is expensive both in staff hours and equipment. Grants have helped fund equipment and ongoing training have kept staff stay up to date on high fidelity simulation by workshops and training offered by many of the simulator companies.

Space is another potential barrier to a successful integration of HFS. Some facilities had space, while others had to remodel space previously used for other things into a lab to house simulation. This is noted by Ciara as she stated:

> A barrier that I think we have dealt with successfully is limited space. We have two simulation manikins and only one room. We separated the room by a ceiling mounted retractable curtain, like the ones in hospital rooms. This gives us the flexibility of setting up the room for either med-surg (Sim Man) or OB (Noelle). The unused manikin is hidden behind the curtain during a simulation. We decided on the curtain to try and maintain the most realistic situation for the students – to try to aid the 'suspension of disbelief' so that they would immerse themselves into the simulation experience.

The respondents who felt their programs had not successfully integrated HFS named some of the same barriers. Peggy noted that time was a barrier when she stated:

> Our program has not progressed past this barrier because of lack of funding and faculty to be able to dedicate a faculty member to full time simulation. Due to budgetary constraints I do not see this being resolved in the near future. We have only partially moved past this barrier by putting in more over time, working on courses on the weekend and working up to 14 hour days. Unfortunately, this can lead to "burn out."

Carla noted limited space, as she stated:

> Space for our simulation is too small to hold more than about 5-6 students. They do not always have a role, expect as observer. Since the class may be large of 50 students, there is not enough time in the course to assign 5students to the lab and as the instructor not enough time to assist with every simulation. I have since taken the simulator to the classroom or larger room to conduct teaching

> simulations. I divide the group of 50 into half, then into 3 groups and have stations leading up to the simulation.

Simulated experiences require sufficient time to write scenarios, set them up in the lab, conduct the simulated scenarios, and then to debrief them. These issues have been noted by faculty as a barrier to the use of HFS. Eve discussed barriers encountered in her program when she stated:

> One of our barriers is that one faculty person has tight control over the use of simulation and this limits our use; another is that we simply do not have enough faculty nor time to use HFS to its full potential. Another barrier is that there are not enough appropriate scenarios to draw from; I had to completely create the scenario I use myself and this was very time consuming and without compensation.

She also noted that HFS was adopted for "publicity and recruitment purposes." Sara noted "too few trained instructors with simulation" as a barrier to its use.

In summary, both participants who cited success and those who did not, both agreed that inadequate time and knowledge related to the use of HFS are significant barriers to its use. Success may be defined in the ways in which participants found to circumvent these barriers. The lack of knowledge was addressed through staff development in the form of conferences, learning from other faculty, and joining support sources. Time was addressed by working overtime, on weekends, and utilizing 14 hour days. Some instances of lack of time resulted in the hiring of part-time helpers. Although all participants had funds available for purchase of simulators, a barrier

included “insufficient funds” for appropriate equipment and the ability to maintain equipment. One participant noted lack of information technology to support the use of HFS in the school of nursing.

Research Question 3: **What process factors are related to successful implementation of HFS into a baccalaureate nursing curriculum?** Process factors as noted by Thompson (2011) were “those things that guide the development of nursing programs so organizational goals are met” (p. 68). This would include faculty development, faculty in charge of simulation, and the specific courses etc. where simulation has been integrated into the curricula. This would also encompass the process by which decisions are made at the particular nursing program. Answers from Questions 6, 7, 8, and 11 of the questionnaire were analyzed to provide themes. Themes identified fall into three areas: governance, support and curriculum.

***Governance*.** The questionnaire provided descriptors for possible answers. The choices provide under this section included: (a) administration, (b) faculty, (c) College/University, (d) unionized/nonunionized, (e) decision-making body at university and school of nursing, (f) research-based institution, and (g) adult learning. When asked what process factors contributed to adoption of HFS, eight participants responded that they are a college/university. They also cited administration as a contributing process factor to adoption of HFS.

Curriculum. The questionnaire provided descriptors for this section, which included (a) 18-month, (b) 2 year, (c) 4-year, (d) accelerated option, (e) concept-based, (f) simulation assisted courses, (g) simulation used as clinical hours, (h) simulation used

as an adjunct to clinical hours, and (i) simulation used to teach skills only). Eight respondents replied that curriculum was a process factor, and three of the eight responses specified the type of curriculum, noting "18-month program," "clinical adjunct," and "HFS as clinical hours" in those responses. Jill commented "Most, if not all, of our undergraduate clinical courses have high-fidelity simulation learning experiences (Adult Health 1 &2, Peds/OB, Mental Health, Capstone) in the accelerated and traditional option programs." Another response was "The MSN-NP program recently added a high-fidelity, intraprofessional simulation experience to their course work as well." Another commented on the curriculum with the following statement "…simulation incorporated into clinical time for OB/PEDS, Adult health 1 and 2, mental health, critical care and leadership."

Support. Two respondents noted support as a process factor contributing to adoption of HFS. Support and decision making can be both a positive aspect and negative influence. Lack of support can be seen in Ciara's comment:

> …I felt entirely overwhelmed. That feeling grew when I realized the limitations we were given … but were still told "make it work!" It was hard to overcome the attitude that our bosses expected the impossible without giving us support of time and money. My biggest concern was producing a poor-quality simulation program.

Other barriers that were identified under support include "scheduling", "tight control by 1 person", and "communication." Jill identified a communication barrier in her written comment:

> I was left to prepare a simulation, conduct pre-brief, run the simulation, and conduct a debrief for learning experiences in which I was not getting forthcoming communication from the parties involved in its development (which I was not included). I felt frustrated trying to determine what was needed in order to prepare items needed for the simulation (moulage, chart information, medications, etc). I requested communication several times and it was like pulling teeth to get anything. I did what I could to prepare for the simulation by looking up hospital protocols regarding what they MIGHT need and just prepared for ALL eventualities since I wouldn't know what they would need. I thought, that way, I would be mostly covered for anything. In the end I spent over 30 hours preparing for the simulation as best as I could and it was not of a quality I would be proud of.

Jill's reference to moulage indicates a French word that addresses the ability to make the manikin appear to have real injuries, wounds, bruising, or coloring. It is accomplished through the use of water-based dyes, cosmetics, or things that can be made cost-effectively in a person's own home. This allows for a more realistic appearance so that students can realistically interact with the experience and manikin.

Another process factor under the theme of support included simulation scenarios. These were identified as a barrier that was overcome by Eve. She wrote, "There are not enough appropriate scenarios to draw from; I had to completely create the scenario I use myself and this was very time consuming and without compensation."

Large class size. A barrier that also fits into a process factor is large class size. One participant provided the following comment concerning classes of 50 or more students: “There is not enough time in the course to assign five students to the lab and as the instructor not enough time to assist with every simulation.” Another participant identified the need for “More time to implement simulation scenarios for the LARGE class sizes that we have.”

Support has also been a process factor identified as positive to the adoption of HFS identified by Sara who wrote “Things that helped/made it easier: …administration’s support of the program (purchase of simulators, upkeep, etc.)…” This is echoed by one participant who described addition of many new simulation experiences. She credits this to work ethic, administrative support, and positive faculty response to HFS. Others acknowledge positive administrative support in regard to continued release time for HFS.

Incentives to adopt HFS. Faculty seemed to be an overriding example of a process factor. It seemed to be both an incentive and a barrier to the adoption of simulation. It was identified by those who felt their program had successfully integrated HFS as well as those who felt they had not successfully integrated HFS.

Faculty who felt they had successfully integrated simulation identified an incentive factor as student learning. Two participants identified looking at what the students achieve through HFS experiences. They describe them as “ah-ha” moments for students. These are times when faculty are able to observe student performance and “know” that the student understands a concept or is able to “think through” a situation to determine their best course of action.

Safety is another factor that can be accommodated in the simulation lab. Participants described instances where the risks are highest in the real-world setting. These situations can be safely encountered in the HFS scenario conducted in the lab. Sara commented "it just makes sense that we would want to simulate high-risk, low-frequency situations on manikins, rather than experiencing the situation for the first time with a real patient."

Other incentives identified by those who felt their nursing program had not successfully integrated simulation were gaining the funds and patient safety. Participants commented that students can take on the professional role of the nurse in the simulation lab. Students can learn about critical situations "risking actual harm to a patient." Clinical make-up experiences were discussed. When students were unable to complete clinical, due to unforeseen circumstances, they can be given a HFS experience. Eve identified an incentive as "Seeing how a scenario could be of practical use for student learning and using HFS was the best way to teach the content."

Specific courses identified by participants where HFS has been added included: Adult Health 1 &2; Pediatrics; Obstetrics; Psychosocial Nursing; Critical Care; Leadership; Mental Health; Assessment; and Capstone. One participant also discussed the use of HFS in advanced programs such as MSN-NP programs where interprofessional communication was stressed. Not all participants discussed the use of simulation in specific courses.

In summary, it seems that all or most courses with clinical components contain HFS experiences in the nine participant's program curriculum. Trained and sufficient

faculty members to facilitate HFS are still a concern, even for those participants who identify as having successfully integrated HFS. Participants' described numerous incentives that motivated them to use HFS in the various programs represented in this study. Two participants identified support as a contributing process factor and both of these participants also identified their program had successfully integrated HFS into its curriculum. Several participants identified things such as patient safety and student learning as factors that encouraged them to adopt HFS as a teaching strategy in their curriculum.

Research Question 4: What outcome factors are related to successful implementation of HFS into a baccalaureate nursing curriculum? This question requested information relevant to both student outcomes and program outcomes. Outcomes are the end product the program and courses would like to see improved upon with the integration of HFS. Respondents were given choices in Questions 12 and 13 of the questionnaire. These questions asked what outcome factors (student outcome factors in #12 and program outcomes in #13) have you seen improve since integrating HFS into your baccalaureate program? I will discuss student outcomes identified as relating to successful implementation of HFS into their programs. Themes identified using their answers from Question 12, fall under three areas: testing scores, critical thinking, and evaluations.

Improved test scores. The theme of improved test scores would encompass course testing and standardized testing. Only one respondent identified improvement in

course testing scores. None of the respondents identified an increase in the student's ability to pass standardized tests since adoption and integration of HFS.

Critical thinking. The theme of critical thinking was identified as having improved with the adoption of HFS. This theme encompasses (a) employer satisfaction (n = 1), (b) clinical performance (n = 4), and (c) critical thinking (n = 4). Miki identified critical thinking in her comment about the student's last capstone simulation when she commented "you watch them prioritize, critically think and delegate to both a tech and charge nurse." Ciara made observations about critical thinking when she commented:

> Simulation creates self-awareness that is critical to the development of clinical reasoning. Of course it is not a one-shot deal; students don't participate in just one simulation and then it results in perfect performance in critical thinking. However, I have seen it spark changes in student behavior and thinking.

Critical thinking can also be seen in Peggy's comments:

> What really makes me want to use HFS is the opportunity to let nursing students take on roles of professional nurses and learn from both the preparation and integration in a critical situation without risking actual harm to a patient. I believe it is important to let students make mistakes in this setting to help them analyze their behavior and learn from the mistakes in a safe environment.

Clinical performance was also a student outcome factor identified in Sara's observation: "content learned in didactic class and applied in clinical setting is reinforced in simulation. Additionally, content may first be applied safely in simulation before being

reinforced in the clinical setting." Miki addressed clinical performance in her written comment:

> One of the most rewarding simulations is the student's final capstone simulation. The student's come in independently on at a time to manage taking care of a med surg type patient assignment of 3 patient … It is a glimpse into how much progress the students have made since the first experiences in simulation and helps us gage how prepared they are to work in the role of a new graduate.

Evaluations. The evaluation theme included (a) course evaluations (*n* = 3), (b) clinical performance (*n* = 4); and (c) evaluations of the simulation experience (*n* = 6*)*. This is evident in Jill's written response "The increased positive evaluation from students and their requests for more experiences the biggest impact on HFS use in the curriculum."

Eve commented:

> HFS is a very expensive product that has really made no difference in any of the above that I am aware of. We do not use it our advantage, for the reasons given above, and have not researched student outcome factors.

Respondents were also asked what program outcomes factors have improved with the integration of HFS into the program. They were provided with a list of program outcomes to choose from. Themes were identified based on analysis of their response to Question 13 and include objectives; evaluations, and debriefing.

Objectives. The first theme identified was objectives (*n* = 8*)*, and included (a) clinical objectives (*n* = 4), (b) student learning objectives (*n* = 2) and (c) program

objectives (*n* = 2). This can be exemplified with Jill's observation "objectives of the simulation are not specific …, but rather very broad": (1) the student will notice a change in patient status, and (2) the student will use team-based concepts to call for help/use resources."

Evaluations. One theme identified as an improved program outcome was evaluations, which can be student evaluations of course design (*n* = 1) and student evaluations of HFS (*n* = 5). This can be seen in the following comment provided by Jill: "increased positive evaluation from students and their requests for more experiences the biggest impact on HFS use in the curriculum along with the national study results."

Debriefing. The last theme identified was debriefing (*n* = 6) which can be noted as Jill writes "…the "ah ha" moments for the students. Knowing that they "understand" from their time in the simulation experience is rewarding and can make all the other behind the scenes work or frustration worth it" this is also echoed in Keri's statement: "I see it on the faces of the students when they have that "ah ha" moment of learning." She went on to say it is usually during the debriefing when these students realize what they have learned. This is echoed by Ciara also noted debriefing in her comment: "During debriefing, the students are able to see themselves and reflect on their learning unlike any other situation in the nursing program."

Participants who felt they had successfully integrated HFS and those who did not marked some of the same factors. I found it interesting that although improvements in NCLEX scores and standardized testing were choices they could have selected, none of the participants marked these as having improved with the use of HFS. It may be that the

HFS programs are new enough that this correlation has not yet been seen, or there may not be any changes in these areas.

In summary of Research Question 4, several different factors were marked by respondents as improvements seen after implementing HFS. Analysis of data for this study revealed no indicator in the program or student factors specific to the successful integration of HFS. Improvement of standardized testing was a potential choice for both student and program outcomes, but was not chosen by any of the participants of this study. Improved NCLEX pass rates were also not chosen as an improvement seen in program outcomes.

Findings of the study showed that four of the nine participants felt they were able to successfully integrate simulation and five of the nine participants felt they had not successfully integrated simulation. All participants identified barriers; several were able to progress past these barriers and successfully integrate simulation. Various incentives were identified that propelled programs to successfully integrate simulation. Other participants stated that they continue to face substantial barriers but have found ways to make the situation work for now. As one participant noted, simulation "does what you want it to do and facilitates the learning you want the students to achieve".

Out of the nine questionnaires, there were no outliers or discrepant cases. All respondents provided detailed personal descriptions of their actual experiences in their respective programs. All respondents identified their roles in working with HFS in their respective programs. All information provided aligned with the research questions of the study.

Discussion

The literature is robust with information relating to barriers encountered in the use of simulation (Adamson, 2010; Akhtar-Danesh et al., 2009; Anderson et al., 2011; Howard et al., 2011; Jansen et al., 2009; Jansen et al., 2010; Kardong-Edgren et al., 2008; King et al., 2008; Nehring et al., 2013). These identified barriers include: (a) faculty training in use of simulators as well as in the development of scenarios for simulated experiences, (b) time factors relating to writing scenarios and using HFS, (c) adequate space and supplies, (d) student numbers for accommodation and scheduling of HFS experiences, and (e) scheduling around courses, clinical, and other student activities. Many of the barriers identified in this study concur with those of previous studies, adding to the current knowledge. Several themes were singularly identified by respondents such as: (a) scheduling, (b) communication, (c) maintenance, (d) too few scenarios, (e) one person control of simulators, (f) insufficient equipment, and (g) too little debriefing.

These same issues were documented in *Standards of Best Practice: Simulation* from INACSL (2013). Standard I defined "environmental fidelity" as "the degree to which the simulated environment (manikin, room, tools, equipment, moulage, and sensory props) approximates reality" (p. S6). This speaks to some of the structural components of the simulation programs which were studied in this case study. Fidelity reflects realism, which is difficult to accomplish in programs lacking equipment and supplies as well as qualified staff. INACSL noted:

> Fidelity can involve a variety of dimensions, including (a) physical factors such as environment, equipment, and related tools; (b) psychological factors such as

> emotions, beliefs, and self-awareness of participants; (c) social factors such as participant and instructor motivation and goals; (d) culture of the group; and (e) degree of openness and trust, as well as participants' modes of thinking. (p. S6)

One participant of this case study suggested:

> A successful integration of simulation into a baccalaureate nursing curriculum should begin with a formal, written plan to include appropriate simulation experiences in each semester of the program. The plan should include measurable goals and outcomes that are regularly evaluated by the entire faculty.

Alexander et al. (2015) developed guidelines for prelicensure programs of nursing in the use of HFS based on the results from the NCSBN study and the suggestions of an expert panel. The panel of experts consisted of members from BONs, INACSL, AACN, NLN, Society for Simulation in Healthcare (SSH) and NCSBN who all together "developed national guidelines for use of simulation in the undergraduate nursing curriculum" (Alexander et al., 2015, p. 39). They used INACSL's *Standards of Best Practice: Simulation* and other peer reviewed resources to establish these guidelines. The guidelines suggest having a written plan describing simulation resources and equipment, physical space, qualified simulation faculty, short and long-term objectives for integration of simulation, budgetary plans for the beginning and sustainment of the simulation program as well as a letter from administration that they support and will provide necessary resources to maintain the program.

A consistent form of debriefing was also an area discussed by participants in this case study. Participants made comments about not having consistent forms of debrief

and not doing enough debriefing of learners/students after simulation. The adoption of a consistent form of debriefing that encompasses classroom, lab, and clinical curricular design is highly encouraged as noted by Alexander et al. (2015).

Taplay, Jack, Baxter, Eva, and Martin (2015) conducted a study in Canada relating to the process of integrating simulation into undergraduate nursing curricula. Their findings provide a rich background for the addition of information from this study. Taplay et al. identified a seven-phase process to the integration of simulation and discovered through their research that planning and continued education in the use of simulators plays a large part in the successful integration of simulation. The phases they identified were (a) obtaining the funds, (b) developing the role of simulation leader, (c) putting the components together once delivered, (d) learning about simulation and the use of it as a teaching strategy, (e) determining inclusion of HFS in the curriculum, (f) learning the equipment, and (g) designing the scenarios for curricular placements (Taplay, Jack, Baxter, Eva, & Martin, 2015).

The study by Taplay et al. (2015) aligns with information obtained in my case study relating to planning the space and procuring funds. Some of the schools surveyed had to procure funds to purchase simulators using grant monies as did the Canadian school. Some had to design and remodel spaces for their simulation labs or build new spaces. Each lab had to procure equipment in order to suspend reality and make simulated experiences as real as possible. Staff development was also needed as not all faculty had worked with simulators in the past and some were even taking on the new position of simulation lab coordinator. This staff development was obtained training

through conferences, seminars, classes, and training from the vendors in the use of HFS, design of the scenarios, use of the equipment, and map HFS into the existing curriculum.

Some of the participants in my study discussed having written a job description for the role of simulation coordinator and then were given the position. Masters (2014) described having no strategic plan in the nursing program, and no one specially trained to work with the HFS, yet they had purchased the simulator. The faculty did think simulation sounded like an excellent idea, so one faculty who had minimal work with HFS was given the responsibility to work for one semester with simulation instead of clinical. The student rotated through a simulated experience twice during the semester. The school then wrote a grant proposal to put two students from each clinical group through a simulated experience each week. This resulted in funding to hire two full-time faculty to facilitate simulation in their program.

The second phase of integration as described by Taplay et al. (2015) was that of developing the role of simulation leader. These authors stated "a leader is required to implement, manage, and coordinate a project of this magnitude." (p. 29). This phase may require reallocation of workload to support faculty placed in this role or orientation of new faculty members hired into this role. Some participants in my study identified a laboratory coordinator or leader was a barrier not yet accomplished. One participant listed this as an integral part of a successful integration of HFS into the nursing program. Another noted having multiple faculty assigned with only 10–15% of their workload involved with simulation, which was a barrier not yet overcome.

The third phase described by Taplay et al. (2015) that of getting the simulator out of the box and put together, is many times a difficult stage to accomplish and in some cases required inside pressure (administration, faculty members, etc.) and/or outside pressure (program accreditation, other schools, or the need to develop new curriculum). Leigh and Hurst (2008) who noted a two year lapse between the time the simulators were purchased and the time that faculty actually began to use them. Thompson (2011) in her descriptive study found that respondents reported that simulators had "full functionality between 0-3 months" (p.72). Taplay et al. described nursing schools who were up and running within two years and some that took up to eight years to accomplish this task. Masters (2014) described the journey of their nursing program. They began with no "simulation champion" and no strategic plan. It had been seven years at the time the article was published and they still had not accomplished what they had wanted to accomplish in the beginning. My study did not ascertain the number of years each of the programs had been working with HFS.

Taplay et al. (2015) identified the fourth phase as "learning about simulation and its potential for teaching" (p.30). Learning occurred on a continuum throughout the process of simulation. Administrators and faculty were involved in learning simulation and how to use the specific simulators. Accommodating workloads was acknowledged as necessary for the successful use of this teaching strategy. This seems to be a problem identified by respondents in my study as noted by discussion of overtime, working on weekends, requests for additional help in the lab, and the potential for burnout.

Participants in this case study identified numerous courses that have integrated simulated experiences into them. Most of these courses (Pediatrics, Obstetrics, Medical/Surgical, Nursing Assessment, Critical Care, and Leadership) would usually have a clinical component. This is reinforced with the results described in the study done by Taplay et al. (2015). None of my participants concluded that more courses were necessary for successful integration of HFS.

Some participants talked about learning the equipment and learning how to conduct a simulated experience. Taplay et al. (2015) separated this into two distinct phases. Vendors usually provide training on the use of each specific simulator. This allows faculty to "play" with the equipment to see if it is easy or difficult to use.

Other participants discussed the potential for a lack of communication between course didactic faculty and those doing simulations. Masters (2014) discussed the fact that two new faculty were hired to conduct simulated experiences full-time in their nursing program. They were also sent to the Simulator training center for in-depth training that occurred over a week's time. This caused problems as the faculty teaching courses in which HFS had been programmed were not the same as faculty providing the simulated experiences. There existed a "disconnect" between the two groups concerning the experiences and objectives of the course, preparation prior to the simulated experiences, and evaluations done by students during the simulation. Participants in my study called this a lack of communication. Jill described her first experience with simulation as taking a job with no simulation experience and being asked to "use the simulator to give them something." She was scared due to the expense of the equipment

and her inexperience. Another participant voiced concern about the quality of simulated experiences when the didactic faculty does not communicate the needs and specifics of a particular simulation experience with the person conducting the simulation.

Learning the equipment is also a phase of the integration of simulation. This is usually done by the vendors shortly after delivery of the equipment (Taplay et al., 2015). Carla wrote about training with another faculty then finding she was left to handle the simulator on her own without assistance due to workload constraints. Due to space constraints it was determined the simulation worked better in the classroom as a learning technique instead of a simulated experience. Maintenance can become an issue, as discussed by participants of my study, as an obstetrics experience was difficult to portray to students who could not see "blood" in a hemorrhaging obstetrics scenario. Another participant discussed sending the simulator back for repairs, and updating software. One participant of the study did identify lack of informatics specialists as a barrier only partially overcome.

Conclusion

The questionnaire for this case study was distributed to five participating baccalaureate nursing programs. Initial requests to participate in my study were sent to 22 faculty members in the metropolitan area. One of the e-mailed requests were sent back stating that faculty had retired and one faculty member stated that she no longer used HFS in her course, so declined to participate. One prospective participant sent back names of two persons I had already contacted stating she was not the appropriate person to complete the questionnaire. One person simply stated they could not participate. Five

prospects never replied even after two more requests 2 to 3weeks apart. Four people responded they did not use simulation.

I obtained nine completed questionnaires for my analyzed results. I do not believe saturation was met, as I was still receiving new information on some of the returned questionnaires. For example, on my last returned questionnaire information was submitted from someone who joined a program that had already fully integrated simulation into their curriculum. As far as I could, tell that was the only completed questionnaire from someone in that situation. The last questionnaire did not elicit any new information about the themes identified.

Of the nine returned questionnaires, four felt their schools had successfully integrated HFS into their curriculum, and five felt they had not. Successful integration was discussed by all respondents and rationales were given by each related to why they felt as they did about the success of their programs. All program participants identified barriers and there were discussions about how some programs overcame the barriers. One respondent noted that simulation is “a very expensive product” and because this is true, great care should be used in the planning involved in integrating it into the curriculum.

Analysis of the data obtained in this study suggests the faculty all need to be involved and to participate in simulation to determine if course objectives are being used to develop the simulated experiences and to determine if content covered in class is carried over in the simulated experience. The faculty also needs to understand how high-fidelity simulation is used and what it is capable of reinforcing from classroom to

clinical. This requires faculty buy-in, so all faculty should have a voice in developing simulation in the curriculum.

Participants felt success was measured in five areas: courses that used HFS, faculty participation, use of principles established by NLN/INACSL, consistent debriefing practices, and a formal written plan. Even participants who felt they had not successfully integrated HFS described the need of these same components. The courses listed by participants included Obstetrics, Adult Health Care, Mental Health, Critical Care, Leadership, Pediatrics, Capstone, and Psychiatric Nursing.

All but one of the participants mentioned structural factors such as financial resources contributing to the implementation of HFS. All but two identified space as a contributing factor to its implementation. Barriers to implementation included, (a) lack of information technology support, (b) lack of time and resources to support HFS, (c) lack of faculty experience and knowledge, (d) lack of faculty buy-in, and (e) limited space. These are factors that need to be considered when contemplating adoption of HFS into a nursing curriculum. Information was also relayed about what had been done to overcome the barriers identified.

Process factors that were identified as helpful to the implementation of HFS included the governance of the college or university (n = 8) and the curriculum itself (n = 8). Two of the nine participants identified support as a factor contributing to implementation. Participants identified being able to obtain faculty development, observing the student's critical thinking and behaviors during simulated experiences. Training on debriefing was also identified.

When discussion of outcome factors was used, I divided the answers into student and program outcomes. Participants identified evaluations of the simulated experience (n = 6), clinical performance (n = 4), and critical thinking (n = 4) as the highest student outcome factors. Other identified student outcome factors include evaluations of the course (n = 3), and one each for employer satisfaction and course testing scores. The highest program outcomes included debriefing (n = 6), the evaluations from students of the HFS experiences (n = 5), objectives for clinical (n = 4), objectives of the program (n = 2), outcomes of student learning (n = 2), and last evaluation by students of the course design (n = 1).

The information obtained from this study adds to current literature about barriers, but it also describes how some baccalaureate nursing programs have overcome barriers to successfully integrate HFS into the curriculum. Many of the barriers described in my study addressed the lack of knowledge as it relates to HFS. Lack of knowledge about the use of HFS, therefore, appeared to be the best starting point. The findings of the study were used to develop a set of three training modules to help programs facilitate integration of HFS into the baccalaureate curriculum by first providing the education about simulation to their faculty.

In the next section, I will describe the details of the proposed project noted above. Successful integration of simulators and simulated experiences into nursing curricula would be a fundamentally sound endeavor to ensure that all components for success are currently in place before spending the capital to invest in these expensive simulators. Plans for the development of a simulation lab include: (a) is there currently enough space

available to develop the lab, (b) what type simulators are needed, (c) how many simulators will be needed, (d) what courses and scenarios will be used for simulation, (e) how many faculty are currently trained in the use of HFS, (f) how many faculty will need training, (g) how many supplies will be needed, (h) will there be a lead person in charge of the lab and simulated experiences, (i) are there currently available information technology personnel for HFS or will someone need to be hired for this position, and (j) how much money will be needed to accomplish the planned lab, etc. Job descriptions need to be written as do policies for the lab itself.

Section 3: The Project

Introduction

The purpose of my study was to identify faculty perspectives of best practice elements that made the integration of simulation successful in an undergraduate nursing program. In this section, I will describe the proposed project designed to address faculty development related to the use of HFS in nursing education. Findings from the study provided evidence that nurse educators are in various stages of the integration process in using HFS. Faculty development is a way to help them progress through the remaining steps to successfully integrate HFS into their curriculum.

The structure-process-outcome model ascribed by Donabedian (2003) and used in this study identifies structure as the material aspects such as classrooms and space, equipment including the simulators, and faculty trained or experienced in application of HFS simulation. Process is designated as the way decisions are made and type of personnel hired; support as in administrative backing and appropriate funds to maintain the simulation program and fund an information technologist to support the program; curricular matters, such as length of the program courses offered; and clinical aspects, such as substitution for clinical hours or in addition to clinical hours (Donabedian, 2003). Outcomes are the changes occurring as a result of adding simulation to the curriculum. These may be better test scores, both standardized or course related; better employer satisfaction; better abilities of students to meet course and clinical objectives; or an improvement in critical thinking by students. Some structure factors identified in this study as barriers included lack of space and resources (funds; information technologist,

coordinators, or specialists). Process structure factors identified through the study as barriers included lack of an information technologist as well as lack of simulator warranties and updates. Outcome factors identified as barriers in the study included lack of knowledge about debriefing, as well as not doing enough debriefing. These findings were used to identify areas of interest in the development of the three training modules: the planning of a simulation program, scenario writing, and debriefing. Each module covers a component identified in my study.

Description and Goals

The faculty development program, I designed as a result of the findings presented in Section 2, addresses several issues. Many nursing programs currently have added simulation to their curriculum. My analysis of the data collected through the questionnaire of my study identified barriers to successful integration of simulation as: (a) staff (5 of 9 respondents), (b) training (3 of 9 respondents), and (c) familiarity with simulation (3 of 9 respondents). Other participant responses on barriers to successful integration of simulation included lack of space, lack of funds, minimal equipment, limited scenarios, and maintenance of equipment. Time for planning, performing, wrap-up and debriefing were also elicited as barriers from the study questionnaires, even though each nursing program within my study currently has a simulation lab.

The project I developed was an online faculty development program that will be provided in three online modules to be completed over a 6-week timeframe, allowing two weeks per module. This format was chosen because it is asynchronous, allowing for the participation of busy nursing faculty whose varied schedules might make it difficult to

attend prescheduled presentations at specific times. The online format also allows faculty to access the modules repeatedly in order to review information that they may have forgotten. Each module was developed to accommodate a 2-week timeframe also to accommodate asynchronous participation from busy faculty. Module 1 will pertain to adopting simulation and making a plan; Module 2 will pertain to scenario writing for simulated experiences; and Module 3 will identify debriefing research and provide videos showing debriefing after the simulated experiences.

The proposed faculty development project will address the adoption of simulation, scenario writing, and debriefing. The goals of the faculty development program are to explain the pedagogy of simulation, what types of simulators are available, the necessary components of a simulated scenario, and the elements necessary for appropriate debriefing and student learning to occur. The participants will be asked to begin by taking a pretest to determine their current knowledge. At the conclusion of the 6-week program, they will be sent an e-mail containing a link to complete an evaluation of the program, located on SurveyMonkey.

Module 1 will define simulation as a pedagogy that involves the use of manikins that closely resemble the human body or portions of the human body for the purpose of teaching and learning skills. Healthcare workers perform specific skills related to functions of the human body. Some of these include inserting intravenous lines, urinary catheters, nasogastric tubes, and other skills performed by healthcare workers. Some of the high-fidelity simulators can be programmed via computer to react to human interventions, allowing students to affect changes to alter patient outcomes (Leigh &

Heurst, 2008; Meakim et al., 2013; Rothgeb, 2008; Seropian, Brown, Gavilanes, & Driggers, 2004). The module will also cover use of equipment such as the manikins; hospital type ancillary equipment (beds, over-bed tables, suction and oxygen equipment, intravenous medical supplies, etc.); plus audio and video recording equipment. The faculty participant will have a 2-week timeframe to write up a partial business plan (components discussed in the module) that would be appropriate to their nursing program. These business plans will be e-mailed to me for feedback by the first day of the second module, beginning on Week 3.

Module 2 will provide information and resources for writing simulated scenarios for experiences in their specific course. Resources will provide available templates, how to write learner objectives and outcomes, as well as specific student behaviors that will be expected in the simulation. Participants will be expected to submit to me a scenario that has identified the outcome for the simulation, student objectives, and a flow of the scenario with three potential endings appropriate to their course content.

Module 3 will address debriefing research and phases of debriefing and provide faculty with a few YouTube videos to provide examples of debriefing. The participants will be asked to formulate an outline of possible areas to discuss in the group format of debriefing. This will again be e-mailed to me for feedback. Participants will receive an e-mail with a link to complete a survey about the course on SurveyMonkey.

This plan covers several themes identified in the literature and in my study that have been identified as critical elements of the simulation experience for students. The first module provided for the development of a formalized plan to begin HFS in a nursing

curriculum. The second module provided for information to help determine the elements necessary for a good HFS scenario. The third module provided information on the debriefing process after the HFS scenario has been developed and implemented with students. Each module will also contain resources and references for further investigation by the participants.

Rationale

Educators are being challenged to develop means to engage students actively in the learning process. Simulators have become a new means of eliciting active participation of the student in the skills of nursing, providing application of the didactic portion of their education in a simulated environment, and providing an opportunity to reflect on circumstances occurring in the learning process to become critical thinkers in the clinical setting (Rothgeb, 2008). For faculty and students to achieve the best outcomes possible in the use of this teaching strategy, the faculty need to understand the concepts required in the development of a simulated experience.

Various theories have been used in the educational strategies of simulation, including: (a) *constructivist learning*, which uses active participation on the part of the students creating knowledge based on the experience in which they participated; (b) *brain-based learning*, which uses the ability to process the experience and alter learning from basic to more complex abilities; (c) *novice-to-expert,* which promotes growth based on experiences from novice (beginner) to expert (experienced); (d) *adult-learning*, which uses the concept that adult learners are mostly self-motivated, have preset goals, and learning centers on relevant content; (e) *experiential learning*, which uses the premise

that repetition and reflection improves skills and outcomes and creates permanent new knowledge based behaviors; and (f) *social-cognitive learning*, which uses the premise that behavior, personal factors, and environment interact cause learning and are dependent on each other (Rothgeb, 2008). While all these theories support use of HFS, no one theory has yet to be proven most effective for student learning in the use of HFS. It is up to the nursing program to identify a learning theory that matches their individual needs.

Hallmark (2015) stated that the barrier most often cited in literature to the use of simulation is the training and support of simulation faculty. The identification of standards and credentialing is a necessary step to positively impact simulation as a teaching strategy. Faculty members should review the curriculum as they add simulation to avoid overcrowding with strategies that are not well planned (Hallmark, 2015). Therefore, the need to educate faculty on the appropriate use of simulation as a teaching strategy is extremely important to a program's successful integration of HFS. (Hallmark, 2015).

The NCSBN conducted a study that involved 10 nursing programs from across the United States, of both baccalaureate and associate degree programs (Jeffries, Driefuerst, Kardong-Edgren, and Hayden, 2015). Jeffries et al. (2015) identified faculty training highlights from that study which compared acquisition of knowledge, competency in the clinical arena, and student perceptions of how well the simulations met their learning needs. Faculty were trained in the use of simulation, the design of scenarios, form of debriefing, and use of assessment evaluations, so that all faculty in the

10 programs were performing the same strategies and processes. The end result of the study showed that there were no significant differences in the three amounts of substituted simulations (control groups at 10% and interventional groups of 25% and 50%) relating to knowledge acquisition, clinical competence, or student perceptions about their learning needs. With this in mind, the authors concluded that faculty education/development are extremely important components to the adoption and successful use of simulation as an educational strategy (Jeffries et al., 2015).

The NLN, INACSL, and SSH have all addressed various aspects of simulation. The NLN has developed the Simulation Innovation Resource Center (SIRC), and it provides registered users with access to numerous simulation resources for educators (NLN, n.d.). INACSL (2013) developed *Standards of Best Practice,* which identifies simulation terminology, professional integrity of participants, participant objectives, facilitation, the debriefing process, and participant assessment and evaluation. SSH (2014) has developed credentialing standards for healthcare workers available on their website.

Jeffries et al. (2015) reported on the NCSBN study results and suggested "Simulation Education Concepts" based on this study (p. 20). They stressed the importance of educating faculty to use simulation and provision of staff development. A panel of experts at the 14th Annual INACSL Conference in 2015, when asked if faculty are prepared to substitute 50% of clinical hours with HFS, responded that they felt faculty were not prepared (Rutherford-Hemming, Lioce, Kardong-Edgren, Jeffries, & Sittner, 2016). The study conducted by the NCSBN found no significant differences between

learning of students who were educated clinically using 10% HFS, 25% HFS, or 50% HFS. They stressed "there is a need to produce evidence" of educator training in the use of simulation (p. 6). Based on consideration of the above information and the results of my study (the identified need of education about simulation, the need of a formal written plan, and a need for more debriefing), I chose a faculty development program for my project.

I made this choice to provide this program online to facilitate the busy schedules of nursing faculty. The asynchronous online program allows busy faculty to participate when the time is convenient for them. Findings from my study identified time as a as an important factor when discussing simulation and its use in nursing education. Faculty time is a precious commodity and in short supply. Providing this same program as faculty development offered over a 1-hour segment would not be possible. The information provided in my project would not require hands-on training, such as learning to program the simulator. This is usually provided through the vendor who comes in after the delivery of the simulator and spends several days training the faculty to use the specific simulator they have purchased.

I also considered a 2- or 3-day local seminar or conference as a format for the project. The cost of these types of conferences consist of travel, lodging, meals, and the conference itself, which can cost over $1,000 altogether. Most conferences are scheduled for either Wednesday through Friday or Thursday through Saturday. Our program faculty have clinicals on Thursdays and Fridays, which would preclude those faculty members from attending.

Summer is sometimes the best choice for conferences, but not all programs are out of school in the summer. Some faculty who do not normally work in the summer may find day-care issues in attending a conference in the summer, especially for 2 or 3 days. The cost of lodging and travel seems to go up in the summer as well due to family vacations. This could increase the costs associated with a conference in the summer. These were considerations involved in my determination to provide the project as an asynchronous online offering.

Review of the Literature

Numerous terms can be found in the literature related to keeping current on one's practice. These terms vary depending on the area in which nurses practice and include continuing education, competency, or life-long learning for those in the practice arena and faculty development, staff development or professional development for those nurses practicing in academia. A search of the literature was completed using Walden University, Graceland University, and Phoenix University, specifically using CINAHL, Medline, ERIC, Health Sciences, Nursing, and Educational databases as well as Google Scholar. Search terms consisted of *staff development, faculty development, professional development, competency* paired with the terms *high-fidelity simulation, human patient simulation, and simulation.* The search was narrowed to the years 2009 to present.

A faculty development program was chosen as my project as a result of the analysis of data from my study. Some of the comments identified in my study include (a) faculty lacked knowledge of simulation, (b) there were not enough faculty who were trained in simulation, (c) faculty did not understand what occurs in simulation, and (d)

faculty do not understand the steps needed to conduct a simulated experience. Other responses included lack of knowledge related to debriefing after a simulated experience, needing to develop their own scenarios due to the lack of appropriate scenarios, lack of financial resources to make it "real," and not having a written plan.

Several articles discussed comfort levels of faculty using HFS, the need for faculty development on this topic, especially after the NCSBN study concluded in 2013, and differing collaborative endeavors to provide faculty training. For the purposes of this paper, the term faculty development will be used. Article focus ranged from comfort levels to types and need of faculty development to components needed in the faculty development for the use of simulation. These were neither all nursing nor conducted in the United States. Simulation is used internationally, so some articles describe international use and faculty development.

Faculty Comfort Levels

Faculty comfort with simulation or its use is a commonly seen obstacle or barrier noted in the literature, that affects the integration of simulation into a course or program (Harder et al., 2013; Hollema, 2013; Taibi & Kardong-Edgren, 2014). A study of 20 faculty conducted by Harder et al. (2013) found that faculty engaging in the use of HFS "dreaded" the prospect of a simulated experience, felt inadequate in their ability to use HFS, and unqualified due to inexperience. Hollema (2015) studied comfort levels of 42 educators, using a pre and post-test method and found low rates of comfort before training. After training the participants reported an increased level of comfort, increased comfort in using HFS as clinical make-up, replacement for lecture, supplement to lecture,

and replacement for clinical hours. The participants felt it promoted higher expectations and collaboration in students, provided diversity in the learning environment, improved interactions amongst faculty and students, and provided active-learning opportunities. Even in today's educational facilities, some nursing faculty have not worked with simulators or seen demonstrations of their use. This lack of access and interactions with simulators can have significant impact on the comfort levels of faculty considering the use of HFS.

Faculty who are new to simulation or new to academia may also have low comfort levels when being introduced to the use of simulation or HFS. Taibi and Kardong-Edgren (2014) surveyed faculty members of all health care professions and discovered that in five states in the northwest United States, less than a fourth of the participants used simulation in their programs. The highest educational need identified by these participants was training in this teaching strategy. This differs greatly from a study by Davis, Kimble, and Gunby (2014) who found nine out of 139 undergraduate faculty did not use HFS in their programs. Faculty using HFS generally had positive attitudes about the use of simulation as a teaching strategy, but cited knowledge of technical aspects and time constraints as challenges. The authors felt that possible reasons for their concerns could be related to lack of knowledge and skills about specific technologies, not having adequate laboratory staff, or having manikins in need of repair. Fear of technology has been identified as a reason that faculty do not use simulators or that they demonstrate a reluctance to implement such technologies (Al-Ghareeb & Cooper, 2016; Anderson et al., 2012). Training in the use of HFS is therefore a

significant factor to its use in nursing curricula and is a determinant in the needs of faculty education. Specific standards are needed to guide development of HFS programs and the experiences designed for student participation.

Simulation Standards

Several entities have identified the need for standards that guide practice in the use of simulation. INACSL directors (2013) formulated *Standards of Best Practice* which identified areas related to the effective use of simulation. These include facilitation of simulated experiences, the participant objectives for the simulation, professional conduct of participants, debriefing of simulated experiences, as well as formative and summative evaluation of participants. One particular group of authors suggested implementing all of the standards in each simulated experience and to write policies and develop orientation practices to support this (Rutherford-Hemming et al., 2015). The NLN (2015b) identified the need to teach faculty the fundamental knowledge of simulation pedagogy and training in debriefing of learners after they have experienced a simulated encounter. This required faculty to use best practice related to "design, implementation and evaluation of simulation-based experiences" (p. 5). Internationally, simulation is also used and needs for quality indicators were identified.

A Delphi study was conducted in Australia, which resulted in development of quality indicator statements (Arthur et al., 2013). These quality statements addressed pedagogy: (a) making sure simulated experiences align with course objectives and goals for the curriculum; (b) fully integrate experiences through the program; (c) level the experiences based on student skills and knowledge; (d) the experiences should be used in

all clinical courses; and (e) design of all simulated experiences take into account student preparation, group size, manikin fidelity, interdisciplinary components, observers, equipment, and debriefing method. The use of standards in the development of policies, procedures, orientation, and design of each simulated experience is essential to a successful integration of simulation into a nursing curriculum. Facilitation of simulated experiences is an essential element for the student experience; therefore determination should be made on how to incorporate these standards.

Standard V: Facilitator identified criteria for facilitators of simulated experiences (INACSL, 2013). These criteria included knowledge of simulation pedagogy, simulation structure including fidelity, design of scenarios, and student outcomes. The facilitator should also provide appropriate cuing to assist participants and steer them toward accomplishment of the learner objectives and a secure, safe environment in which the student may practice. This requires knowledge, by the facilitator, of the elements of simulation. Rutherford-Hemming et al. (2015) encouraged facilitators to avoid the urge to teach during simulation to keep the focus on the learner, not the teacher. It is imperative the facilitator guide, encourage, and support the learner in order for them to accomplish objectives of the experience, to use critical thinking, and acquire knowledge to apply to the clinical setting. When addressing simulation as a successful teaching strategy, there appear to be necessary educator or facilitator competencies as well (Topping et al., 2015). This team of authors reviewed nine articles that met their inclusion criteria of descriptors including: (a) the educator role in simulation, (b) participant outcomes noted as evolving from training, or (c) strategies in the use of

simulation as a teaching strategy. Themes identified in this review included “knowledge, behavior, skills, and comportment” (Topping et al., 2015, p. 1110). Knowledge was further clarified as the use of subject matter and learning theories, ability to adjust the fidelity of the simulator to the experience desired, and the knowledge of current practice. Behavior and skills were grouped together to include knowing how to program the simulator, ability to guide versus teach during a simulated experience, and knowledge and skills in handling dynamics of groups. Comportment involved the facilitators attitude toward simulation and during the debrief period (Topping et al., 2015). These traits are echoed by Arthur et al (2013) as knowledge to design scenarios, facilitate debriefings, program manikins, and enable students to relate didactic content to practice. Rutherford-Hemming et al. identified a facilitator’s ability to clarify objectives, convey expected student outcomes, provide safety in the environment, provide feedback that is conducive to meeting objectives and learning, and to model a professional image. Faculty involved in education need to portray a true desire to help students become successful in the acquisition and application of knowledge for future practice. This identifies a need for faculty development opportunities for facilitators and educators using this teaching strategy

Faculty Development

Faculty training in the use of simulators has been shown to be essential to the success and integration of a simulation program in the nursing curricula. A systematic review of 25 articles concerning faculty development from the years 2004 through 2013, identified incentives to encourage faculty to undertake HFS, including: (a) buy-in; (b)

release time from workload to accommodate development of HFS; (c) attendance at HFS faculty development seminars, conferences, and workshops; (d) having a faculty mentor familiar with HFS; (e) necessary equipment to effect “realism;” (f) staff support; g) faculty compensation; and h) support from administration (Nehring et al., 2013). Another review identified seven incentives three of which match the above study (support of administration, training of faculty and financial incentives) as well as the following: (a) characteristics of instructors, (b) teaching strategies, (c) dedicated simulation coordinator, and (d) technical support (Al-Ghareeb & Cooper, 2016). Knowing how faculty members wish to learn new skills can be beneficial to the design of faculty development programs.

Faculty development should be designed to accommodate the learner in the acquisition of skills necessary to perform the designed task. A survey conducted with participants attending the 2009 Annual International Nursing Simulation/Learning Resource Centers Conference found the learning style identified as most effective for the acquisition of simulation skills was hands-on practice with immediate feedback from skilled simulation experts (Anderson et al., 2012). This indicates a need for both skilled and novice faculty to participate in simulated experiences so that skilled faculty can provide feedback to the novice members. Acquisition of knowledge and training must be provided in order to allow faculty to undertake the addition of simulated experiences to the nursing curricula. Faculty development plans need to be formalized determining what format and components the program will need to provide the necessary elements to help faculty use the strategy.

Adequate planning includes policies, procedures, fiscal resources, space and equipment. Fiscal resources must be allocated in order to train staff, maintain manikins in working order, design and or build a simulation laboratory, and purchase necessary equipment all essential elements to the successful undertaking of a simulation lab. Barriers include (a) lack of time, (b) lack of trained staff, (c) lack of equipment and financial resources, (d) lack of substantial space for simulation, (e) insufficient number of manikins as well as nonfunctioning manikins, (f) workload issues, and (g) fear of technology have been identified to faculty use of HFS (Adamson, 2010; Al-Ghareeb & Cooper, 2016; Anderson et al., 2012; Jansen et al., 2010; Nehring et al. 2013). Some of these barriers exemplify the need to financially plan for such an undertaking and demonstrate this essential step to determine the success or failure of a simulation program. Since nursing faculty have identified barriers to the use of simulation and we know that others also use simulation outside of nursing, it becomes important to ascertain what is known about the barriers they faced and how they overcame those barriers.

Medical programs use high-fidelity simulation and have identified barriers similar to those found in the nursing literature including: time factors, participation by novice educators, and willingness of students to actively engage in the simulated experience (Dieckmann, Friis, Lippert & Ostergaard, 2012). These authors also identified success factors such as faculty motivation and willingness to “make believe” or adding realism to the experiences. Faculty planning for these experiences includes identifying the needs of each actual simulated experience for the students, so they get the most out of the

experience and are able to apply that knowledge in their practice setting. There are specific steps to the design of simulated experiences.

All simulated experiences begin with a scenario; which educators can write themselves or procure from various sources either free or purchased. It is suggested that scenarios be written and rehearsed with the faculty members and the simulation expert (Rutherford-Hemming et al., 2015). This practice implements and reinforces the standards set forth by INASCL for the use of simulation. The rehearsal provides feedback to faculty members, allows adjustments for any cueing that may be necessary for student success, and allows faculty members to become familiar with the simulated experience. Quality indicator statements included preparation and training of staff in the use of simulation technology, scenario design consistent with learner and course objectives, and that staff have sufficient clinical expertise and teaching skills to affect student learning (Arthur et al., 2013). A significant portion of the written scenario includes adding fidelity, which should be cost effective, and consistent to learner objectives using appropriate equipment which includes electronic patient information and health records to affect reality. Lastly, the quality statements addressed debriefing in relation to having a method that keys in on student self-evaluation of their performance and providing feedback, and discussions of clinical reasoning, teamwork, leadership, and communication (Arthur et al., 2013). Planning and training are both identified in the literature as necessary components in the adoption and integration of simulation into curricula, so the next determination is how best to offer the training to educators.

Types of faculty development. Nursing faculty development programs provided for the purpose of teaching other nurse educators about simulation have been developed over the last 10 to 15 years. Faculty development, like faculty themselves, come in many forms to provide the necessary elements for a specific population of educators, to accommodate specific geographic locations, or to accommodate busy schedules and time constraints. They may take the form of consortiums, collaborative ventures, toolkits, train-the-trainer programs, online modules, webcasts, podcasts, or courses. Various forms will be discussed in this section.

Collaborative and consortium endeavors are the work of more than 1 person or groups of people to accomplish a shared goal. The literature provides examples of a few of these organized groups and discusses the types of faculty development offered by them in relation to HFS. One such collaborative is the Bay Area Simulation Collaborative whose goal was to train large numbers of faculty and practice educators in the use of simulation and to develop scenarios for their use (Waxman & Telles, 2009). The collaborative was made up of academia and hospital educators from 100 facilities with 600 educators, learning the use of HFS. Based on the novice to expert model, they used several designs to accomplish their goals, which included: (a) two full day face-to-face classes, (b) a full immersion experience with simulators and experts, and (c) a 72 hour apprenticeship. At the time the article was written this collaborative had educated more than 400 clinical and nursing educators. A consortium that spanned four states and involved 33 academic educators and eight hospital educators was described by Halstead et al. (2011). This consortium used the "train-the-trainer" design returning trained faculty

to train their colleagues and function as a simulation resource for training faculty. They began with a weeklong full immersion workshop, followed by monthly meetings. All parties of the consortium made decisions and had access to all 15 scenarios developed as well as the 38 that were at the time being developed. Attendees voiced a higher sense of confidence after the immersion workshop and this teaching strategy has been adopted over all levels of their curriculum.

A Wisconsin collaborative, the Wisconsin Technology Enhanced Collaborative Nursing Education (WI-TECNE) was a project between nursing programs from five University of Wisconsin and five Wisconsin Technical Colleges to address the use of technology in teaching for nursing faculty (Jansen et al., 2010). WI-TECNE used a face-to-face workshop (a day and a half), brown bag lunch video conferences (6) and online discussions over a 2-year period. Originally faculty identified six barriers to the use of HFS and at end of Year 2; the following were still considered barriers time, lack of equipment and space, and large class sizes. Faculty who participated in this collaborative felt this was a successful endeavor despite the fact there were still some barriers.

A Texas collaborative consisted of area nursing schools joined by four area hospitals to establish the Nursing Regional Interdisciplinary Simulation Centers (Lujan et al., 2011). Each lab was located in one completely furnished room of each of the hospitals and simulation equipment was purchased with grant money from the nursing programs. All members of this project had equal access to the labs. Participant noted deterrents from this project included: (a) the need to schedule a tech and the room through the hospital, (b) the large number of requests to use the center from outside

entities, (c) lack of follow-through in filling out forms necessary to write the grant report, and (d) the loss of time and faculty enthusiasm due to late appointment of grant monies.

Another consortium using the "train-the-trainer" model in the Texas Gulf Coast region trained faculty in HFS (Coleman et al., 2011). Faculty members felt the consortium and the training had made it possible to implement HFS strategies in their programs and students noted that this training has helped to regulate teaching effectiveness in the lab. Although not a consortium, Lane and Mitchell (2013) described a "train-the-trainer" initiative that identified a simulation champion and set clear guidelines for participation in a three-step plan to prepare nurse educators in the use of simulation. The plan required completion of coursework available on the SIRC website, hands-on training in debriefing and evaluating simulation, and finally the return to their home facility to train others.

Faculty development can also occur as an online offering in the form of modules, webcasts, podcasts, and courses. Benefits seen are that these online forms allow the learner to activate them at their own convenience and to forego the costs of travel and accommodations such as hotel, meals, and transportation. The NLN (n.d.) developed the SIRC website which became active in 2008 and provides courses, templates, videos, presentations, and other resources for educators to use in implementing simulation. The website does require registration, but for most resources it is free upon registration. Courses can be taken at a cost.

The Louisiana State legislature in 2009 mandated formation of a council (Simulation Medical Training and Education Council of Louisiana) for the purpose of

determining resources, expertise and use of simulation in education (Lemoine, Chauvin, Broussard, & Oberleitner, 2015). This included all health care professionals and is expected to result in three phases, the first phase already completed. The council developed 90-minute modules for training of educators in all aspects of healthcare education who currently use or expect to use simulation. Phase I was noted to be effective having met their goals by developing a foundational basis for the future. They also expect to use a train-the-trainer approach for those who have completed the original module to train more faculty in their home institutions/agencies.

Toolkits for use by faculty have been developed in some programs which include resources such as templates to be filled in by the faculty designing the experience, and presentations used as resources for continuing education purposes or orientation. These resources are frequently kept on the learner management software for easy access. Webster (2009) described a "Faculty Toolkit" which was constructed by experts from the author's school. The toolkit helped the faculty of the school fully integrate simulation into their curriculum. Goals of the project were: (a) increase ease for faculty developing scenarios, (b) provide reference tools through templates (Microsoft Word), presentations (Microsoft PowerPoint) and other current resources, and (c) provide material for future faculty orientation and continuing education. Webster also described a CD version for use by faculty which contained all the above documents. (Webster, 2009).

The collaborative known as Interprofessional Collaboration for Integrative Technologies in Education has also developed an online toolkit for educators' use. The courses and resources are currently free, but a registration is required to use the site

(Taibi & Kardong-Edgren, 2014). A faculty resource described by Lane and Mitchell (2013) called "Sim-in-a-box" consists of all the equipment necessary to run a simulation, is labeled with the name of the simulation and ready to use. Repositories can be considered as faculty toolkits and consist of specific resources for members of collaborative and consortium groups. These resources are usually not open to the public unless the groups were provided with a grant which stipulates free access until the grant expires. I have discussed several options for providing faculty development. Not all types will be optimal for every program, but it is obvious that they must be planned, timed and developed with the population and setting in mind. The next determination should be to identify the components most crucial to the development of simulated experiences and thereby most crucial to the faculty who design them.

Elements of faculty development. Once faculty are trained in the pedagogy of simulation, specific elements must be developed in order to integrate simulation into the curriculum and program. Faculty need to plan for development of a program which includes determining necessary equipment and simulators, procuring funds, writing scenarios, evaluating the simulations and the program, and making changes as needed based on the evaluations. Since the study by the NCSBN (Hayden et al., 2014) there is much discussion of the steps taken to make sure that all sites in this 10 facility study were conducted under the same conditions. One of the first discussions related to a framework for the simulations (Jeffries et al., 2015). The NCSBN chose the Nursing Education Simulation Framework (Jeffries, 2007) concentrating on the five components of the model "facilitator, participant, educational practices that need to be incorporated into the

simulation, simulation design characteristics, and expected participant outcomes (Jeffries et al., 2015, p.18). The simulation design contained type of fidelity needed, a problem for students to solve, objectives for the learners to meet, how students would be cued, and items to discuss in debriefing. Faculty development began 12 months prior to the beginning of the study and covered topics such as (a) conducting simulations, (b) debriefing participants, and (c) use of tools for evaluation. They also suggested all programs attempt to do something similar in their own programs. Each school had a designated simulation team who worked with all simulated experiences, conducting and debriefing them. Clinical faculty scored their particular students during the simulated experiences.

Writing simulated experiences is done best using a template such as one offered by Bambini (2016) which included: planned simulation scenario that begin with best practice principles in simulation, clinical practice and education; a step-by-step process beginning with outcomes and objectives; the domain of learning you are trying to accomplish; the knowledge level of the learner (beginner, intermediate, advanced) to determine the expected student objectives; the overall outcome to be accomplished; student behaviors, actions, and objectives you expect to see; matching the overall outcome of the simulation to evidence-based policies and procedures, as well as clinical practice. The second step is to determine on paper, the flow of the simulation from the beginning (the set-up of the situation), to the middle section (where things begin to change to include basic information, diagnostic results, patient vital signs, symptoms, complaints/suggestions, etc.). This is where things begin to change and should become

evident to the learner so interventions can be taken. Cues may be provided by the patient or instructor to guide the learner in the correct direction to problem-solve on their own. The ending section should include: (a) what should occur if all interventions are done as planned, (b) what might occur if some of the interventions are accomplished, and (c) what will happen if none of the interventions are accomplished. All details making this as realistic as possible should now be entered into the map including any family encounters involved being sure to script those roles. Vital signs, diagnostic work-up ordered or resulted, physician orders, medication sheets, etc. need to be added to make the scenario realistic.

Debriefing is the final piece to a full simulated scenario. INACSL's (2013) *Standards of Best Practice.* Standard VI addresses the debriefing process defined as facilitator led activities, after simulated experiences, that allow the students to reflectively think back on their performance. The end result of this practice provides assimilation of content and skills learned in the simulated experience from which they can draw in future experiences. Audio and video recordings of simulations can be done to allow faculty to see what is actually transpiring during the simulation. It provides visualization of areas needing to be reinforced by faculty (e.g., hand washing, introducing themselves to the patient, or obtaining two identifiers before administering medications or treatments). Recordings can also provide opportunities for clarification (students and faculty) or to show that something thought omitted actually did occur.

Standards of Best Practice: The Debriefing Process (INACSL, 2013) include criteria such as: (a) the person facilitating should be competent in the debrief process; (b)

debriefing should be supported by confidentiality, trust, open communication, reflection and analysis of self; (c) the facilitator should have witnessed the simulation exercise; (d) debriefing framework should be structured; and (e) should be based on the outcomes and objectives of the participants. Phases of debriefing consisting of (a) reaction, (b) analysis, and (c) summary have been identified in the literature (Arafeh, Hansen, & Nichols, 2010). Debriefing should take place after the simulation and in a room other than the simulation lab. Every participant will come to the simulation experience with their own "reference point" (experiences, knowledge, and thought processes) that will determine their response or reaction to the simulation. The timeframe for debriefing should be at least as long as the simulations (15–20 minutes depending on if a video is watched) and some say 2–3 times the length of the simulation (Arafeh et al., 2010). A literature review related to best methods for learning through debriefing used inclusion criteria: focused on debriefing, based on nursing students, published within the last ten years, and written in English, resulted in two articles (Dufrene & Young, 2014). The search was extended to include residents and medical students yielding 13 articles total. Analysis of these articles revealed increased knowledge with debriefing, but did not show any significant differences related to debriefing styles used.

The need for faculty development is seen in the design of the National Simulation Study (Hayden et al., 2014; Jeffries et al., 2015). Simulation education concepts necessary to the development of a simulation program include: simulation scenario development and implementation, simulation training and skills development, faculty selection for conducting simulated programs, and integration of simulation into a nursing

program. A research study in Thailand focused on questions about the effects of faculty development on simulation pedagogy and on the faculty's attitudes about using simulation (Roh, Kim, &Tangkawanich, 2016). A 2-day simulation faculty development program was used to collect data and questions included: characteristics most effective in simulation; assembly of equipment, simulator and lab design; scenario design to include fidelity, equipment, and assessments; programming of the simulator; conduction of simulation; and debriefing. Sixteen attendees were given a pre and post-course learning and attitudes survey and final analysis showed statistical improvement in all nine areas of the survey. This demonstrated the effectiveness of simulation faculty development programs in the United States and abroad in all health care areas.

Other forms of online faculty development. Educators, whether nursing or not, have numerous time constraints attached to their roles as educators. National, international, and regional conferences can be relatively expensive. Online offerings specific to the educators' needs are useful alternatives to alleviate some of these costs. Institutions no longer provide the needed funds for continuing education due to budget costs.

Social media is being used in education with mixed results. A medical faculty development program ending in a 3-year certificate for pediatric faculty was offered though a closed group format on Facebook (Klein, Niebuhr & D'Alessandro, 2013). The 17 participants were polled through SurveyMonkey to answer questions about curriculum, evaluation, knowledge assessments, and self-reported behaviors. Prior to beginning the modules, only one participant saw professional value in social media and

60% of participants saw professional value in social media six months after the program ended. Comparisons of online staff development to conferences, seminars, or other forms of face-to-face programs for training of nurses or physicians found that online formats were comparable to face-to-face training; online faculty development program were usually more effective than no development; and several things contributed to successful endeavors (Cook & Seinart, 2013). These factors included: the course met the need of the learner; it provided time to complete the objectives of the course; it had the support of the institution; and learners were more successful with discussion formats and social interactions. Faculty members in higher education were given a 5-week online course (BlendKit) designed to teach the skills to facilitate and design hybrid/blended courses (Moskal, Thompson, & Futch, 2015). The course provided reading topics pertinent to the course design; focus questions; projects the participants could do themselves; and webinars with experts on a weekly basis. At the end of the third offering, satisfaction scores were analyzed showing highest satisfaction factors included: "course content, resources, materials, course management, organization, structure issues" (p. 109). These studies show that if the content is what the learner needs, the satisfaction regardless of format is the same and possibly better in relation to time constraints for the online format.

Fishman et al., (2013) compared a course consisting of two face-to-face, 12-hour orientation days followed by an online "workshop" completed at their own pace to a 6-day, 48-hour, face-to-face workshop to determine if any differences in: learning for the participants; classroom practices of the participants; or student learning outcomes in the

two groups of participants. Both groups of teachers had access to the same materials. Teachers (one group of 24 the other group 25) were given a pre- and post-test to determine science knowledge and their beliefs on teaching science. Students (a face-to-face group of 522 and an online group of 610) were given a pre- and posttest to determine science content knowledge. Researchers found no significant differences in the results for the teachers or the students in this study (Fishman et al., 2013).

Cho and Rathbun (2013) felt there were not enough face-to-face, interactive professional development programs in higher education, so they developed an online program. The program was based on problem-based learning principles and faculty members produced exemplars that they could then use in their own classroom. The modules were asynchronous, allowing faculty to participate when most convenient yet meet deadlines of the course for each activity. This staff development program was deemed successful and participants were satisfied with this form of learning experience as results identified: an increase in active participation; exemplars that could be used in their specific courses; and experience with online teaching and learning principles that allowed them to better understand online student experiences. The one limitation found was that faculty workload (heavy workload equates to lower faculty enrollment) has a direct bearing on the enrollment in online staff development programs.

Motivational barriers and enablers were identified with online faculty development programs (Miller, 2015). Surveys of 25 faculty in rural eastern Kentucky identified factors that motivated faculty to take an online staff development offering or discouraged faculty from taking an online faculty development offering. Enabling factors

included: flexibility of online programs, available funding, and access to these online programs. Discouraging factors included: feelings of being isolated in online formats, lack of time, and feelings that questions were not answered. Interconnectedness is an important aspect of online offerings and must be considered as a course component to eliminate the feeling of being isolated in the asynchronous environment of a faculty development program. I have discussed several forms of faculty development as well as the conclusion for each of the studies. There are many formats for faculty development and the next section will discuss the rationales used to determine the format of my projected faculty development plan.

Implementation of Project

Analysis of the data provided in my study identified structure and process factors relevant to the integration of simulation into a baccalaureate curriculum. More explicitly, faculty knowledge, faculty time, number of trained faculty, and faculty development were barriers identified in most of the participant responses. Faculty comfort in the use of HFS has been a barrier to its implementation and faculty development can aid in alleviating this barrier and has been shown to be a major factor of success in the NCSBN study (Hollema, 2015).

The literature supports faculty development in the use of simulation as a teaching strategy (INACSL, 2013; NLN,2015; Nehring et al., 2013) and various other authors have discussed types of faculty development used in the delivery of these faculty educational offerings (Coleman et al., 2011; Halstead et al., 2011; Jansen et al., 2010; Lane & Mitchell, 2013; Lujan et al.,2011; Waxman & Telles, 2009). The faculty

development program I developed based on the data from my study explains simulation including the writing of a formal plan for simulation, gives learners firsthand experience writing a scenario, explains the extras needed to make simulation more real for the learner, explains debriefing, and provides numerous resources for all these components.

Potential Resources and Existing Supports

The support of various faculty has been evident in the responses given in the questionnaire used in my study. I believe faculty would be eager for a development project locally that can provide education to alleviate several of the barriers identified through the results of my study. Simulation is too expensive an endeavor to allow faculty to continue to have concerns about its use and consequently not use those resources to the best possible extent. I have been asked to present my study results at our faculty meeting and with our local simulation group. The local group has been very interested in hearing my results, as many of those program faculty members took part in the study.

Potential resources needed for success of this program would be a website or learning management system on which to provide my development program. Since my program can be attended from the confines of learners' own homes, there will not be any refreshments or facility space required. This program could potentially be offered through the distance learning center of a metropolitan college as well. I discuss my role as facilitator for this program under the heading of "Roles and Responsibilities of Student and Others."

Potential Barriers

Barriers to the success of this program include funding for a learning management system to provide access to my program. The program is being offered in a 6-week timeframe due to the time constraints of most faculty teaching full-time in an academic setting, so time may be a potential barrier as well. The most obvious barrier would be a lack of interest in the program. Another barrier might include difficulty in marketing the program. Flyers can be sent to each of the nursing programs by contacting the local dean's community in our metropolitan area (Collegiate Nurse Educators). Marketing in the past was through a metropolitan nursing newsletter which has since closed down. Most faculty do not teach in the summer, and the local simulation group meeting is not scheduled until October. That group meets only three times over the year. Meetings are usually scheduled once in the fall, once in the spring, with a half-day conference in May. The local simulation group would be my first choice for the distribution of marketing information about the simulation faculty development program. The agenda for the first fall meeting is distributed early to all area nursing programs through the deans and could include a brief description of my study and be placed on the agenda for the first meeting. It would also include information pertaining to the three modules I will be providing for education about simulation. A certificate could be awarded through our school of nursing to faculty members who complete all three modules, to document training in simulation.

Proposal for Implementation and Timetable

Implementation of the program will come after my doctoral program completion. Faculty members will be out of school for the remainder of the summer, with most

classes beginning the first week of September 2017. Flyers will need to be developed for marketing of the program. My plan is to offer this program in November 2017. The distribution of the program flyer would coincide with the first fall meeting of our local simulation group in early October of 2017. I will have disseminated the results of my study and procured a platform to begin offering the three modules over a 6-week timeframe. I will also contact our local community college about offering this program to educators as a continuing education unit for nursing faculty members who work with or would like to work with simulators.

Roles and Responsibilities of Student and Others

My responsibility as the facilitator of this program will be to make sure I maintain a workable schedule to accommodate this offering. I will be managing a full-time teaching load at that time and will need to be mindful of the appropriate number of learners, approximately six, for the first offering. My load for spring is much more flexible, so at that point more participants could be added. The facilitator must be able to answer questions that may arise and provide guidance to the participants. I need to have a good base of knowledge related to the contents being provided for the participants. Evaluation results will guide future program changes relating to feedback from those who attend the first program and all future programs. Each time the program is offered evaluations will be collected.

Participants will be submitting work to the facilitator, so the participants must also be engaged in the resources and design of the modules and be aware of timelines. The participants will need to schedule time to work on these modules, which is why I

designed them as 2-week segments. Most participants will probably be faculty members who also teach full-time, so their time may be in short supply as well. Time constraints may become evident after the first program evaluation.

Project Evaluation

The goals of the program are to provide guidance and training related to understanding simulation, writing simulated experience scenarios and debriefing learners after a simulation. For this reason the evaluation will be outcome-based and written using a Likert scale of 1strongly disagree to 4 strongly agree. The last question will be open-ended to allow the participants to discuss challenges and suggestions for future program offerings. It will address the learner objectives from each of the modules for the program. Each participant will have an opportunity to evaluate the program using this survey. The survey will be provided to the participants at the close of the third module of the program via an e-mailed link to SurveyMonkey. Program goals of each module include:

Module 1 Program Goal: Increase the knowledge of nurse educators concerning simulation as a teaching strategy.

Learning outcomes: After completion of Module 1 the learner will be able to:

1. Identify resources in the development of a simulation lab plan.
2. Determine necessary equipment for constructing a simulation lab.
3. Evaluate approximate costs for construction of a simulation lab.
4. Construct the beginning financial plan for the development of a simulation lab.

Module 2 Program Goal: Enhance knowledge and skill in writing scenarios for high-fidelity simulated experiences.

Learning outcomes: After completion of Module 2 the learner will be able to:

1. Identify necessary components for development of a high-fidelity simulated experience.
2. Compare various available online templates for use in high-fidelity simulation scenario writing.
3. Determine means and equipment necessary to "suspend reality" in simulated experiences and scenarios.
4. Develop a scenario for a simulation experience for students.

Module 3 Program Goal: Enhance the knowledge and skill for use of debriefing techniques.

Learner Objectives: After completion of Module 3 the learner will be able to:

1. Define the process of debriefing.
2. Compare research findings related to the process of debriefing and the different ways of conducting debriefing exercises.
3. Describe what makes debriefing "the most important" part of the simulation experience.
4. Develop a debriefing outline for a simulated scenario.

The program was developed to allow the participant to work with the information versus being simply provided with information. Providing a form of hands-on interaction with the material and the participant would be more beneficial and similar to a seminar or

conference where activities are used. Information obtained from these surveys will be used to make necessary changes for the next program offered. Each time the program is offered, an evaluation will be collected, information analyzed, and changes made based on participant feedback.

Key stakeholders involved in this project include the participants and nursing programs of the metropolitan area who responded to my questionnaire adding to the current level of knowledge relating to the integration of a HFS program into the curriculum. The provider/platform hosting these modules is also a stakeholder with ties to the success or failure of the endeavor. The metropolitan area simulation group whose members may have contributed information and others in the group who will learn from the results presented at their fall meeting. Future nurse educators within our metropolitan area who will be able to complete the 3 modules and obtain a certificate of completion to identify that they have had training in simulation. Current and future students who will be impacted by the knowledge acquired by their educators and by the simulated experiences they will interact with.

Implications Including Social Change

This project will be provided to enhance knowledge of nurse educators, seasoned as well as those new to academia, on the benefits of simulation, how to adopt simulation beginning with a formal plan, how to write scenarios and how to effect acquisition of knowledge in students using techniques of debriefing. Each module provides activities that will facilitate the acquisition of skills. Students are requested to submit their work

for faculty feedback. Each student is thereby allowed to practice the skills learned in each module.

Local Community

Locally there are numerous nursing programs in our metropolitan area who have purchased simulators (at least seven baccalaureate programs and possibly three associate degree programs). The NCSBN, NLN, and INACSL as well as the SSH address the need for guidelines to use simulation as a teaching strategy. The development of an online resource for these educators will impact their teaching effectiveness for their students. Administration of all educational programs are responsible for budgets. The benefit of this program for administrators will be that educators will more effectively use the resources currently provided. Simulation will be enhanced by the knowledge these educators will acquire through the online modules. Conferences are not cheap; therefore, the online format is much more economical in today's market. Students will benefit (a) from the faculty's acquisition of simulation skills and (b) the increased use of simulation for the transfer of knowledge from the classroom to the bedside. Clinical placement agencies want graduates who can quickly adapt to the new role of staff nurse. Clinical placement sites for nursing students are in short supply, so using simulation and having educators skilled in this teaching strategy will accommodate both situations.

Far-Reaching

Many of the nursing programs have procured financial resources, which have been donated or they have written grants through HRSA and other sources to purchase their simulators. Sometimes those resources have also funded a full laboratory and a

designated faculty for that lab. Regardless of where the financial resources come from, the supplies purchased should be used to their full potential. This faculty development program will help increase the number of educators knowledgeable in the use of simulation. Since the NCSBN study concluded in 2013, we now know that at least 50% of clinical can be substituted with simulation without affecting patient safety or skills of nursing graduates.

Conclusion

Through this section, I have provided a detailed summary of literature related to faculty development in the use of high-fidelity simulation. I have suggested a detailed plan to facilitate the acquisition of knowledge necessary to undertake simulation in a nursing curriculum. Future plans for this program involve being able to offer continuing education units for faculty taking this program. This program can also become part of a faculty conference where hands-on participation is a segment provided to the audience with live immediate feedback.

The next chapter describes my study, my results, and the project developed based on my results. It will describe the identified strengths of my project as they relate to my study results. Alternative approaches and possible limitations will also be explored in detail. I will discuss scholarship developed through the evolution of this study and the faculty development program developed. Reflections are essential for success of projects. For this reason, I will also discuss my role as a scholar, practitioner, and project developer. I will end with a discussion of the importance of my work, its effect on social change and the impact it may have on future research.

Section 4: Reflections and Conclusions

Introduction

The purpose of this study was to explore perceptions of nursing faculty at Midwestern metropolitan baccalaureate nursing programs about best practice elements for successful integration of HFS into an undergraduate nursing curriculum. Analysis of qualitative data from nursing faculty's responses to an e-mail questionnaire provided information of a need to educate faculty about various aspects of the teaching strategy of high-fidelity simulation. In response, I proposed the development of a faculty development program with the goals to: (a) increase the knowledge of nurse educators concerning simulation as a teaching strategy, (b) enhance knowledge and skill in writing scenarios for high-fidelity simulated experiences, and (c) enhance the knowledge and skill for use of debriefing techniques.

The results of my study provided numerous themes relating to factors of Donabedian's (2003) structure-process-outcome model of quality. Emergent themes related to structure factors were not having adequate numbers of trained faculty or faculty development and lack of information specialist, space, and financial resources. Themes that I identified from the data relating to process factors included support, curriculum, and governance. Administrative and faculty support is essential for a successful simulation program. Lack of support, even faculty-to-faculty support, can be due to not having experience with simulation or not understanding how simulation can be used as a teaching strategy. Debriefing was another theme that was identified in my analysis of the study data. Lack of debriefing could be identified as a lack of student support, which in

turn would affect outcomes of the program and students. These are the reasons I concentrated on faculty development, in order to alleviate some of the concerns relating to faculty knowledge and support.

In this section, I will discuss the project strengths as well as the limitations. I will present alternative solutions, and provide an analysis of what was learned. This will include learning through the project and learning about myself as an educator, project developer, and as a scholar.

Project Strengths

I developed the project to address the issues uncovered through my study involving faculty who had integrated simulation into their baccalaureate nursing programs. My study posed the following four research questions:

1. How do faculty describe successful integration of HFS into a baccalaureate curriculum?
2. What structure factors are related to successful implementation of HFS into a baccalaureate curriculum?
3. What process factors are related to successful implementation of HFS into a baccalaureate curriculum?
4. What outcome factors are related to successful implementation of HFS into a baccalaureate curriculum?

Themes were identified for each of the questions posed.

Most themes were related to faculty knowledge of simulation and experience in simulation as well as knowledge of debriefing techniques and experience with this

portion of the simulation process, so I chose to address this lack of knowledge and experience with faculty development. The strength of the first module related to identification of a simulation champion who can push for the adoption of simulation and teach other faulty about simulation. The first module provides the learner with an opportunity to see and then to write specific portions of a formal business plan.

The second module reflected the need identified in my study of conducting a simulation. Data supported the need for faculty to understand and participate in simulated experiences. The strength of the second module lies in scenario development, either writing scenarios, using scenarios available online (giving credit to the actual authors), or purchasing scenarios from publishers. Another strength of Module 2 includes knowledge about where and how to identify methods of making scenarios and simulations "real" to actively engage the students interacting with the simulators. Realism is accomplished by identifying appropriate props and making the patient appear the way they would present in real life (i.e., wounds, looking pale or jaundiced, or bleeding).

Another theme identified from my data was debriefing, so the third module dealt with debriefing research and techniques. Strengths as they relate to successfully integrating simulation included learning how to debrief the students after the simulated experience for student learning. In my project, teachers are provided with a video of several actual sessions as students are debriefed. Student learning occurs during the debriefing of the experience when students can reflect on their thinking and actions and the repercussions of both (INACSL, 2013). Debriefing allows the entire group to reflect

individually and as a group on the experiences they have shared in the simulated experience.

Information from my study was triangulated with INACSL's *Standards of Best Practice* (2013), the national simulation study conducted by the NCSBN (Hayden et al., 2013), the NLN *Vision Series* (2015) on teaching with simulation and debriefing, as well as my journal notes from each of the returned questionnaires. Because my study involved faculty from five area nursing programs, who had already integrated simulation, it provided expert perspectives using the faculty's own first-hand experiences. This guided the development of the three simulation modules intended to provide the faculty development needed to integrate simulation into baccalaureate nursing curricula.

Recommendations for Remediation of Limitations and Alternative Approaches

Educator interest or "buy-in" may be one limitation to the effectiveness of this program. It is well known through literature (e.g., Adamson, 2010; Akhtar-Danesh et al., 2009; Aldridge, 2016; Al-Ghareeb et al., 2016; Anderson et al., 2012; Davis, 2012; Davis et al., 2014; Dieckmann et al., 2012; Gore et al., 2012; Hanberg, 2008; Howard et al., 2011; Jansen et al., 2009; Jeffries et al., 2015; Jones & Hegge, 2008; Katz et al., 2010; King et al., 2008; Miller & Bull, 2013; Miller, 2015; Rothgeb, 2008; Schlairet, 2011; Taplay et al., 2015; Thompson, 2011) and through analysis of my study data that time is a huge factor related to simulation for all educators. It takes an inordinate amount of faculty time to develop scenarios for simulated experiences, to conduct them, to debrief the students, and to evaluate simulation in the nursing curriculum (NCSBN, 2013). One respondent of my study wrote "implementation is exhausting for the faculty." Time will

be an essential requirement of this faculty development program in order to acquire the experiential knowledge to effectively begin a simulation project, and use this teaching strategy.

My expectations for the first module, to partially write a business plan, may be overzealous for the time allowed, in which case it can be altered and/or the timeframes can be adjusted. The first module activity might be excessive. I will have to see what evaluations from the first participants provide as feedback. I would not be averse to allowing students to work in groups on Module 1 in particular. This would be most helpful for participants who work in the same facility and are enrolled at the same time.

This staff development program could also be offered to facilities for groups of educators, especially if they are beginning to develop a simulation program. This could be done on a consultant basis in person or through the platform management system (PMS) that will facilitate the delivery of this program. Minimal fees could be applied to maintain the program on the PMS and the activity from Module 1 could be a group project with activities in Modules 2 and 3 being individual activities.

Since voice-over will be applied to each slide in each module, it could be a paced, stand-alone offering that participants can complete at their convenience over an extended timeframe. Activities from each module could be e-mailed to the facilitator as previously directed. The certificate would not be awarded until all three modules are completed and the faculty development program would have an overall time frame of 1 year from enrollment to completion of all three modules.

Scholarship

Educators are good about asking students, “What is your source?” This is true of this postgraduate degree as well. I had never done research before, so my knowledge of the research process before starting my doctoral degree was very limited. I learned like most other students that everything should be supported by evidence, which means you spend an intense amount of time reading and analyzing sources for your proposal, as well as searching for articles that are appropriate to your study. Each step requires a new process while building on work that has already been completed.

The internet is now widely used, yet not always scholastically inclined. I was surprised at how valuable Google Scholar can be when searching for articles, and though the full article may not be available, one has the information necessary to find it somewhere else. I learned that not all databases provided by a university’s library have all journals, and consequently, you may have to purchase them, get them through Loansome Doc, or request assistance from your librarian.

I now realize that even though I knew the type of research I wanted to do, a research plan does not always work out, so a researcher must be able to describe the rationale for not using specific types of research designs. A quantitative design was my initial choice but finding an appropriate tool was very frustrating. The tool I chose as the source for my study, the USTI, was originally developed by Thompson (2011). This tool was used in a descriptive statistical study of Thompson’s, and I procured permission to use the tool and alter as necessary to fit my study. Study designs that I contemplated using included: (a) descriptive, where responses are placed in a database and trends are

identified: (b) correlation to measure the association between two or more variables or score sets, and (c) a comparison of how specific variables differ from each other as they relate to specific outcomes (Creswell, 2012). The tool could not be altered appropriately to fit any of those designs, so a qualitative method was most appropriate and I used the USTI as a basis for the qualitative inquiries on the questionnaire. I decided on a case study design using the nursing programs in my region as the case.

My literature search involved all types of studies, not just qualitative case studies, (ethnography, interventional studies, literature reviews, descriptive studies, etc.). I thought once the data were analyzed, it would be a simple matter of documenting my findings, but I was wrong. Self-analysis is very enlightening once you get past all the previous work. It is important to consider what to do with your data, how to present it, and what can you do for your fellow educators with what you have learned in your study. These all require further analysis of the information acquired from your research as well as an application of the results. Collecting data for the sake of research is not enough; just like evaluating anything else, it is important to consider what you will do with the information. The information acquired through analysis of the data provided the basis for a program to influence the issues identified in my original research study.

Project Development and Evaluation

The analysis of my data provided the background for my project development. My coursework and experience in education provided the basis for the structure of the project. Because my choice was an online offering to educators, the use of appropriate resources was essential. There are no textbooks for these modules, but the learner still

needs some guidance in the concepts to be acquired. This required research of a slightly different nature. I used Google search for the following terms (a) building a simulation lab, (b) writing a business plan for a simulation lab, (c) debriefing videos, (d) online templates for developing a simulation scenario, (e) moulage for simulations, and (f) vendors for simulation equipment. This search provided me a list of resources for use during my faculty development activities.

The make-up of the learner objectives provided an excellent source of evaluating whether or not a learner was able to complete the objectives assigned for the program. A Likert scale was the best way to answer those questions. Johnson and Christensen (2012) suggested using Likert scales with 4 to 11 choices depending on the distance between responses. Using a 4-point Likert scale eliminates the neutral or no new information capability. Choices on this Likert scale range from 1 *strongly disagree* to 4 *strongly agree* (Johnson & Christensen, 2012). Learners always have suggestions, so in order to facilitate the ability to gather this information, I added the open-ended queries to elicit information that may not be apparent on the Likert scale portion of the evaluation.

Leadership and Change

Through this project (and actually through life), I have learned that change is inevitable. Nursing is one of the professions that is wrought with change, so I have spent my entire life changing my practice to keep up with the latest standards. I would say that I have always been a leader and a change agent. I have been an educator for 10 years, and a nurse for many more, so I have seen some things go and then return again. I am extremely pleased that my respondents were so open with their responses to provide what

is needed by a change agent to move a process forward. In this instance, the process is use of simulation as a teaching strategy. I have been very fortunate to work with faculty who are open to change and have the student's best interest at heart, which makes them adapt very well to new teaching strategies.

Analysis of Self as Scholar

Through this project, I have learned that although I knew what to concentrate the project on, I had no idea of the steps to which I would be required to go in order to accomplish this dream. My first major block came in trying to decide on a tool for the study. I have learned to reevaluate everything I am doing, looking at the possible limitations and alterations that may be necessary to be a successful endeavor. This is true personally, professionally, and as a scholar. I always tell my nursing students to have plan A, B, and C in case the unexpected occurs, and that is true for everyone. All people regardless of their profession should have other plans available. As a scholar, who is also employed full-time, I must take advantage of every minute and plan all my activities to allow an appropriate timeframe for success. Teaching for me is very time-consuming because I am not a "spur of the moment person." I have to plan everything I do, including my lectures. I also constantly redo what I already had done, making lectures each year a work-in-progress.

Analysis of Self as Practitioner

I believe research is essential to change, but it needs to be research that will indeed affect change, not just the collection of data. I have seen people quickly fill out evaluations from conferences, just to get it done, without applying much thought to the

effect they could have on future events. I have seen the same thing with our students. I always look at my evaluations with change in mind. I feel my courses are always "a work in progress" and the evaluations will only make my courses better. So as a practitioner I am always striving to be better in everything I do. This project and degree are not an exception to that philosophy. I have seen myself grow through this process as an educator, student, and as an adult. I can now empathize with those coming after me and sympathize with those who went before. I know why people give up part way through this process. I am proud that I have stayed on the path to completion and am hopeful that the project I have developed will be implemented.

Analysis of Self as Project Developer

My study has given me the information needed to develop a project for busy working full-time or part-time faculty who wish to adopt simulation into their teaching repertoire. Having said this, I know I would never have really conducted research on my own had it not been a requirement for graduation. It is definitely time consuming, unless it is something you do on a daily basis.

I think I now see why there is a need for more nursing research. It is hard to accomplish when you are working full-time and with budgetary constraints many employers no longer allow sabbaticals for the purpose of furthering your education. This is why providing these faculty development workshops, online webinars, and conferences are important. Just like online education, online faculty development makes sense to meet the learners where they are currently. The modules I developed for my project

contain valuable information in a compact source that can be accessed when the learner has time, yet requirements are in place to minimize the potential of procrastination.

My experience in redesigning online courses has helped me to develop these online modules. Key principles of andragogy are that the adult learner is autonomous and self-motivated, goal-oriented, and that the knowledge needs to be relevant to their current needs (Merriam, Cafarella, & Baumgartner, 2007). The essence of this project is the fact that it relates to current teaching strategies for nurse educators, it is accessible to the learners when most convenient for them, and it allows the pace appropriate to their time constraints. I believe that while only a small sample of participants provided the results analyzed in my study, the results coincide with previous studies in the literature making the information relevant. The relevancy of the study results and the themes identified in my analysis make-up the basis of this faculty development program.

Reflection on Importance of the Work

This project was developed based on findings of my original study and although some of my findings were not surprising, such as simulation requires planning and training, other results were surprising to me. I surmised that programs with active simulation use and large simulation labs would see themselves as having successfully integrated simulation into their curriculum. I found that not all of them see their integration of simulated experiences into their curriculum as successful for various reasons.

I was also unprepared to see comments identifying that faculty do not understand simulation. I do realize they may not have worked with simulation. For this reason, I see

importance in the staff development program I developed based on my study data. The first activity in each module does not require a submission, but does allow the opportunity to see some of the concepts in action for visual and auditory learners. The second activity of each module requires active participation in the activities. It also provides numerous resources for each of the participants to reflect upon. The program requires them to submit an assignment that will provide a documentation of interaction with the resources and an application of the concepts discussed and resources provided.

The Project's Potential Impact on Social Change

Since the publication of Benner et al.'s (2010) call for the transformation in nursing education, nursing programs have struggled to effect change in how we provide education to our nursing students. HFS is a teaching strategy that has evolved from this transformation of our educational trajectory. Social change as it relates to this project's design will be seen in future educators equipped to begin using HFS in the curriculum of their nursing programs. Education for educators needs to pique the interest in applying what is learned to our practice, which I believe my project can and will do. Other studies have identified some of the same themes, which strengthens the need found to provide knowledge in the use of HFS to educators. It can be likened to a closed circle of education. We as educators learn about simulation as a teaching strategy, and then we provide learning opportunities to our students in the format of a simulated experience, which the students in turn apply to their practice.

Implications, Applications, and Directions for Future Research

My study introduction identifies the need to add to best practice elements for successful integration of HFS into the nursing curriculum. For many nursing programs this is a new teaching modality, but one which comes at a high cost. Respondents to my study questionnaire identified a perceived lack of HFS knowledge, lack of faculty training relating to HFS, lack of financial resources to support HFS, lack of planning for HFS, and lack of debriefing in HFS. This might possibly be the result of inadequate planning for the adoption of HFS into the nursing curriculum. The INASCL (2013) *Standards of Best Practice* address some of the issues but do not provide guidelines on how to accomplish these standards. The results of the national study conducted by NCSBN also provide guidelines as standards in the conduction of their study.

The research study and project identified and developed from the resultant data identify a potential need for an education plan to address the perceived lack of knowledge pertaining to the use of HFS. Providing education through an online format might be more affordable than conferences or seminars, as well as accommodating time factors such as busy full-time work schedules. Faculty development detailing the principles of simulation and the elements necessary to affect a simulated experience for students would facilitate knowledge of simulation. Practice in writing a formal plan for the adoption of HFS into a nursing program, writing simulation scenarios, and writing an outline for the facilitation of a debriefing session may assist educators to be open to the adoption of simulation.

Future research should be conducted to attempt to determine the best debriefing style to affect student learning. Although research states most of the learning occurs in the debriefing phase of a simulation, research has not really supported this assertion. Levitt-Jones and Lapkin (2014) conducted review of articles evaluating the use of HFS debriefing as a means to increased acquisition of knowledge. Although they found evidence of significantly improved posttest performance after a simulated experience, the improvement was in the performance of skills, which does not necessarily equate to knowledge acquisition. Future research should also be considered for the student learning outcomes, which were identified in my study as well as by Mariani and Doolen (2016). Is the application of HFS improving NCLEX pass rates, and improving patient safety outcomes in the clinical setting? Although NCLEX pass rates was offered in my study as something the participants could choose when identifying program and student outcomes they felt they had seen improve with the use of HFS, no one chose these pass rates. It may be that it is too soon to tell yet if HFS has affected these tests, but future research should attempt to answer this question.

Conclusion

Nursing education is a practice-based entity where the nurse educator teaches both the didactic, science-based curriculum along with the hands-on clinical practice with real patients in a hospital, clinic, or long-term care facility. Patient safety is paramount to all aspects of health care since the Institute of Medicine published, *To Err is Human* (Kohn, Corrigan, & Donaldson, 2000). Currently, it is becoming more difficult to place students in the clinical settings, hospitals have more control over the number of students

and faculty allowed in the clinical settings, and nursing schools are being expected to graduate nurses faster. To add to this dilemma, nursing education is being expected to change how faculty educate nurses. These changes have resulted in the use of HFS to provide an environment where students can practice nursing skills in a safe environment, to substitute for some of the clinical requirements, and to alleviate the issue of too many students for the clinical facilities to handle.

Research conducted relevant to the topic of simulation has identified numerous barriers, incentives, and modes of delivering education on the use and application of HFS in the educational and practice arenas. The research I conducted as part of this study identified perceived faculty lack of knowledge and training to work with HFS. It also identified a need to develop formalized plans that include planning for financial obligations of adopting HFS. Debriefing of students after a simulated experience is also lacking as noted both in the data of this study and in the literature. Nursing education is charged with meeting the needs for the future as the baby-boomers become older adults and the projected nursing shortage becomes evident. HFS, although expensive to undertake, may be needed for the future of nursing and intraprofessional education to address the safety and potential outcomes of our patients.

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Appendix A: Faculty Development Project

A three-module, 6-week Faculty Development Program

High-Fidelity Simulation:

Adopting Simulation, Scenarios, and Debriefing

Linda Howell, MSN, RN

Overview of the Program

Program Description

The program is divided into three modules, each 2-weeks in length. Educators new to simulation or new to academia will learn about adopting simulation. The first step begins with a champion (someone who truly sees the benefits of simulation) to push for simulation and develop a plan to for the rest of the program. These three modules will teach you about developing the plan, writing simulated scenarios, and debriefing students after a simulated experience. Many resources are provided.

Program Outcomes

The purpose of this faculty development program is to:

- Increase the knowledge of nurse educators concerning simulation as a teaching strategy.
- Enhance knowledge and skill in writing scenarios for high-fidelity simulated experiences.
- Enhance the knowledge and skill for use of debriefing techniques.

Program Learning Objectives:

After completion of the program, the learner will be able to:

- Identify resources in the development of a simulation lab plan.
- Determine necessary equipment for constructing a simulation lab.
- Evaluate approximate costs for construction of a simulation lab.
- Construct the beginning financial plan for the development of a simulation lab.

- Identify necessary components for development of a high-fidelity simulated experience.
- Compare various available online templates for use in high-fidelity simulation scenario writing.
- Determine means and equipment necessary to "suspend reality" in simulated experiences and scenarios.
- Develop a scenario for a simulation experience for students.
- Define the process of debriefing.
- Compare research findings related to the process of debriefing and the different ways of conducting debriefing exercises.
- Describe what makes debriefing "the most important" part of the simulation experience.
- Develop a debriefing outline for a simulated scenario.

Program Format

These PowerPoint slides with voice over will be loaded onto a platform or Learning Management System for the purpose of providing online training or learning for nursing educators. These will be delivered in modules which have an interactive component and activity due prior to beginning the next module. Feedback will be provided by the facilitator. Prior to beginning the modules will be a Self-Assessment. At the conclusion of the third module will be an evaluation provided in an e-mail with a link to SurveyMonkey to fill out an evaluation of the program (see last page of Appendix A).

Premodule Self-Assessment

Please mark each of the following based on your assessment of your needs &/or skills in relation to the questions.

1. My school of nursing currently:

is thinking of building a simulation lab	
has a simulation lab that is being actively used	
has a simulation lab that is not actively used	
needs to enlarge our simulation lab	
has developed a formal plan, but not yet procured funding or ordered equipment	
We have donors or funds available to fund the lab, but no formal plan yet developed.	

2. If the school of nursing is thinking of building or remodeling for a simulation lab, how was the decision to adopt simulation determined?

Simulation is currently used in our courses, but more space is needed	
Administration determined the faculty would begin to use simulation.	
Some of the faculty (simulation proponents) pushed for the adoption of simulation and a lab.	
All faculty members discussed the benefits and challenges of simulation and have determined a lab is needed.	
Faculty have brainstormed and mapped how best to integrate simulation into their courses.	

3. What is your current level of expertise in working with simulation? (mark all that apply)
    a. I have never used nor seen a simulation.
    b. I have only watched simulation in use.
    c. I have assisted in a few simulations
    d. I have developed a simulated experience for my course/s.
    e. I have written the scenarios used in my course/s.
    f. I have actively debriefed students after a simulated experience.
    g. I have written the scenario, conducted the experience, and debriefed the students.
    h. I see no reason to use simulation in any courses in our curriculum.

4. Which of the following best describes your attitudes about using simulation? I
    a. Use simulation in my course/s and would like to learn more.

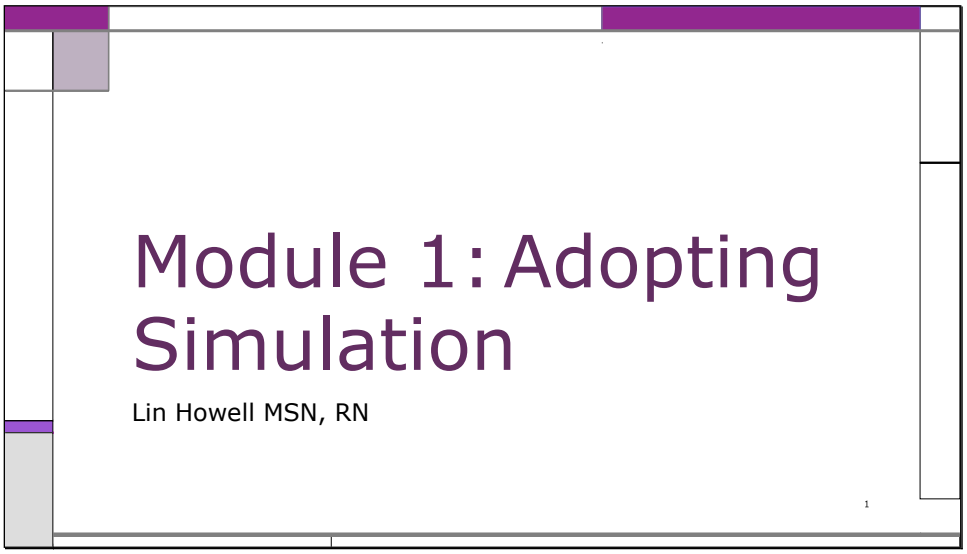
   b. Have some knowledge of simulation
   c. Would like to learn more about simulation
   d. Prefer not to use simulation
   e. See no possible application to teaching nursing students
5. How many of the current faculty members in your facility have been trained in simulation techniques?
   a. 0–5
   b. 6–10
   c. 11–15
   d. 16–20
   e. More than 20
   f. All of the faculty

6. How many students populate your classrooms in one setting?_____students

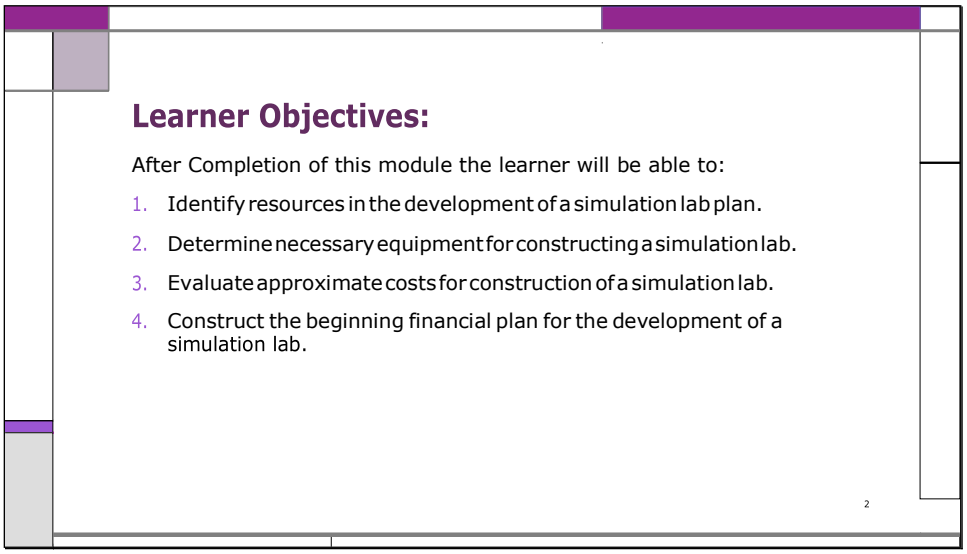
7. How many students populate each clinical group?_____students

Module 1

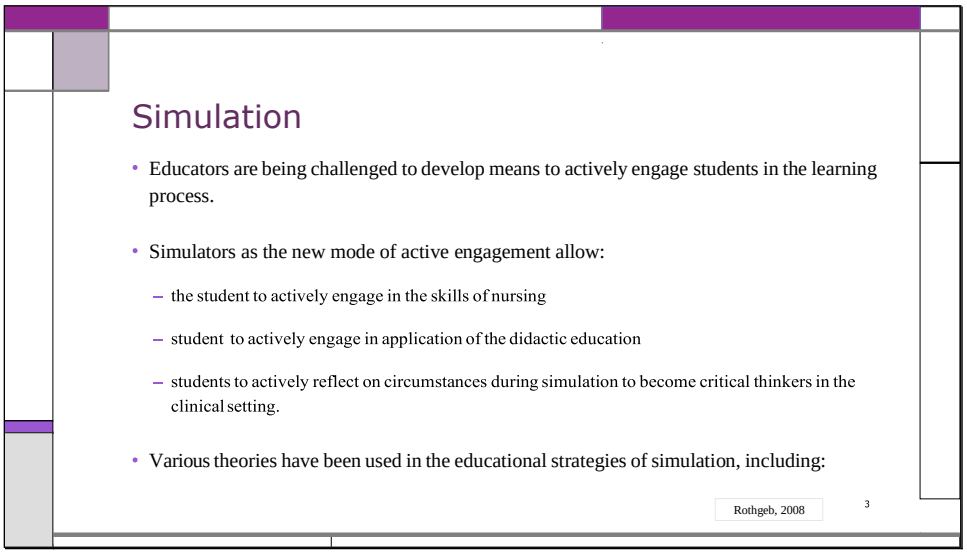
Slide 1



Slide 2


Learner Objectives:
After Completion of this module the learner will be able to:
1. Identify resources in the development of a simulation lab plan.
2. Determine necessary equipment for constructing a simulation lab.
3. Evaluate approximate costs for construction of a simulation lab.
4. Construct the beginning financial plan for the development of a simulation lab.
2

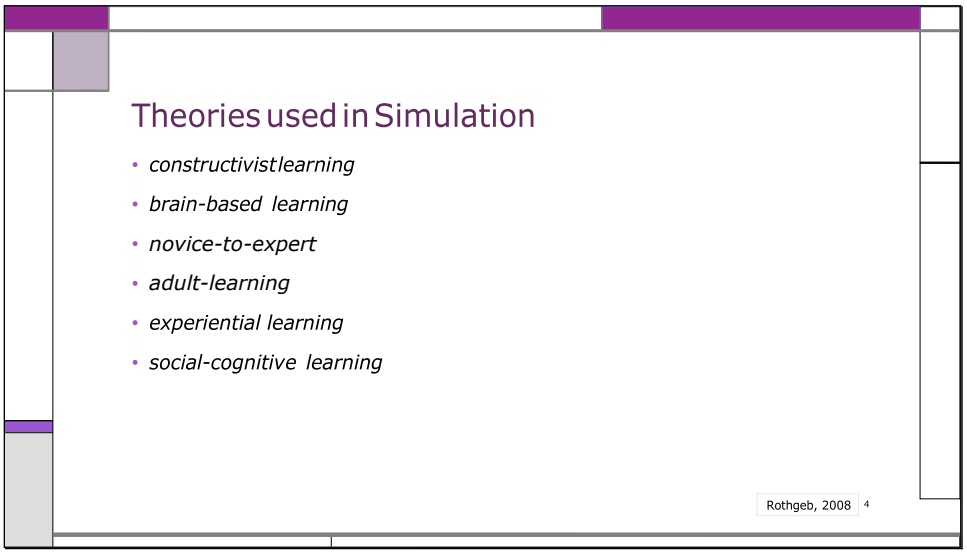
Slide 3



Because of the projected nursing shortage nursing programs are being challenged to admit and train nurses faster.

Nurse educators are frequently concerned about all they "need" to teach, so the addition of simulation is an excellent time to review the curriculum and take out some of the material and replace some teaching strategies with simulation.

Slide 4



- *constructivist learning* – the learners *a*ctive participation creates knowledge, based on the experience in which they participated

- *brain-based learning* - uses the ability to process the experience and alter learning from basic to more complex abilities

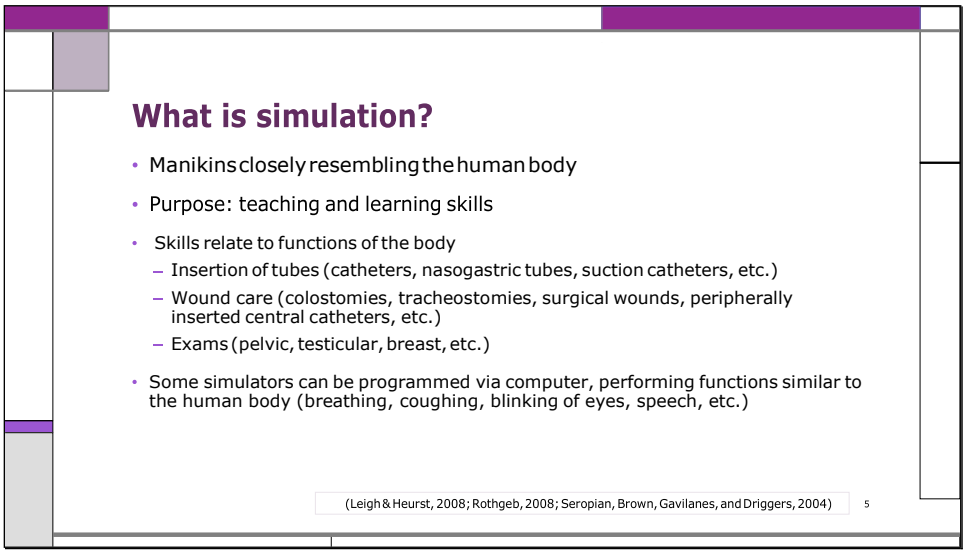
- *novice-to-expert* - promotes growth based on experiences from novice (beginner) to expert (experienced)

- *adult-learning* - adult learners are mostly self-motivated, have preset goals, and their learning centers on relevant content

- *experiential learning* - repetition and reflection improve skills, outcomes and create permanent new knowledge based behaviors

- *social-cognitive learning* - behavior, personal factors, and environment interact cause learning and are dependent on each other.

Slide 5



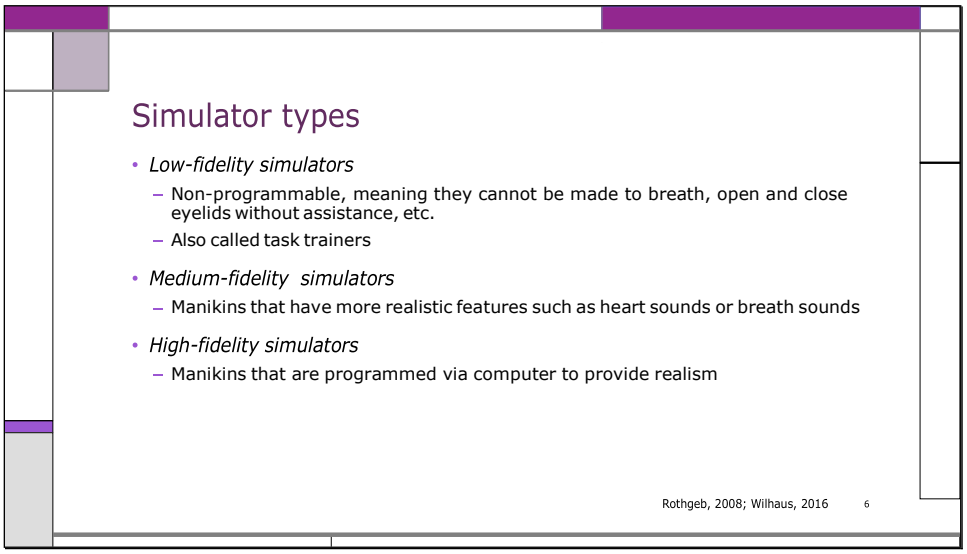
Simulation in nursing has been adopted from the fields of aviation and medicine. Its use in nursing is related to

- Lack of clinical sites
- Lack of faculty to oversee students in the clinical sites
- Rapidly changing patient census
- Safety factors (patients, students, facilities, and nursing schools)

The manikin can also be an arm (for IV practice or shots); a torso for trach care, wound care, breath sounds, heart sounds; a head and torso for BLS training; pelvic model for exams; etc.

High-fidelity simulators can be programmed via computer, to react to human interventions allowing students to affect changes to improve patient outcomes (Leigh & Heurst, 2008; Rothgeb, 2008; Seropian, Brown, Gavilanes, & Driggers, 2004).

Slide 6



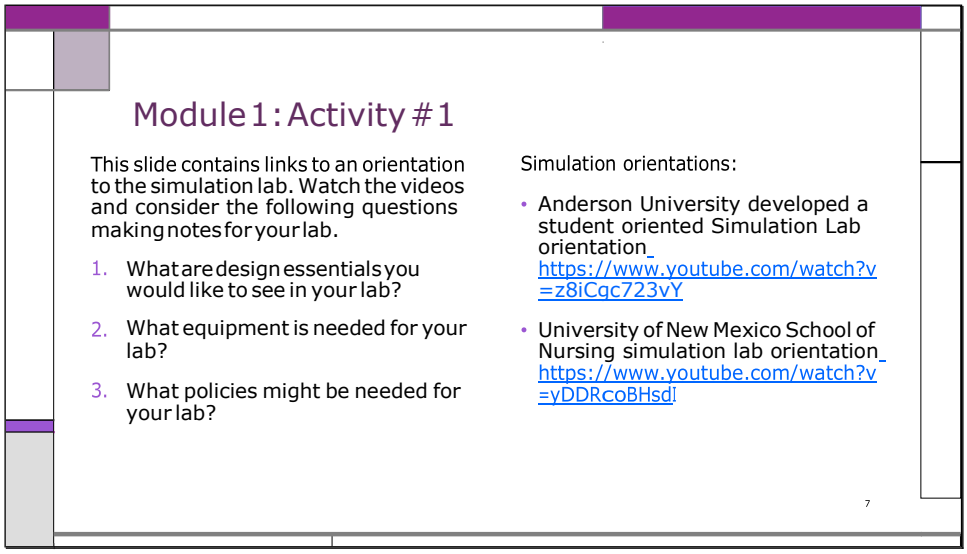
***Low-fidelity simulators*:** EX: an arm where intravenous insertion can be done, a half-torso, with various indwelling IV ports for practicing sterile dressing changes, an abdominal torso with wounds to practice wound care, an upper chest torso with a tracheostomy to practice providing tracheostomy care (see Resources).

***Medium-fidelity simulators*:** allow student to practice a skill, IV insertion, urinary catheter insertion, pelvic exam, breast exam, testicular exam, etc.

***High-fidelity simulators*:** Allow students to use assessment skills, communication skills, delegation, role practice, and critical thinking

- Programmed by faculty or technicians behind a one-way window to allow visualization of student actions
- Monitor in patient room shows changes in vital so students can pick-up on cues (increased or decreased oxygen saturation, changes in heart rate, temperature, blood pressure, etc.)
- Human physiological processes such as sweating, a change in skin color (due to lack of oxygen) can be demonstrated.
- Pharmacological effects of administered medications can be displayed
    - Sensors determine dosing of medications as they are being administered (see Resources).

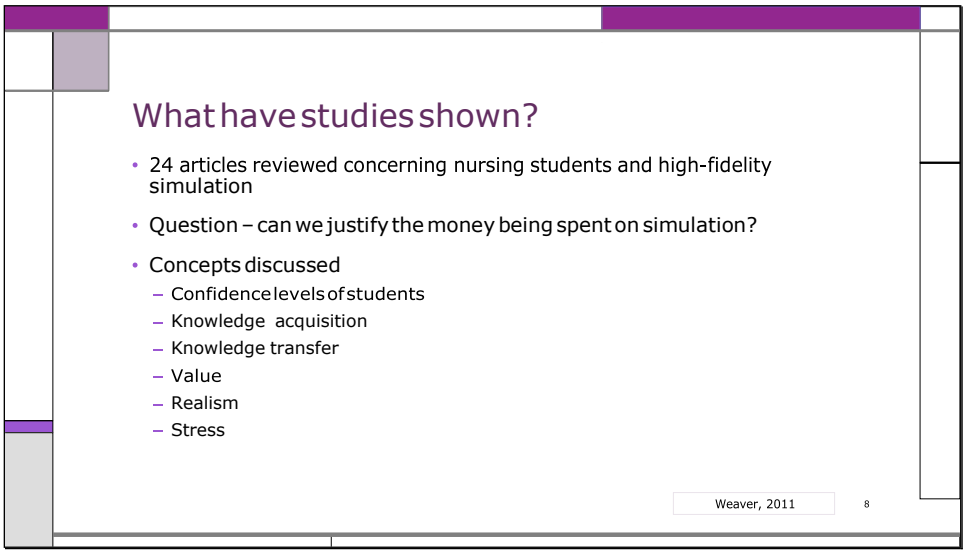
Slide 7



If you would like to see other videos relating to simulation labs, do a Google search using the terms you are looking for such as

YouTube AND _____

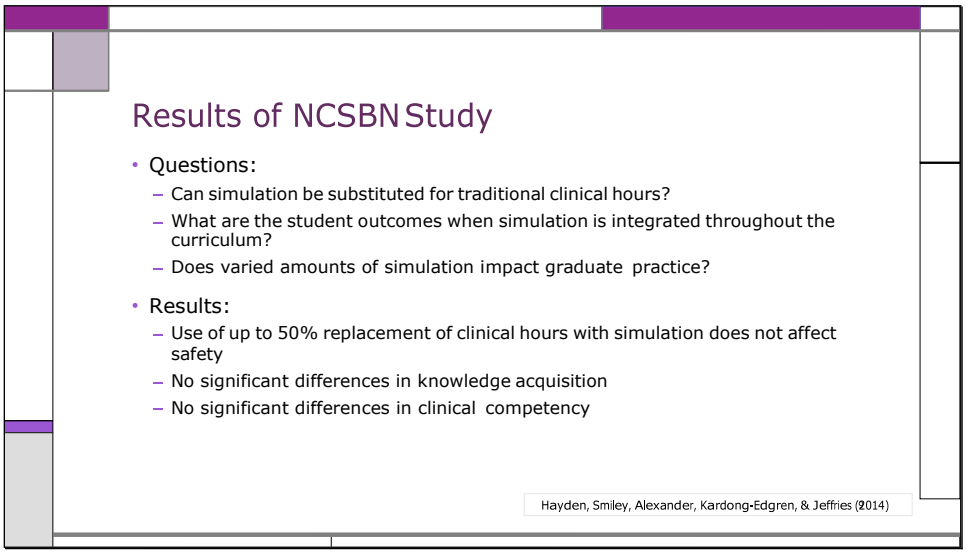
Slide 8



Results

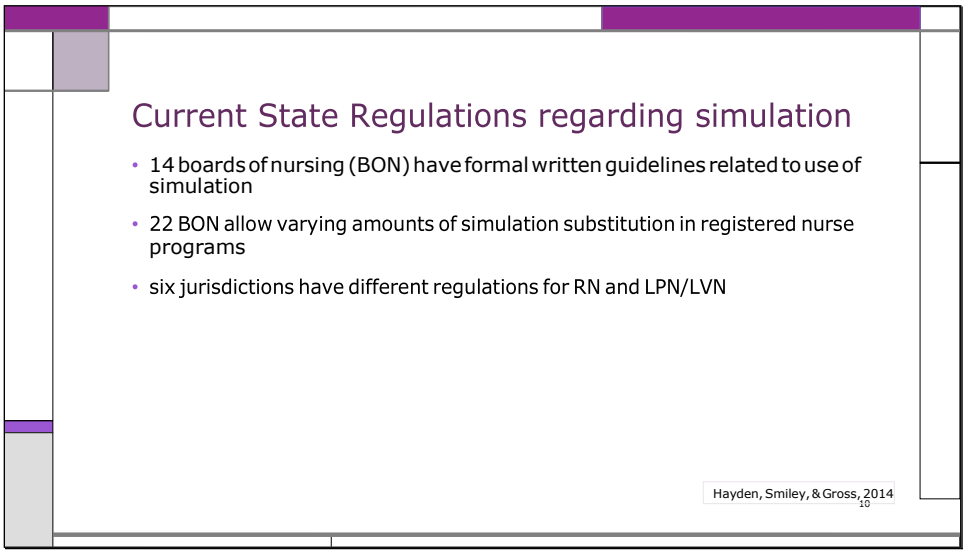
- ***Confidence levels*** (11 articles) - mixed results
  - increased confidence after completing a simulation and would be able to care for that type patient again
  - no increase in confidence and no research had shown any correlation between student perceived confidence and the transfer of said confidence to actual clinical settings
- ***Knowledge*** (two articles)
  - most students saw an increase in knowledge using simulation
- ***Knowledge transfer*** (two articles) - mixed results
- ***Value*** (three articles) mostly positive results from simulation
- ***Realism*** (five articles) - students had a feeling of being in a real-life situation while in the simulation and felt it was an important piece of the experience
- ***Stress levels*** (four articles) – inconsistency noted on this concept
  - Two studies identified no difference in stress levels
  - two studies felt their stress levels were less when they encountered a hospital based clinical

Slide 9



- Conducted in 10 nursing programs (rural & urban settings) over a 3-year period
- Conducted in both baccalaureate and associate degree programs
- All faculty trained in the same way
- Uniform scenario development, uniform debriefing, uniform assessment and evaluation criteria

Slide 10

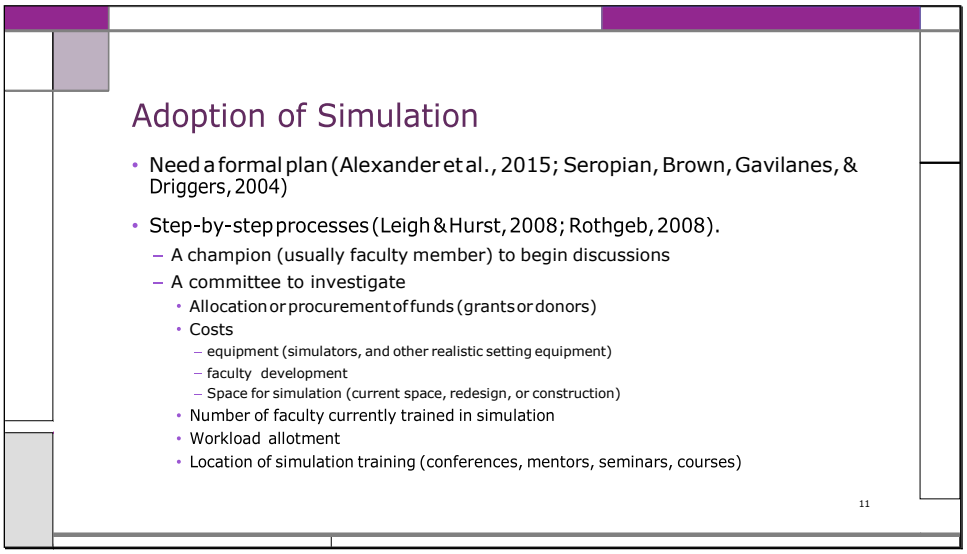


Since the results of the NSCBN study provides evidence that at least 50% of clinical can be replaced with simulated experiences, nursing programs may begin to request more substitutions. Currently According to Hayden, Smiley and Grant (2014) these were the regulations.

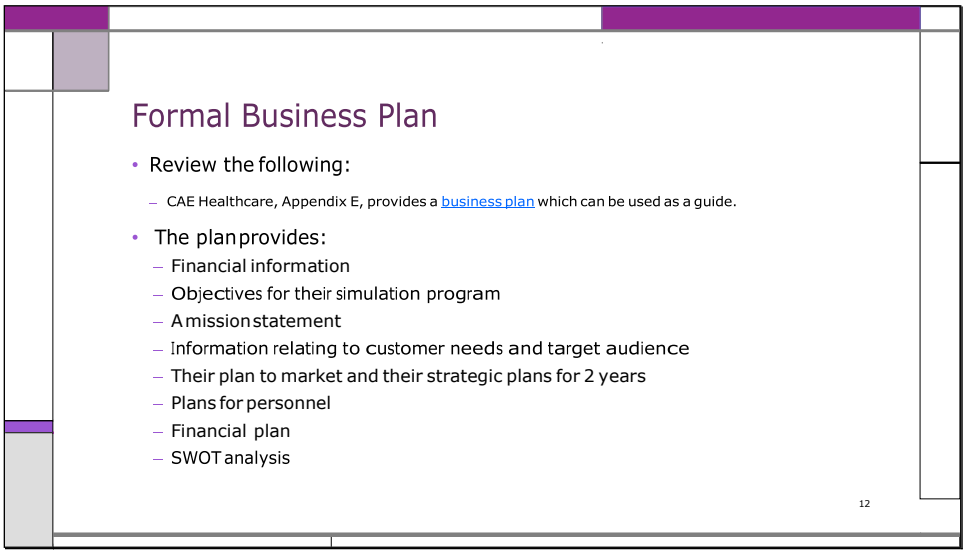
In an attempt to help nursing boards to determine readiness of nursing programs to attempt this substitution, an expert panel with representatives from INACSL, NLN, American Association of Colleges or Nursing (AACN), SSH, BONs and NCSBN developed national guidelines. These guidelines are based on data from the NCSBN study, INACSL Standards of Vest Practice: Simulation, and other resources (Alexander et al., 2015).

The guidelines stress "budgetary plans for sustainability and ongoing faculty training" (p. 40). The plan is also to describe resources available for simulation, Curriculum vitaes and other evidence of qualifications, description of spaces to be used for simulation, letter of support from school or university administrators, short and long-term goals as well as policies.

Slide 11


Adoption of Simulation
Need a formal plan (Alexander et al., 2015; Seropian, Brown, Gavilanes, & Driggers, 2004)
Step-by-step processes (Leigh & Hurst, 2008; Rothgeb, 2008).
A champion (usually faculty member) to begin discussions
A committee to investigate
Allocation or procurement of funds (grants or donors)
Costs
equipment (simulators, and other realistic setting equipment)
faculty development
Space for simulation (current space, redesign, or construction)
Number of faculty currently trained in simulation
Workload allotment
Location of simulation training (conferences, mentors, seminars, courses)
11

Slide 12

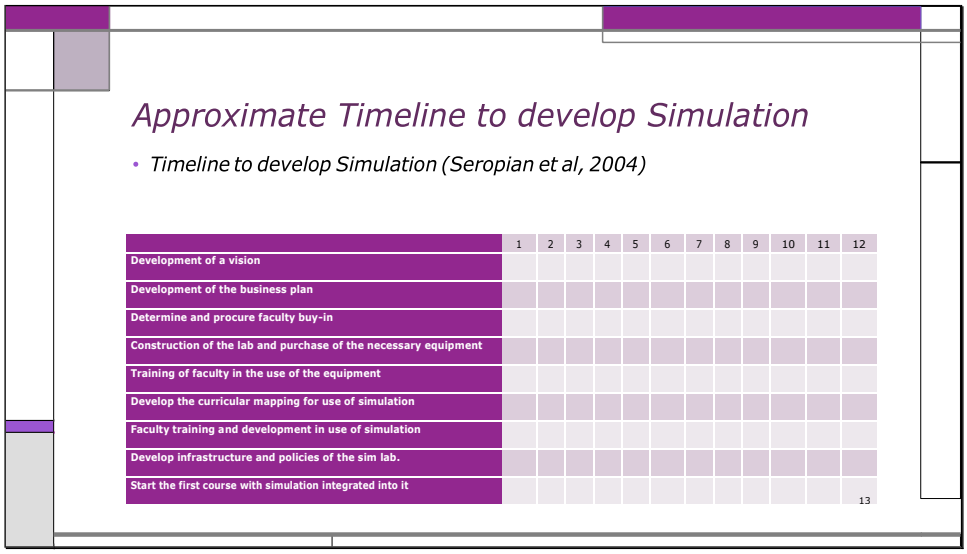


E-mail me at XXXXXXXX with any questions you may have.

After review of this plan, you will begin to write a plan for your nursing program. If there are several faculty from 1 school, please work on this together.

Be sure to check **Module 1: Activity #2** to determine what will be required in your plan.

Slide 13



**This is an approximation as some programs will go slower and some may go faster.

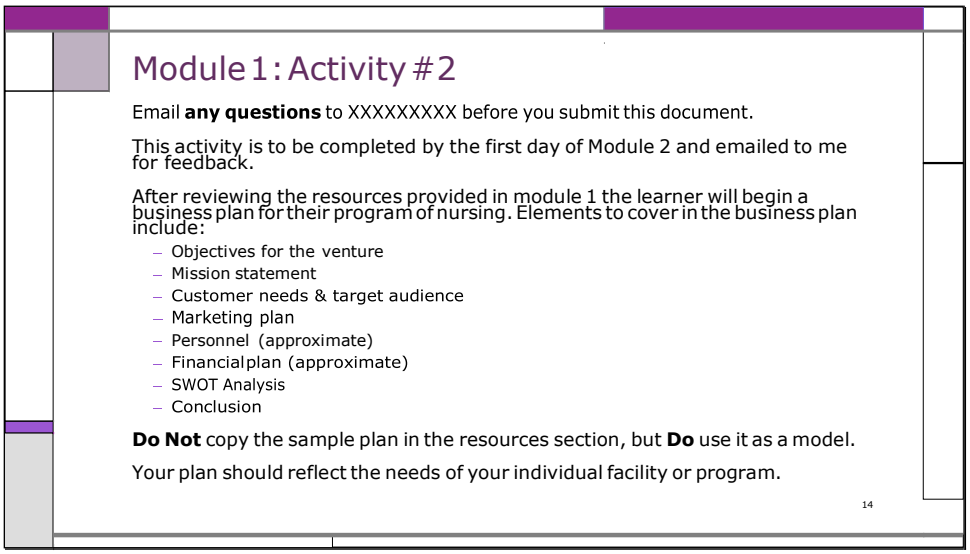
A study by Taplay, Jack, Baxter, Eva, and Martin (2015) describe the seven steps of adopting simulation in Ontario, Canada.

- Securing resources
- Leaders working in tandem
- "Getting it out of the box" literally this was an issue with 1 particular site
- Learning about simulation and its potential for teaching
- "Finding a fit"
- Trialing the equipment
- Integrating into the curriculum

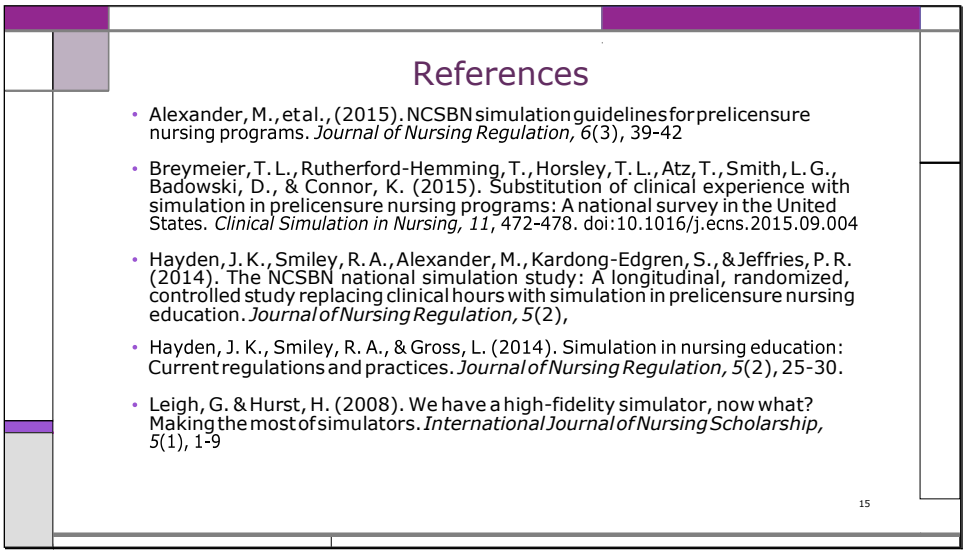
There were 13 sites with some accomplishing the adoption of the simulation program into all curricular levels averaging 3–5 years. Somewhere completed in 2 years, others took up to 8 years.

They recommend not underestimating the level of resources needed to actually get a program completely up and into all levels of the curriculum.

Slide 14


Module 1: Activity #2
Email **any questions** to XXXXXXXXX before you submit this document.
This activity is to be completed by the first day of Module 2 and emailed to me for feedback.
After reviewing the resources provided in module 1 the learner will begin a business plan for their program of nursing. Elements to cover in the business plan include:
– Objectives for the venture
– Mission statement
– Customer needs & target audience
– Marketing plan
– Personnel (approximate)
– Financialplan (approximate)
– SWOT Analysis
– Conclusion
Do Not copy the sample plan in the resources section, but **Do** use it as a model.
Your plan should reflect the needs of your individual facility or program.
14

Slide 15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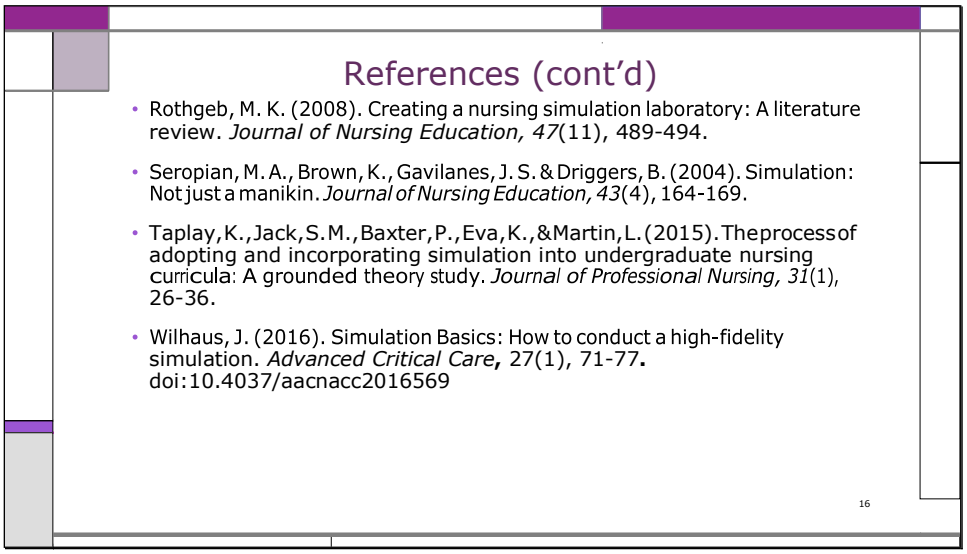
15

Slide 16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16

References for Activity #1 & #2

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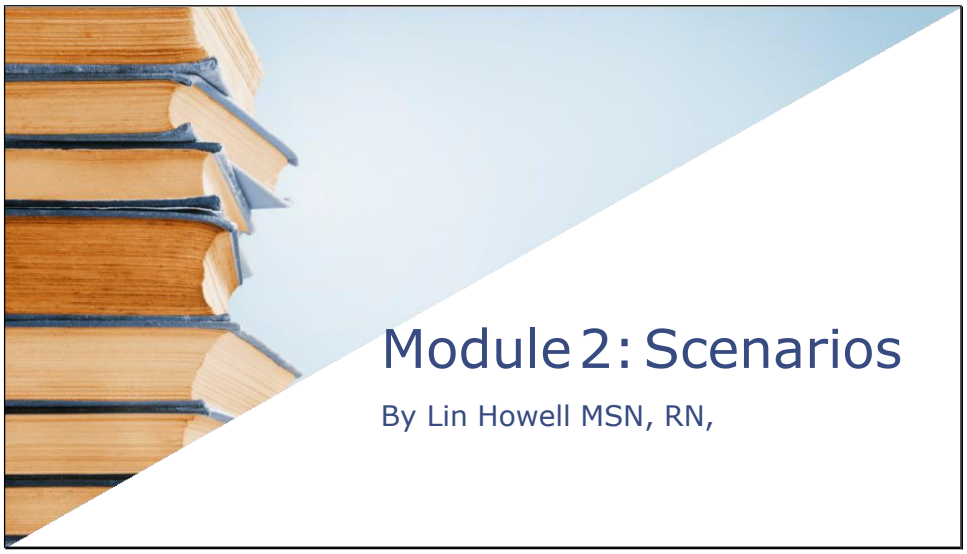
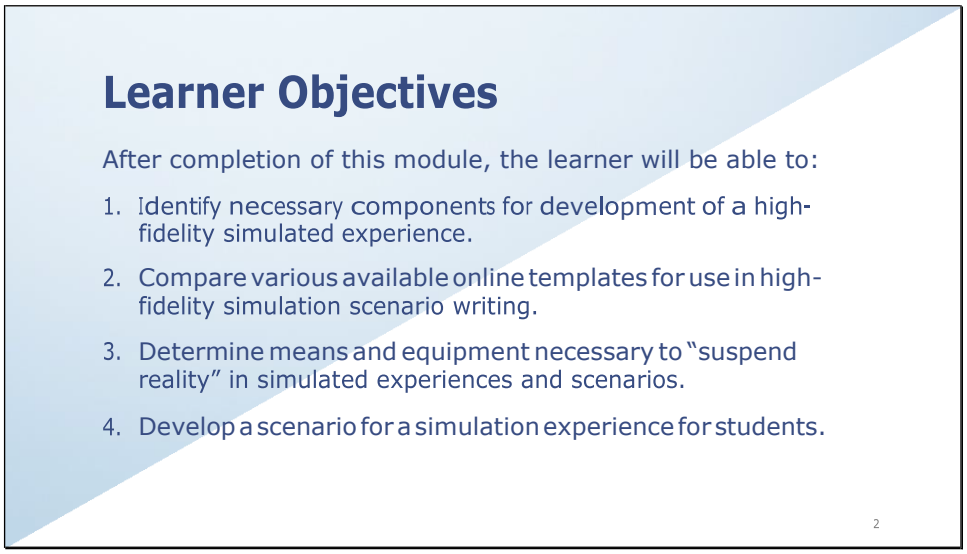
Module 2

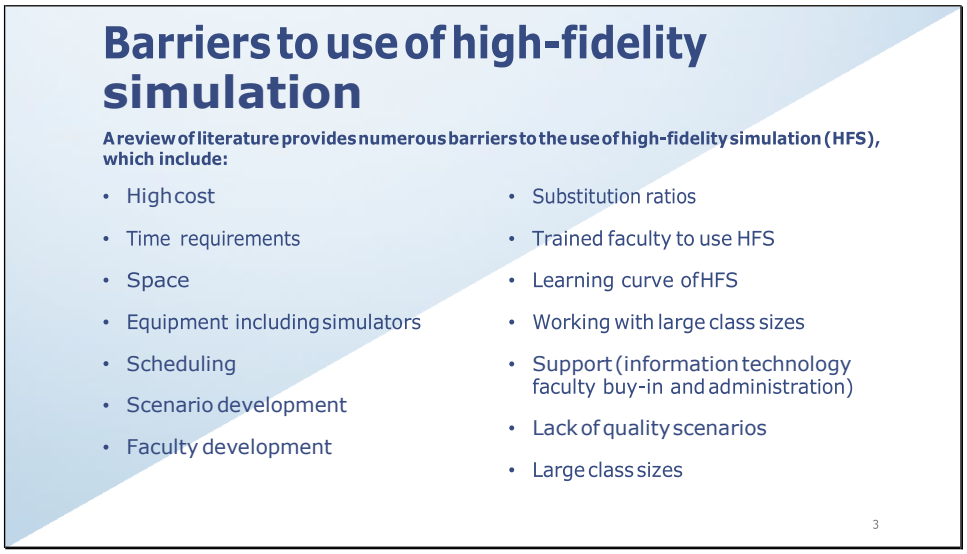
Slide 1



Slide 2


Learner Objectives
After completion of this module, the learner will be able to:
1. Identify necessary components for development of a high-fidelity simulated experience.
2. Compare various available online templates for use in high-fidelity simulation scenario writing.
3. Determine means and equipment necessary to "suspend reality" in simulated experiences and scenarios.
4. Develop a scenario for a simulation experience for students.
2

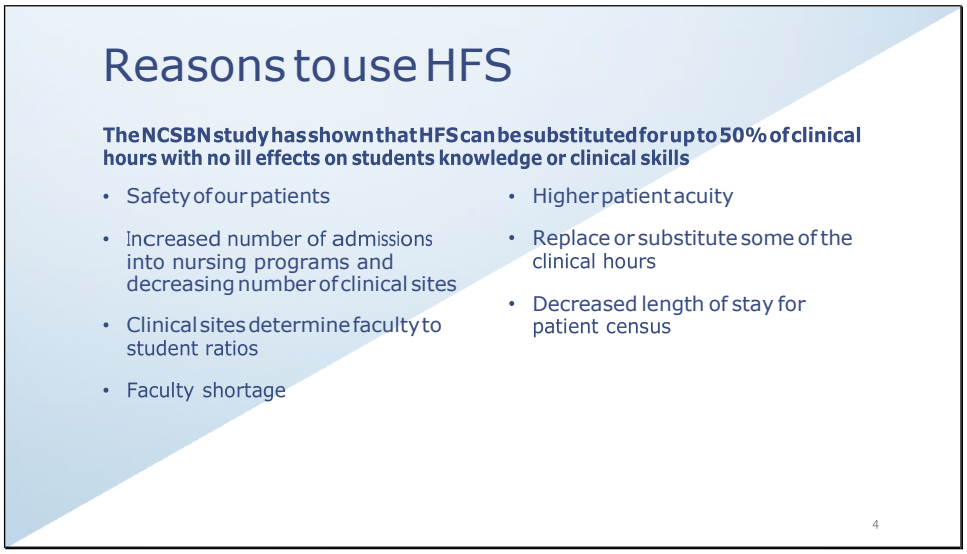
Slide 3



Literature is replete with research and studies conducted to determine barriers to the use of HFS (Adamson, 2010; Akhtar-Danesh, Baxter, Valatis, Stanyon, & Sproul, 2009; Aldridge, 2016; Anderson Bond, Holmes, & Cason, 2011; Howard, Englert, Kameg, & Perozzi, 2011; Jansen, Johnson, Larson, Berry, & Brenner, 2009; Jansen, Berry, Brenner, Johnson, & Larson, 2010; Kardong-Edgren, Starkweather & Ward, 2008; King, Moseley, Hindenlang, & Kuritz, 2008; Nehring, Wexler, Hughes, & Greenwell, 2013; McNeill, Parker, Nadeau, Pelayo, & Cook, 2012; Dowie & Phillips, 2011; Nguyen, Zieler, & Nguyen, 2011; Hanberg, 2008; Jones & Hegge, 2008; Duvall, 2012; Schlairet, 2011; Miller & Bull, 2013; Davis, 2012; Harder, Ross, & Paul, 2013; Arthur, Levitt-Jones, & Kable, 2013; Thompson, 2011).

My study identified the same barriers (time, staff, training, familiarity with simulation, funding, space, scheduling, communication, lack of quality scenarios, large class size, and maintenance of equipment).

Slide 4



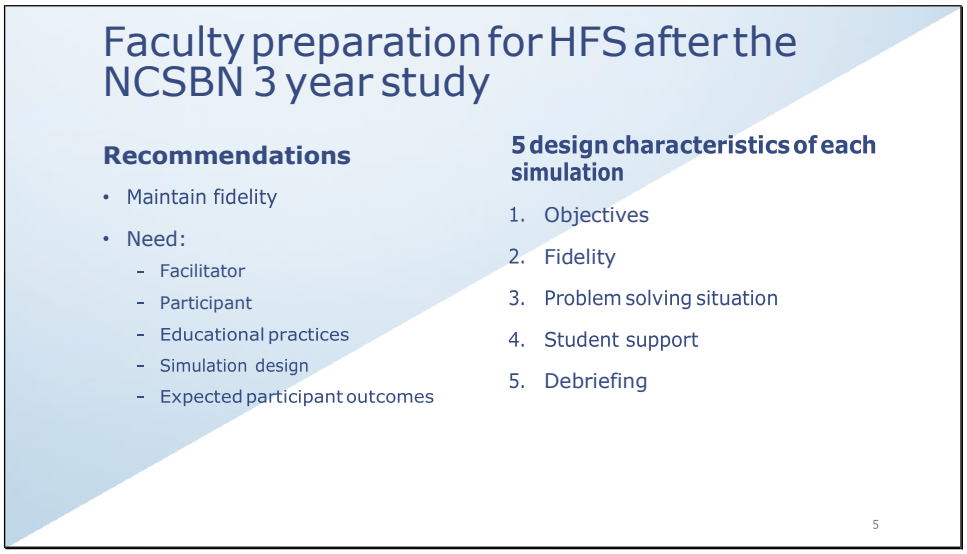
HFS allows student to practice skills without harming a patient (Aggarwal, et al., 2012; Coleman et al., 2011; Gantt & Webb-Corbett, 2010; Ironside, Jeffries, & Martin, 2009; Sears, Goldenworthy & Goodman, 2010; Shearer, 2013; Tanicala, Scheffer, & Roberts, 2011).

The increased admission into nursing schools to compensate for the nursing shortage predicted as baby boomers retire has decreased the available sites for student nurses to practice (Katz, Peifer & Armstrong, 2010; Hayden, 2010; Kardong-Edgren, Wilhause, Bennet, & Hayden, 2012)

Patients admitted are now sicker than in the past making their patient acuity higher, and most patients do not stay long, making shorter length of stays.

Due to patient safety issues, the average for student to faculty ratios are now as high as 10:1 and as low as 6:1. These ratios require nursing programs to scramble for available clinical site and clinical faculty. Added to this is the shortage of nursing faculty.

Slide 5



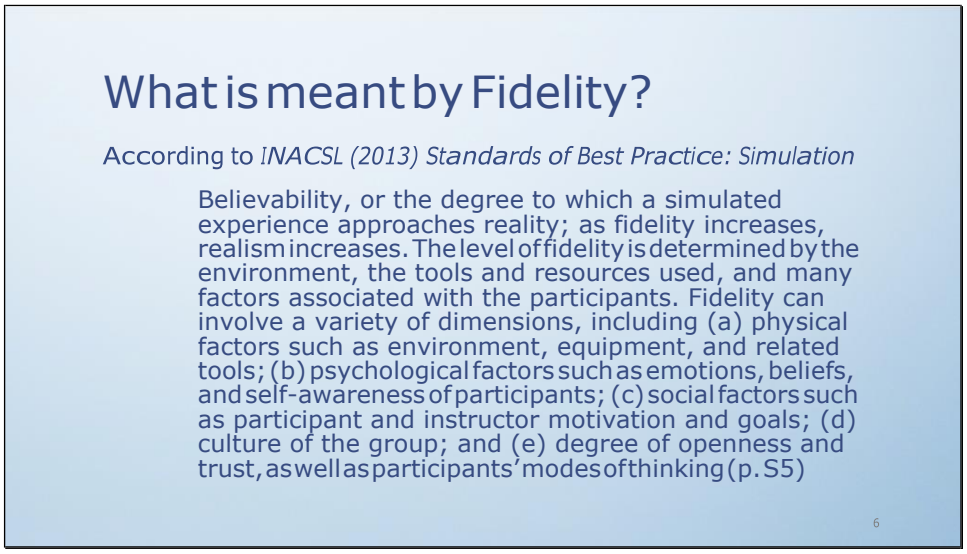
Jeffires, Driefuerst, Kardong-Edgren, and Hayden (2015) identified recommendations based on the study conducted by the NCSBN.

It was concluded that previous training from simulator vendors was not sufficient. Therefore,

- Each site (10 sites) had a "simulation team" (coordinator, faculty or staff) who were involved in simulation or traditional clinical arenas
- All teams over a 12-month period in 2011 spent 2-3 days in immersive workshops.
- Each workshop taught the same techniques for conducting a simulated experience.
- The simulation team conducted all simulations AND the debriefings and clinical faculty scored their own students during the simulations

Simulation scenarios should include what you want the students to achieve during each designated simulated experience. These should be mapped through the curriculum and focus on the QSEN competencies as well as communication rubrics such as the SBARR.

Slide 6

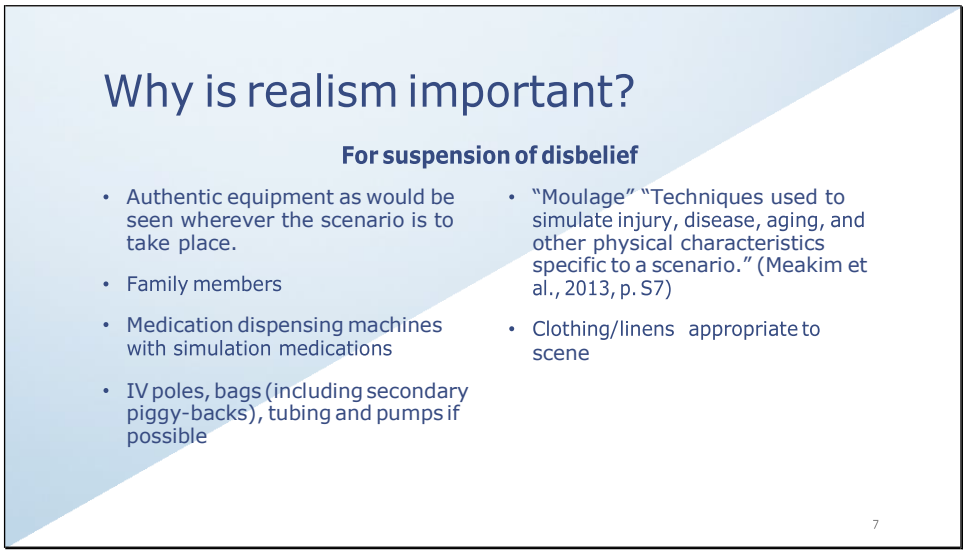


INACSL (2013) stresses the need to make the environment as real as possible so that students view these simulated experiences as real-life.

Students have difficulty accepting "pretend" situations and props that do not look like an actual patient environment in the acute care setting.

Willhaus (2016) identifies the need for "realism" to increase active engagement of the participants in the simulated experience.

Slide 7



If this is a patient room, have over bed table, hospital bed, bedside stand, a wall head board with suction, oxygen, etc.

Have the patient dressed in a hospital gown if admitted, or their own clothing to simulate an admission situation.

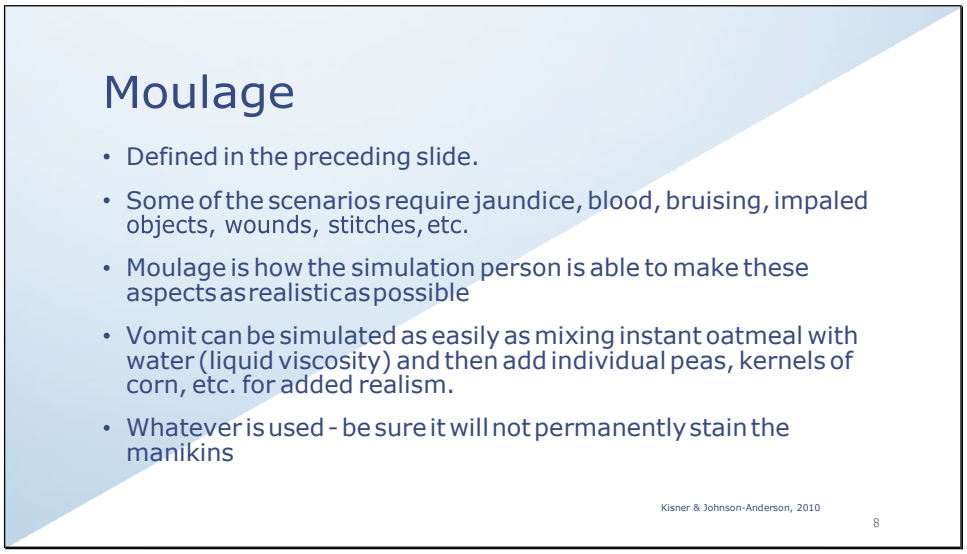
A whiteboard for information appropriate to the patient.

IV poles and pumps when used. Label bags appropriately if they are a piggyback antibiotic. oxygen equipment (nasal cannula, venture mask, mouth piece for aerosol treatments, etc.)

Nasogastric tube to suction if necessary with tubing and the collection canister

A foley drainage bag connected to indwelling catheter when necessary.

Slide 8

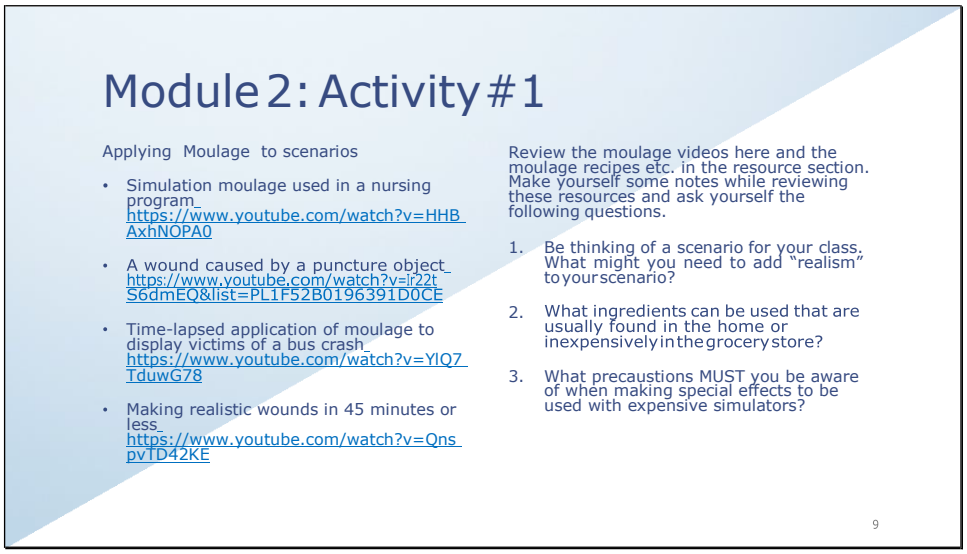


Kisner and Johnson-Anderson (2010) described doing simulation on a "shoestring budget".

There are vendors online that sell refurbished medical equipment.

Medical records can be ascertained from local hospitals willing to share.
Jaundice - yellow plastic wrap can be used cut into strip on the chest or an arm, etc.
Bruising and ecchymosis - Blue pool cue chalk or green and blue old eyeshadows can be brushed on then removed with soap and water.
Bile - dark gingersnaps and oatmeal cookies mixed with water in the blender

Slide 9

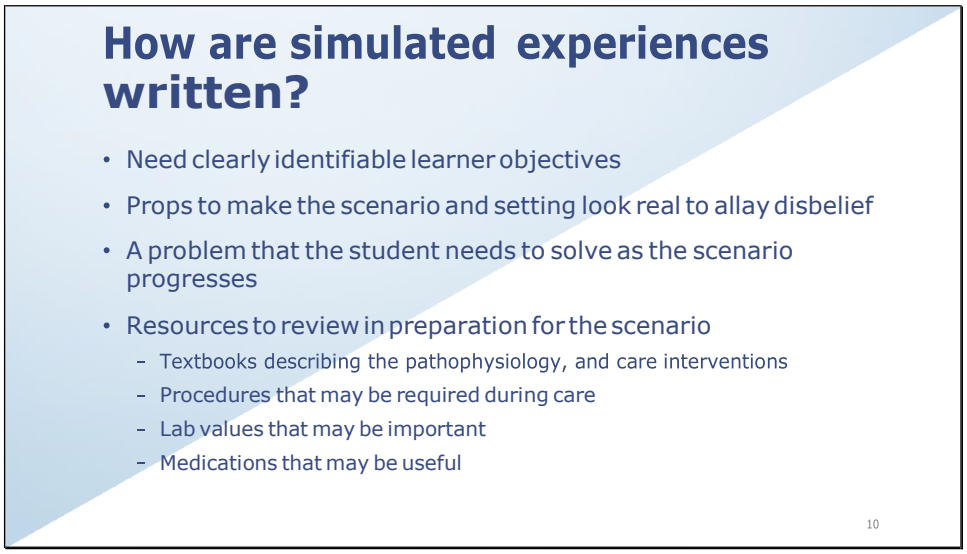


Refer to the recipes in the resource section that might be most relevant to making your potential scenario real for your students.

Creating "realism" helps the students get the most out of the simulated experience and "buy-in" to its being like a real-life experience that they might encounter on a hospital unit or in the community.

You might even want to practice some of these recipes and apply them to members of your family to see their effects.

Slide 10



Objectives for a respiratory failure scenario might be:
By the end of the scenario:

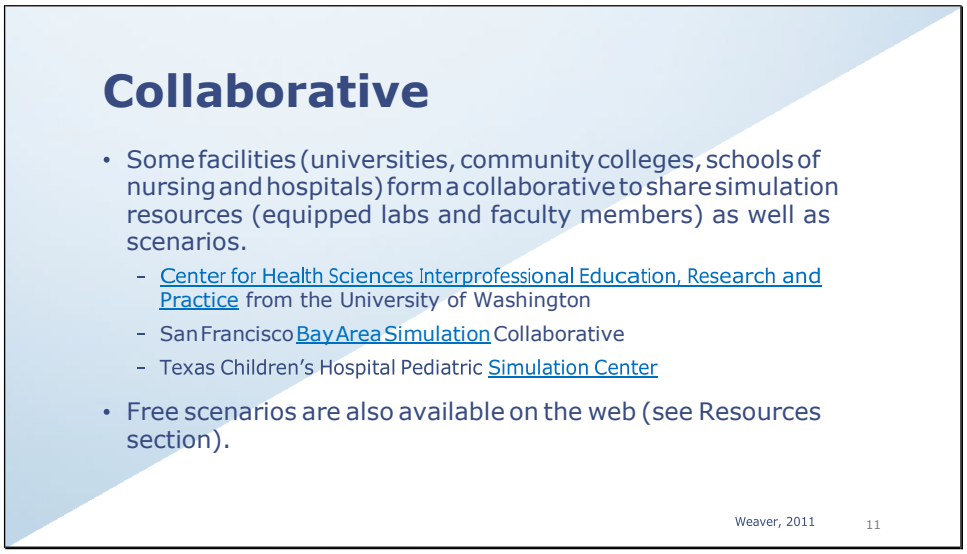
- Students will be able to identify a patient in respiratory distress
- Students will be able to determine appropriate actions for a patient in respiratory distress
- Students will be able to identify when to contact the primary care provider

Problem to solve – how to care for a patient who is in respiratory distress

Props needed would be a chart, oxygen delivery methods, medications appropriate to the scenario, IV access or ability to get IV access, saturation monitor, ABG results, etc.

Resources prior to the scenario might be textbook information, video on oxygen administration or adjuncts, medication cards, etc.

Slide 11

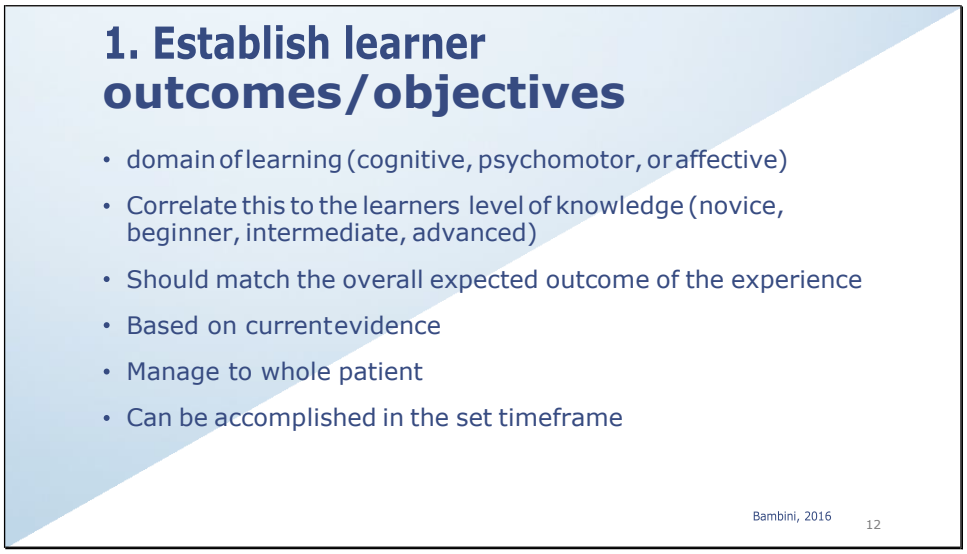


Some of these offer free resources through current grants.

Once the grants expire, the information may not be free any longer or the grant may be extended.

Some of these collaborative endeavors may locate a donor willing to sponsor these resources for a longer period of time. They may also now apply a fee for their use.

Slide 12

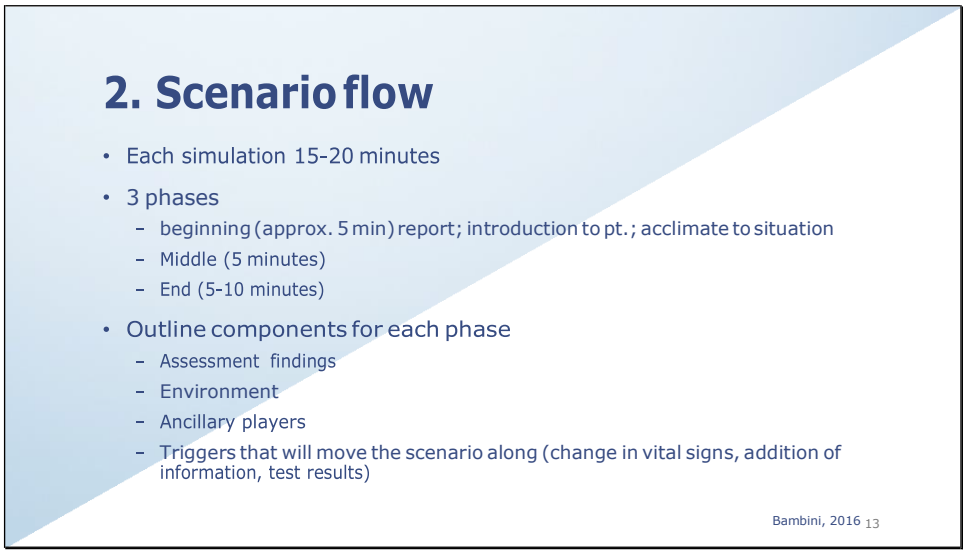


Domain of learning depends on whether it is a skill (psychomotor), an acquisition of skill and knowledge (cognitive and psychomotor), or communication skill (affective)

Bambini (2016) suggests situations that would be good simulated experiences are:

- Failure to recue
- Communication challenges (calling physicians)
- Unsafe patient circumstances
- Team (interprofessional) communications
- Issues that involve risk management (medication error, peer errors, homeless patients)
- New processes or procedures

Slide 13

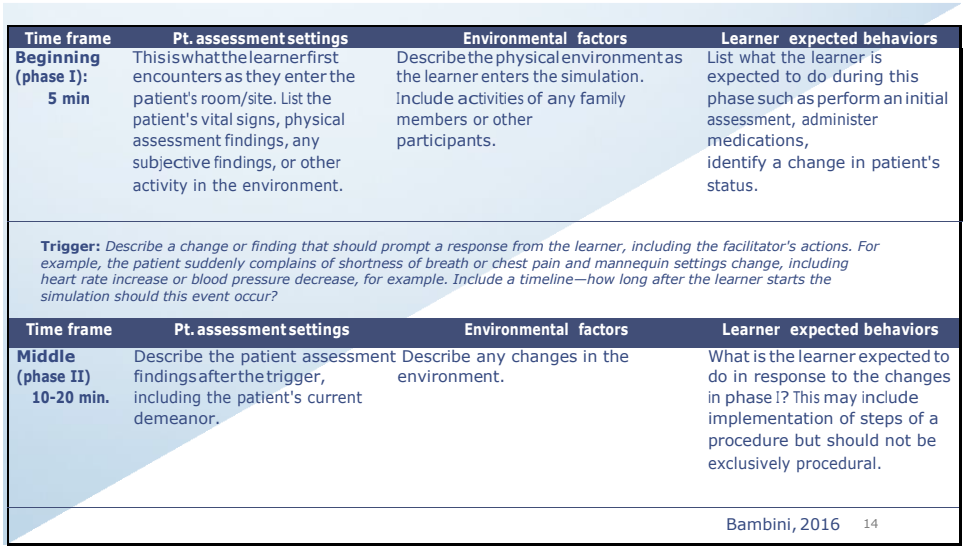


As a novice scenario writer, write each phase separately

An expert in the particular area of the simulation should review the scenario for accuracy and evidence-based practice.

Triggers should be observable and at the educational level of the participants.

Slide 14



Time frame	Pt. assessment settings	Environmental factors	Learner expected behaviors
Beginning (phase I): 5 min	This is what the learner first encounters as they enter the patient's room/site. List the patient's vital signs, physical assessment findings, any subjective findings, or other activity in the environment.	Describe the physical environment as the learner enters the simulation. Include activities of any family members or other participants.	List what the learner is expected to do during this phase such as perform an initial assessment, administer medications, identify a change in patient's status.

Trigger: *Describe a change or finding that should prompt a response from the learner, including the facilitator's actions. For example, the patient suddenly complains of shortness of breath or chest pain and mannequin settings change, including heart rate increase or blood pressure decrease, for example. Include a timeline—how long after the learner starts the simulation should this event occur?*

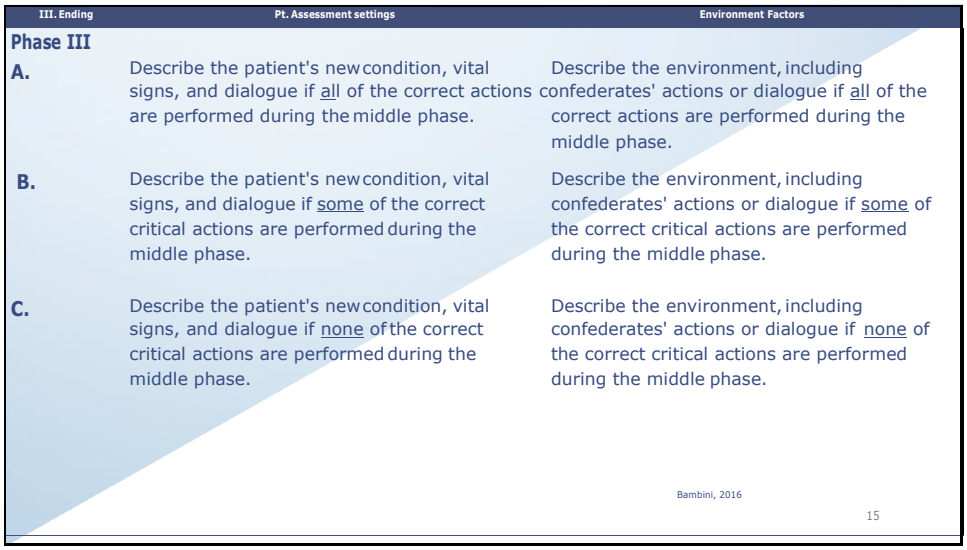
Time frame	Pt. assessment settings	Environmental factors	Learner expected behaviors
Middle (phase II) 10-20 min.	Describe the patient assessment findings after the trigger, including the patient's current demeanor.	Describe any changes in the environment.	What is the learner expected to do in response to the changes in phase I? This may include implementation of steps of a procedure but should not be exclusively procedural.

Bambini, 2016 14

Slides 11 and 12 show how the template explains each phase for the writer.

This slide depicts the beginning and middle, but between them is the trigger or the information or change that moves the scenario to the next "scene".

Slide 15



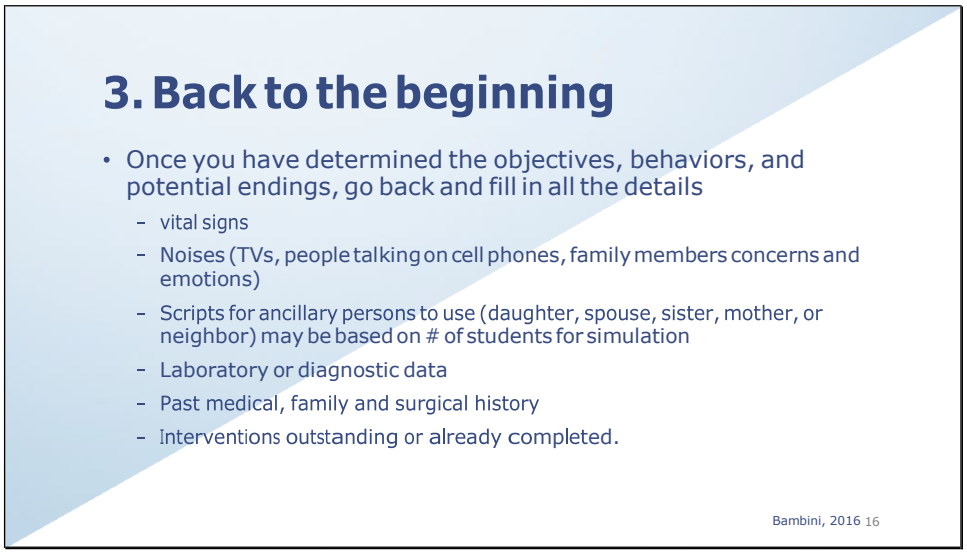
The ending should be done with 3 potential endings, which will vary depending on where your student takes the scenario. There are any number of combinations of interventions your students may choose

Cues should be used to attempt to guide students toward the ending you desire, but students do not always pick up on these cues.

Endings should be developed on the following

- Everything in the scenario is done correctly (high level performing students)
- Some things are done correctly (medium-level performer)
- Most things are not done correctly (low level performer)

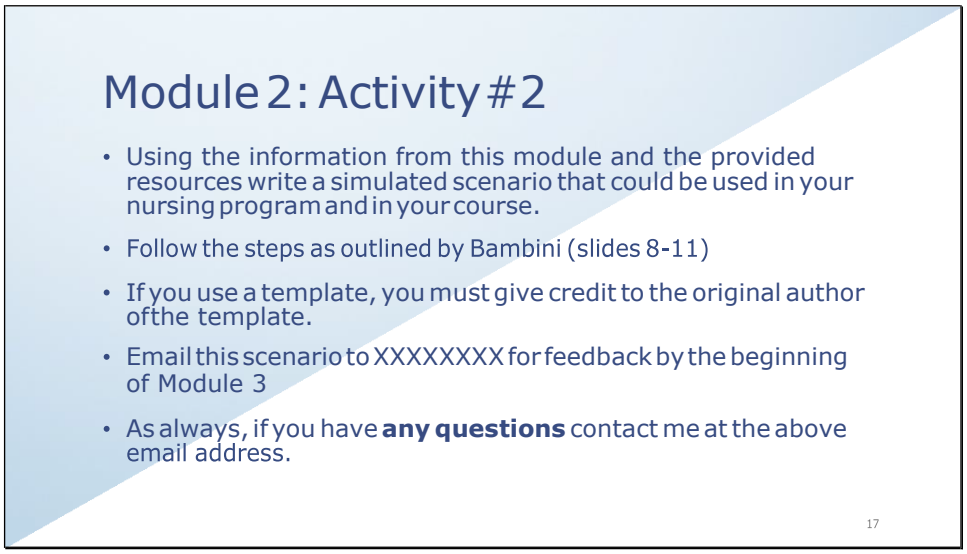
Slide 16



Bambini (2016) suggests roles and partial scripts or enough details to allow performers to ad lib appropriately.

Again have an expert review the scenario.

Slide 17


Module 2: Activity #2
• Using the information from this module and the provided resources write a simulated scenario that could be used in your nursing program and in your course.
• Follow the steps as outlined by Bambini (slides 8-11)
• If you use a template, you must give credit to the original author ofthe template.
• Email this scenario to XXXXXXXX for feedback by the beginning of Module 3
• As always, if you have **any questions** contact me at the above email address.
17

Slide 18

References

- Bambini, D. (2016). Writing a simulation scenario: A step-by-step guide. *Advanced Critical Care Nursing, 27*(1), 62-70.
- Jeffries, P. R., Dreifuerst, K. T., Kardong-Edgren, S., & Hayden, J. (2015). Faculty development when initiating simulation programs: Lessons learned from the national simulation study. *Journal of Nursing Regulation, 5*(4), 17-23
- Kisner, T., & Johnson-Anderson, H. (2010). Simulation on a shoestring budget. *Nursing, 40*(8), 32-35. doi:10.1097/01.NURSE.0000383900.50225.fa
- Meakim, C., Boese, T., Decker, S., Franklin, A. E., Gloe, D., Lioce, L....Borum, J. C.(2013). Standards of best practice: Simulation Standard I: Terminology. *Clinical Simulation in Nursing, 9*(6), S3-S11. doi:10.1016/j.ecns.2013.04.001
- Wilhaus, J. (2016). Simulation Basics: How to conduct a high-fidelity simulation. *Advanced Critical Care*, 27(1), 71-77. doi:10.4037/aacnacc2016569.

Resources for Module 2

Realism and Moulage (Equipment see Module 1)

Healthy Simulation (2014) Moulage. Retrieved from http://healthysimulation.com/moulage/

Kaiser Network (2009). Damazo's "How instructors can suspend disbelief". Retrieved from http://kp.simmedical.com/sites/kaiser/resources/pdf/Kaisermoulage.pdf

Oklahoma Healthcare Workforce (n.d.). Langford: Moulage recipes. Retrieved from http://www.okhealthcareworkforce.com/Conferences/documents/JackieLangford_ArtofMoulage_Recipes.pdf

Thesimtech (n.d.). Moulage. Retrieved from http://thesimtech.com/moulage/

Scenario Development Presentations

Agency for Healthcare Research and Quality (2016). TeamSTEPPS. Retrieved from https://www.ahrq.gov/teamstepps/index.html

INACSL (2011). Howard, Feken & Graham: Scenario Development (presentation). Retrieved on May 14, 2016 from http://www.aacn.nche.edu/webinars/handouts/11.29.11Handout.pdf

Taxonomy and Competencies

Iowa State University (2016). Revised Bloom's taxonomy. Retrieved from http://www.celt.iastate.edu/teaching/effective-teaching-practices/revised-blooms-taxonomy

Quality and Safety Education for Nurses (2014). Competencies. Retrieved from http://qsen.org/competencies/

Vanderbilt University Center for Teaching (2016). Bloom's Taxonomy. Retrieved from https://cft.vanderbilt.edu/guides-sub-pages/blooms-taxonomy/

Scenario development templates

National League of Nursing: Simulation Innovation Resource Center (n.d.). Resources. Retrieved from http://sirc.nln.org/mod/page/view.php?id=843

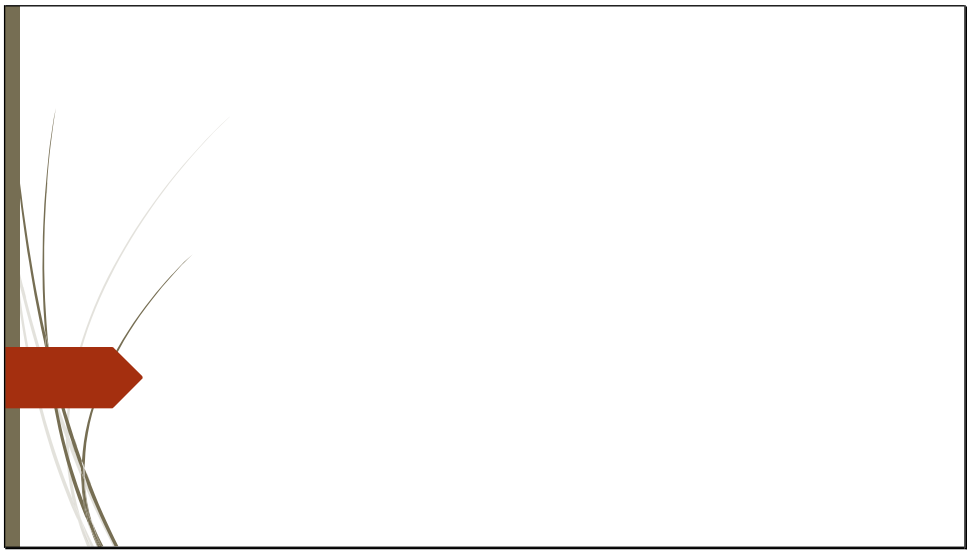
Quality and Safety Education for Nurses (2009). A template for simulation scenario development that incorporates QSEN competencies. Retrieved from http://qsen.org/a-template-for-simulation-scenario-development-that-incorporates-qsen-competencies/

University of Alabama at Birmingham (2014). Template for simulation patient design. Retrieved from https://www.uab.edu/simulation/images/Scenario_Template_GUIDE_COA_logo_ver_01.02_Sept192014.pdf

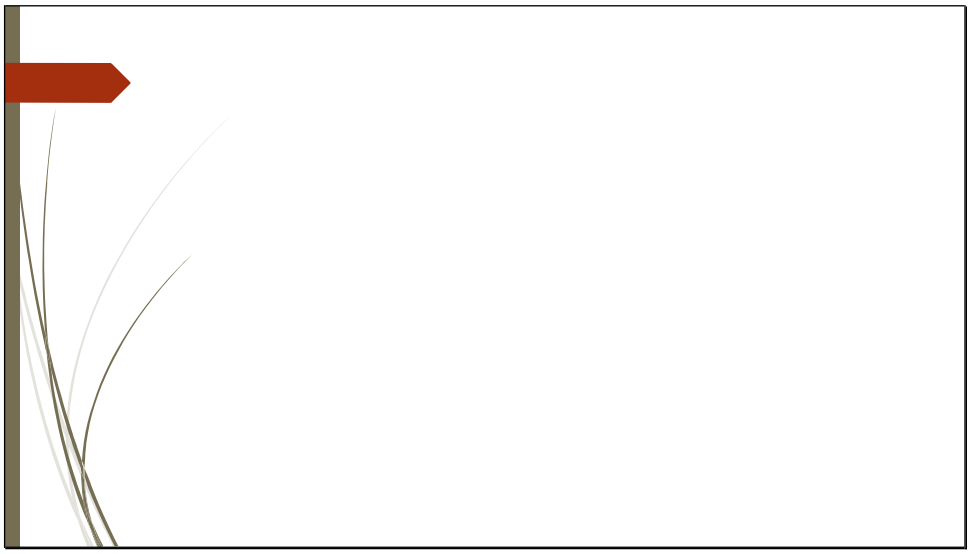
University of Washington School of Nursing (n.d.). Simulation scenario development template. Retrieved from http://collaborate.uw.edu/sites/default/files/files/ScenarioDevelopmentTemplate.pdf

Module 3

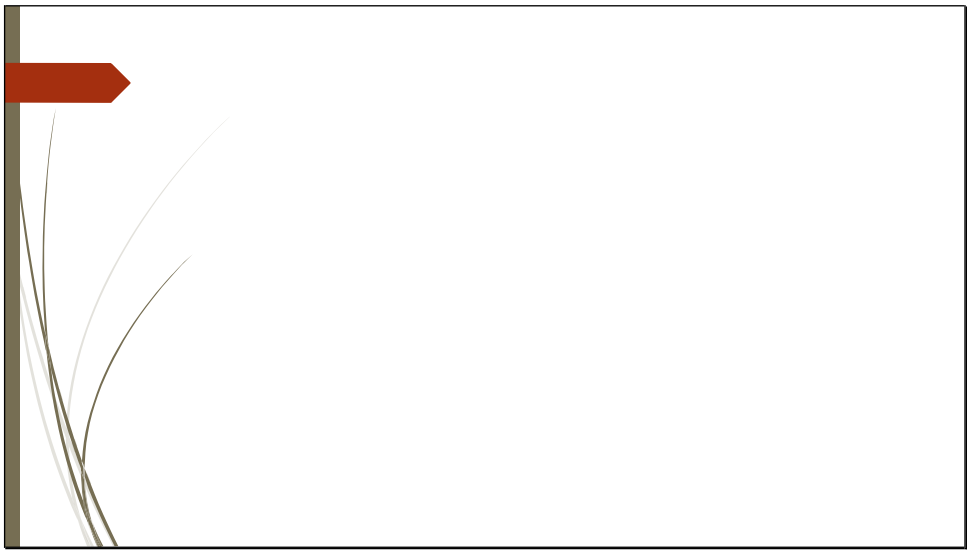
Slide 1



Slide 2



Slide 3



Most simulations can be recorded (audio and video) to be used during debrief.
I know, most people do not like to be recorded. This is simply for learning and everything in the simulated environment is “confidential”. It is not discussed outside the simulation environment and not usually used for “grading” purposes.

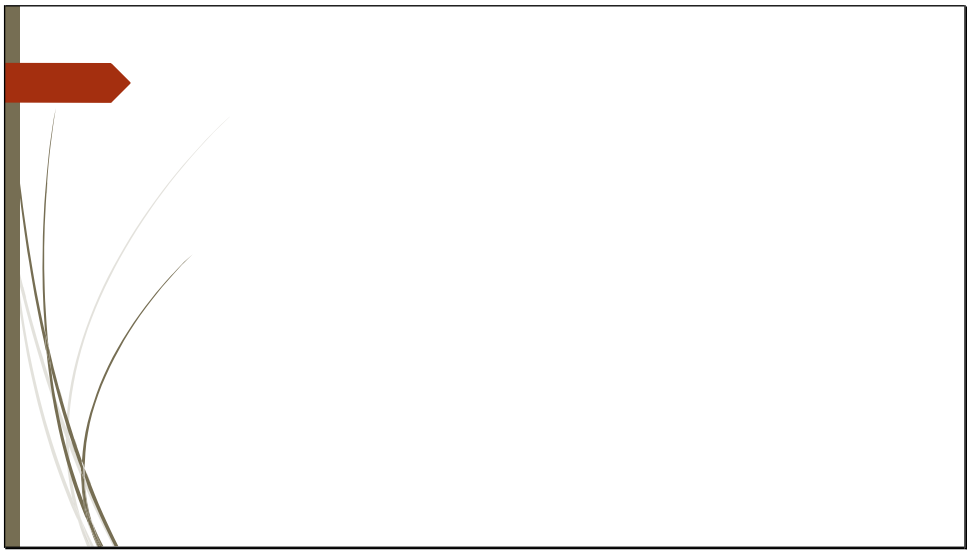
Showing the video can facilitate discussions about:

- What they were thinking at a particular time
- What they might have done differently
- Something that was done exceptionally well

This allows students to reflect back on what they were thinking at specific times or what they were doing.

Occasionally students say “I forgot to do …” or “I’m not sure if I said …”
The learner can verify what they actually did during the viewing of the video.
Information to be clarified or discussed.

Slide 4



Debriefing is a skill like any other, which means it should be practiced and critiqued. The person conducting the debrief should be someone who witnessed the simulation, and has had training in debriefing.

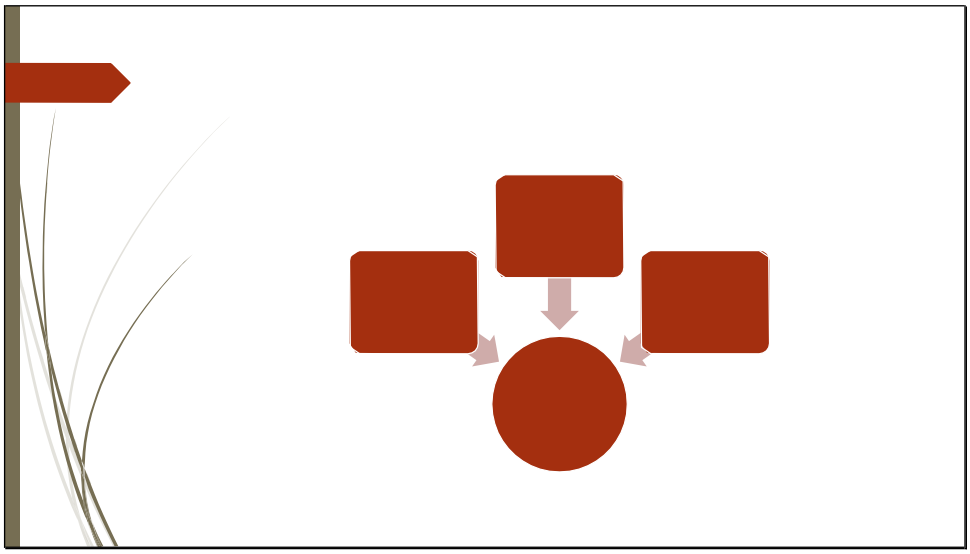
Remind everyone that debrief is a safe area for discussion and that what is discussed in the debrief will not be shared outside the room. Make sure you have a policy to cover confidentiality in the simulation environment as you would in the clinical environment.

There should be evaluations of the simulation experience as it occurs. Some schools have students evaluate the actions of the performing students and this can occur either in the simulation space, or preferably via televised video feed. (collect these and use for determining what needs to be discussed, such as if viewing the video, and the student does not lift the gown to listen to lung or heart sounds, wash hands, identify themselves, etc.)

Faculty can jot down notes as the simulation occurs to remind them of discussion topics.

Discussions should revolve around the simulation objectives written for the experience.

Slide 5



Arafeh, Hansen, and Nichols (2010) identified three phases of the debrief.

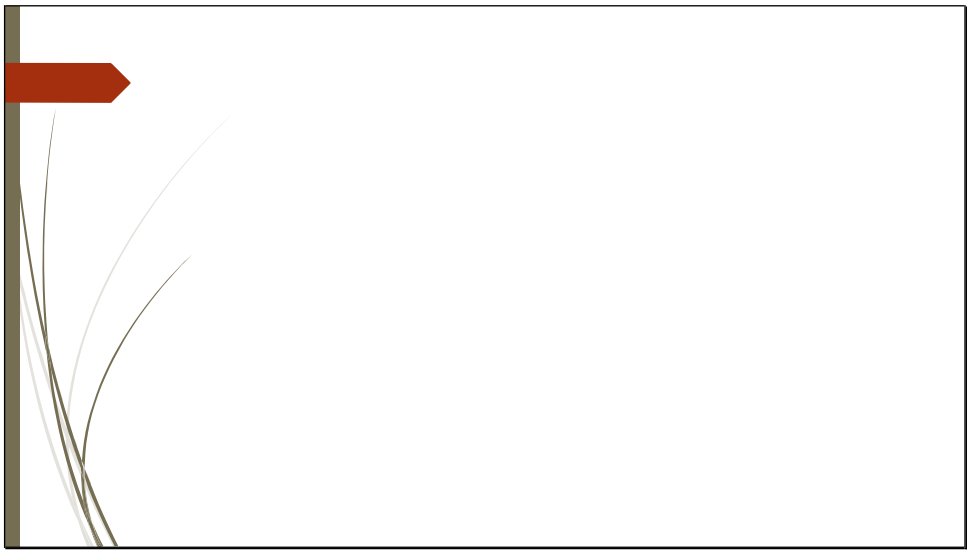
Debrief should begin as soon as possible after completion of the simulation in a room other than the simulation room.

Initially students will have emotional reactions (**reaction phase**) to how they think the simulation went. The facilitator could start with "So, now that we are done, how do you feel about the experience?" If a student feels they did not "perform" as they were expected, have them expand on that. Sometimes the video can help them see that their thoughts about what they did are not accurate, and they may have actually done some of the things they think were note accomplished.

Steer them back to the objectives of the experience "One objective for todays simulation was to identify the patient's nausea and intervene. Did that occur?"
"What were your thoughts at the time you applied the cold washcloth to their head?" This is the **analysis phase**. Some students will have previous experiences that contribute to their actions in this experience.

Take-home points: "How will you apply this new knowledge to your next experience like this? (**Summary phase**)

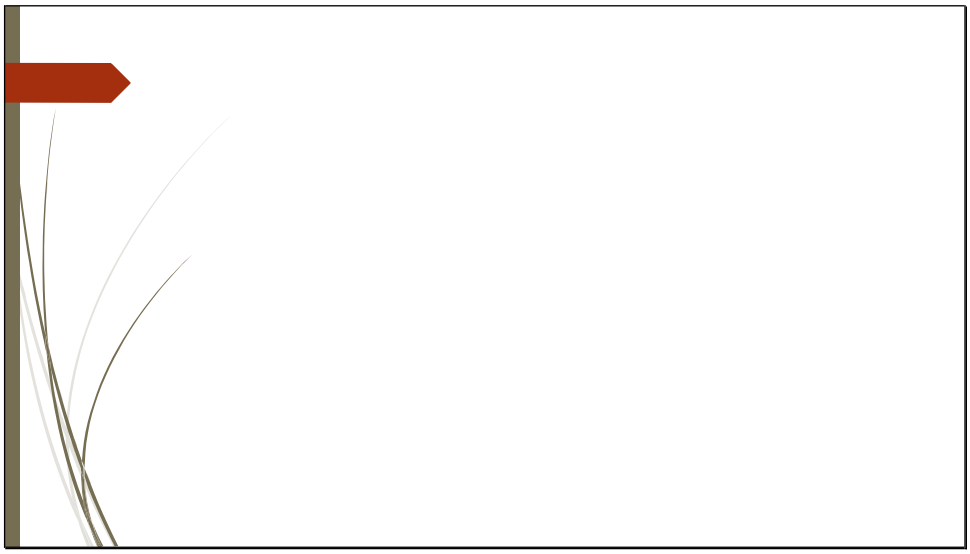
Slide 6



Watch these YouTube videos to get a feel for how debriefings are conducted.

While viewing these videos, answer the questions posed here.

Slide 7

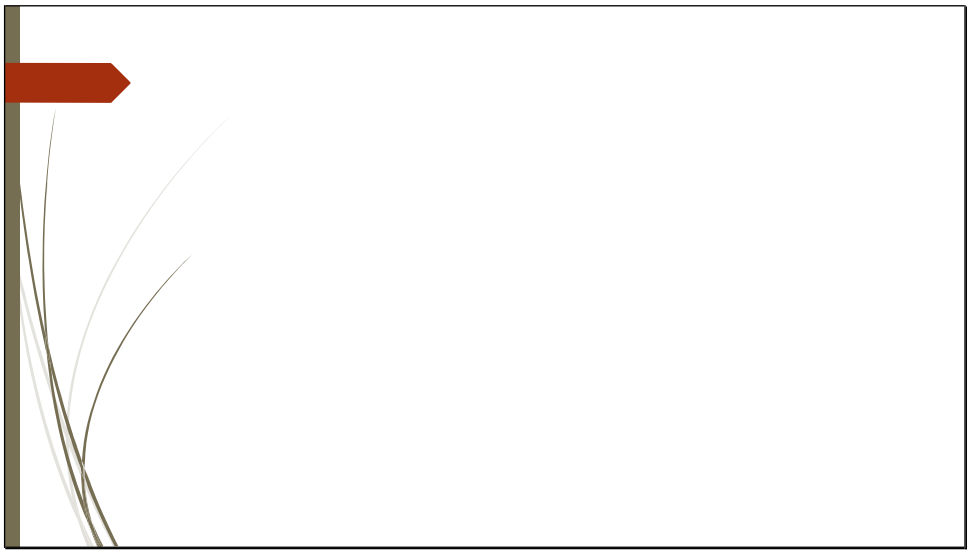


Waznonis (2014) conducted this study as a mixed method design using 219 faculty members of accredited BSN programs from 42 states and the District of Columbia.

Most of the faculty were fairly new academia, facilitating large numbers of debriefings with a lack of evaluation by other faculty and minimal support.

Recommendation is that these debriefers begin regular evaluations to determine effectiveness of their debriefing styles.

Slide 8



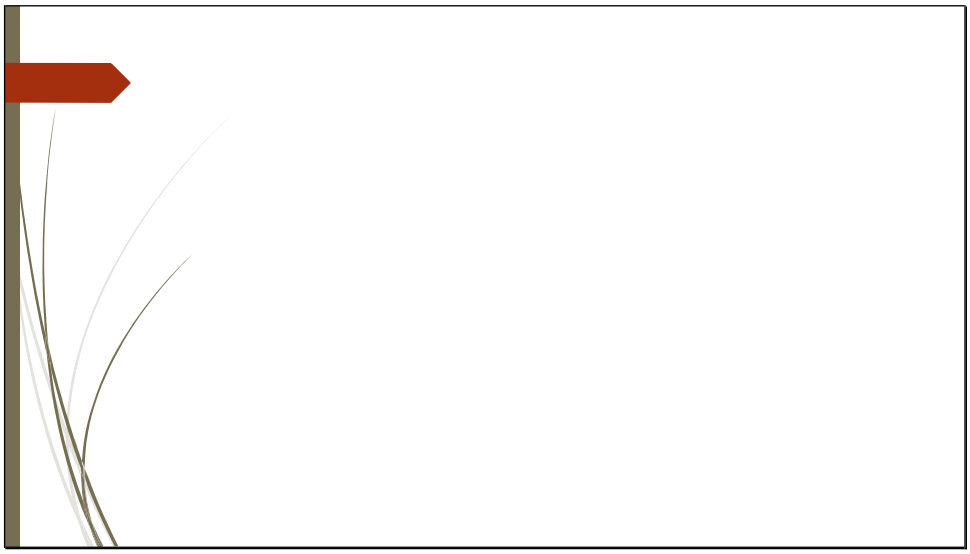
This study by Chronister and Brown (2012) was conducted on a critical care group (*n* = 37) for a simulation of cardiopulmonary arrest.

Some of the limitations of the study were related to the two groups having the same amount of time for debrief even if they also reviewed their video portion. This group may not have had as much time to discuss verbally the simulation.

A test was given after the experience but no points were attached to a course grade and the test was given at the end of the last class times, so it may have been low student effort.

Recommend adding time to debrief if using recorded video review also.

Slide 9



Waznonis (2014) did a **literature review** of methods and evaluation simulated experience debriefing tools.

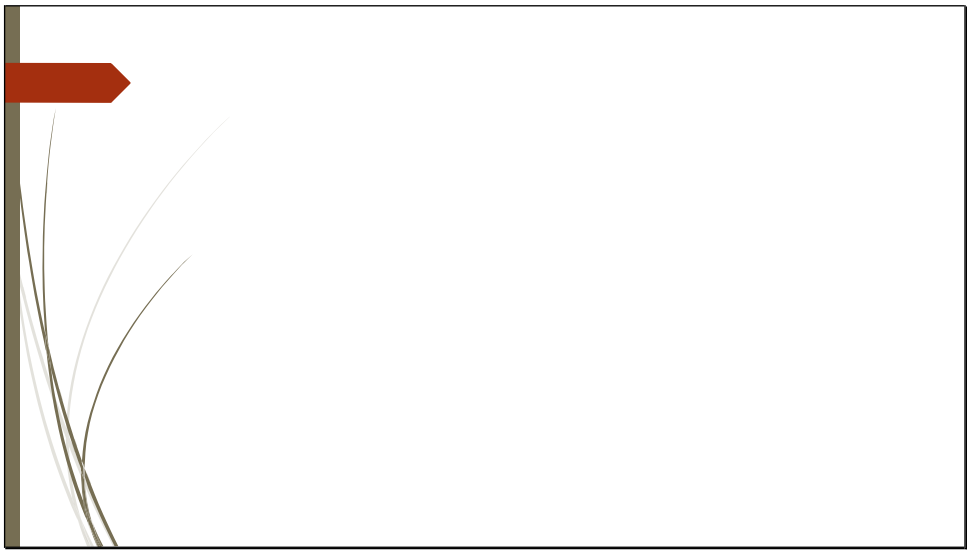
Sample: 22 articles discussed methods and seven more discussed evaluation making a total of 29 articles. Only found seven methods actually developed for debriefing nursing education

Results:
The tools vary on resources available for the evaluator, methods of evaluating the simulations vary on each, each has a different design, and a different use (medical, nursing, or intraprofessional).

Some **elements** discussed in these articles included: length of time for debrief, time relevant to length of sim, the physical environment, faculty experience, faculty roles, student roles, atmosphere, objectives of the debriefing, methods of debriefing, phases of debriefing, approaches to debriefing, means of evaluations, challenges to debriefing

Recommendations:
Evaluate every method used by your faculty before developing one of your own.

Slide 10



Reed (2015) conducted this study with 58 nursing students.

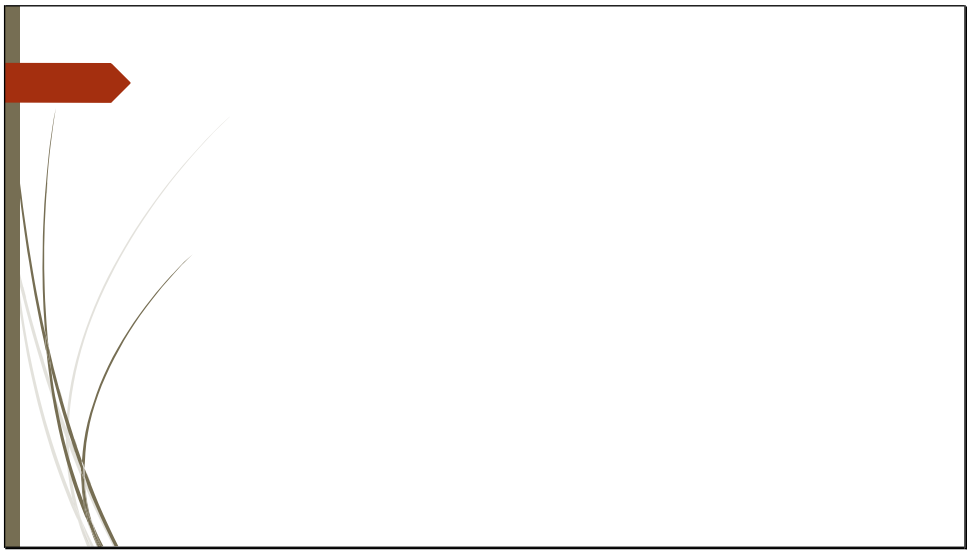
Purpose of study: to add written debriefing to nursing student debriefing experience.

The questions for blogging and journaling were:

- What did you learn during the simulation session?
- What did you think of your performance during the simulation?
- What did you think of the group's performance during the simulation?
- What are your questions concerning the simulation?
- How can what you learned be applied to your future performance?

They were required to respond to one or more of the above questions or to another students post or blog comment.

Slide 11



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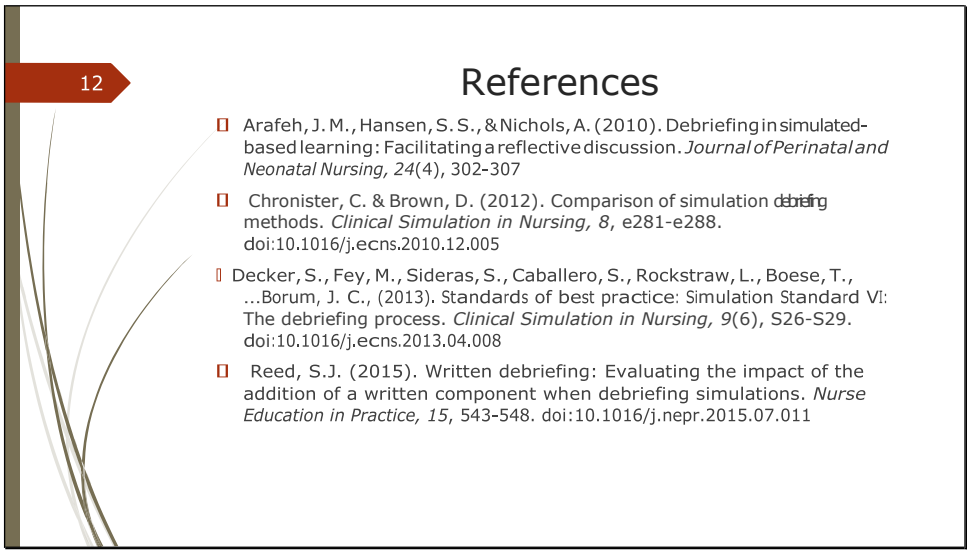
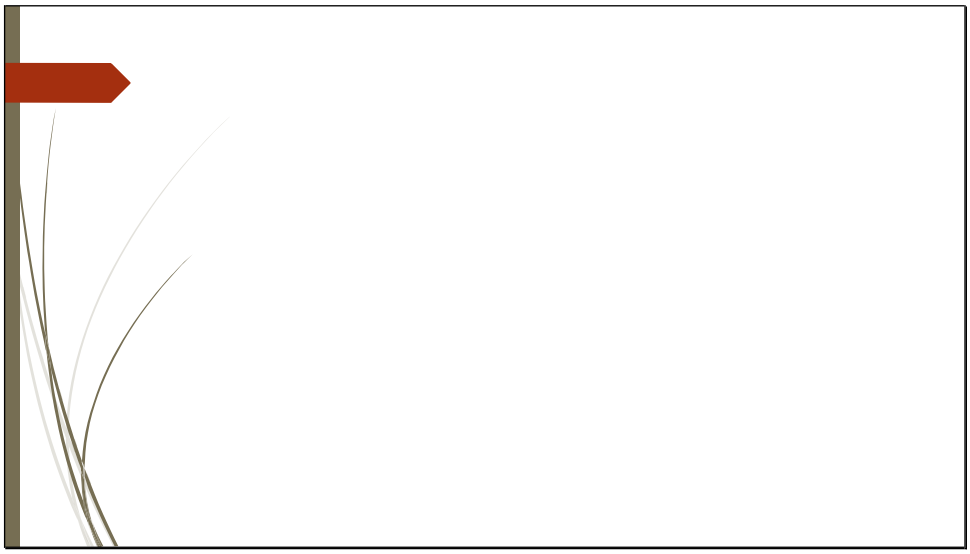

12
References
Arafeh, J. M., Hansen, S. S., & Nichols, A. (2010). Debriefing in simulated-based learning: Facilitating a reflective discussion. Journal of Perinatal and Neonatal Nursing, 24(4), 302-307
Chronister, C. & Brown, D. (2012). Comparison of simulation debriefing methods. Clinical Simulation in Nursing, 8, e281-e288. doi:10.1016/j.ecns.2010.12.005
Decker, S., Fey, M., Sideras, S., Caballero, S., Rockstraw, L., Boese, T., ...Borum, J. C., (2013). Standards of best practice: Simulation Standard VI: The debriefing process. Clinical Simulation in Nursing, 9(6), S26-S29. doi:10.1016/j.ecns.2013.04.008
Reed, S.J. (2015). Written debriefing: Evaluating the impact of the addition of a written component when debriefing simulations. Nurse Education in Practice, 15, 543-548. doi:10.1016/j.nepr.2015.07.011

Slide 13



Resources for Module 3

International Nursing Association for Clinical Simulation and Learning (2016). Standards for best practice: Simulation. Retrieved from http://www.inacsl.org/i4a/pages/index.cfm?pageid=3407

National League for Nursing (2015). Vision Series: Debriefing across the curriculum. Retrieved from http://www.nln.org/docs/default-source/about/nln-vision-series-(position-statements)/nln-vision-debriefing-across-the-curriculum.pdf?sfvrsn=0

Current Debriefing Tools

Allegheny Health Network (Debriefing: Tools and references. Retrieved from https://www.ahn.org/education/star-center/course-catalog/star-courses/debriefing-tools

California Baptist University (2012). Clinical simulation debriefing tool. Retrieved from https://www.calbaptist.edu/files/8114/0742/7327/debriefing_tool.pdf

Harvard Medical, Center for Medical Simulation (2016). Debriefing Assessment for Simulation in Healthcare (DASH). Retrieved from https://harvardmedsim.org/debriefing-assesment-simulation-healthcare.php

National League for Nursing, Simulation Innovative Resource Center (n.d.). Home page. Retrieved from http://sirc.nln.org/

University of Washington, Center for Health Sciences Interprofessional Education, Research, and Practice (2016). Debriefing tools. Retrieved from http://collaborate.uw.edu/tools-and-curricula/debriefing-tools.html

Debriefing videos

Center for Medical Simulation (2014). The role of debriefing in simulated training. Retrieved on June 1, 2016 from https://www.youtube.com/watch?v=ipRhr1lkiP4

STABLEProgram (2013) Introduction to Debriefing 2013. Retrieved on May 18, 2016 from https://www.youtube.com/watch?v=qEnjqG4zV6M

Evaluation of the Simulation Faculty Development Modules

Goals/Objectives	Strongly agree	Agree	Disagree	Strongly Disagree
1. This faculty development met my needs related to learning about simulation.	4	3	2	1
2. This faculty development offering met my needs relative to learning about writing a simulation scenario.	4	3	2	1
3. This faculty development offering met my needs relative to learning about debriefing a simulation experience.	4	3	2	1
4. Module 1 provided resources for development of a plan to begin a simulation program in a nursing curriculum.	4	3	2	1
5. Module 1 provided resources to ascertain necessary equipment for the plan of a simulation lab in my current program.	4	3	2	1
6. Module 1 provided resources to approximate some costs for the plan of a simulation lab.	4	3	2	1
7. Module 1 provided an opportunity to write a financial plan for construction of a simulation lab with feedback from facilitator.	4	3	2	1
8. Module 2 provided information about necessary components for the development of a high-fidelity simulated experience.	4	3	2	1
9. Module 2 provided resources to facilitate comparison of online templates for use in high-fidelity simulation scenario writing.	4	3	2	1
10. Module 2 provided information about ways of “suspending reality” in simulated experiences and scenarios.	4	3	2	1
11. Module 2 provided the opportunity to write a simulated experience scenario that could be used in your course with facilitator feedback.	4	3	2	1
12. Module 3 provided a definition for the	4	3	2	1

act of debriefing students after simulated experiences.				
13. Module 3 provided results of current research related to debriefing techniques after a simulated experience.	4	3	2	1
14. Module 3 enhanced my knowledge related to the reason debrief is considered the “most important” part of simulation.	4	3	2	1
15. Module 3 provided an opportunity to develop an outline for debriefing of the scenario written in Module 2 with facilitator feedback.	4	3	2	1

Please provide answers to the following open-ended areas:

Benefits to your practice:

Concerns about course content:

Concerns about course design:

Other concerns/challenges/suggestions:

Appendix B: Simulated Experiences in the 18-Month Curriculum

Summer 1 (50–51 students) - No simulation used in first summer courses (Health Assessment, Informatics, and Professional Nursing).

Fall 1 (50 students)	**Spring (50 students)**	**Summer 2 (45 – 48 students)**	**Fall 2 (45 – 48 students)**
Pharmacology I* *Simulator taken to classroom*	**Adult I (1st 8 weeks)**	**Manager of Care**	**Advanced Health Care**** *Respiratory failure simulation –* *This experience is offered to 20 – 25 students twice in the semester*
Fundamentals *Low fidelity, task trainers*	**Adult II* (2nd 8 weeks)** *Simulated Blood transfusion reaction*	**Maternal and Newborn Care*** *Delivery done in classroom* *Post-partum hemorrhage done in the lab*	**Pediatric Nursing****
Pathophysiology	**Evidence Based Practice**	**Trends and Issues**	**Gerontology** *Low fidelity Simulation*
Psychosocial Aspects of Client Care *Alcoholic patient simulation*	**Pharmacology II**	**Community Health Care**	**Role Transition**

(*) These courses offer simulated experiences.
(**) These courses run for 8 weeks and are alternated, half the class in each course then they switch for the second 8 weeks.

Appendix C: Defined Pieces of the Structure → Process → Outcome Model of Quality as Related to Nursing Education and High-Fidelity Simulation

Structure	• **Faculty** (full-time, part-time, adjunct, education, experience with simulation) • **Program** (BSN, RN-BSN, RN-MSN, educational pedagogy) • **Barriers** (funds, building space, lab space, time allocation to simulation, faculty training (previous and current), types of simulators, faculty experience with simulation) • **Resources** (funds for the lab and for simulators (such as grant monies, tuition, fees, private or public endowments, donors), buildings and space, information technology (IT), IT personnel, educational delivery platforms (Blackboard, E-college, Angel, Web CT, etc.), number & types of simulators, simulation specialist/coordinators (designated as part or all of their workload) • **Incentives** (time allowance, extra pay, faculty workload allocation, number of simulators, recognition (administrative, colleagues, or community)
Process	• **Governance** (administration, faculty, College/University, unionized/non-union, decision-making body) • **Support** (information technology, volunteers from community, warranties on simulators) • **Curriculum** (18 month, 2 year, 4 year, Accelerated option, Concept-based, Simulation assisted courses, Simulation used as clinical hours, Simulation used as an adjunct to clinical hours
Outcome	• **Students** (Job placements, Employer satisfaction, Course evaluations, Simulated experience evaluations, Standardized testing scores, Course testing scores, Clinical performance, Critical thinking • **Evaluation** (Accreditors, NCLEX pass rates, Student learning outcomes, Employer satisfaction, Student evaluation of HFS, Student evaluation of course design, Clinical objectives, Program objectives, Debriefing, Standardized testing scores

Appendix D: Permission to Use USTI

Correspondence between myself and the originator of the USTI tool, Dr. Teri Thompson

On Sat, Mar 30, 2013 at 1:50 PM, Linda Howell XXXXXX wrote:
Dear Dr. Thompson,

I am an educational doctoral student at Walden University, working on my prospectus, and recently ran across your dissertation in ProQuest. My topic is high-fidelity simulation, looking at the faculty perspective related to integrating high-fidelity simulation into the baccalaureate curriculum. I have been searching for a tool and while reading your study realized the USTI Survey appears to be a very good fit for my study with a few minor changes.

The purpose of contacting you is to inquire about permission to use your survey and to provide you with information about the study when it is finished. It was quite a surprise, to find that you are located in the XXXXXXXX area as I also live in the area.

Thank you for your consideration and I look forward to hearing from you.

Sincerely,
Linda Howell MSN, RN

Teri L Thompson XXXXXXXX 3/31/13

to me

Linda,
You do have my permission to use the USTI. Please keep me informed regarding how you change it as it is copy righted. I am most interested in your research as well. I did live in XXXXXXXX for many years, and am a native of XXXXXXXX, but have relocated to XXXXXXXX where I grew up to be closer to my parents. I do get back to XXXXXXXX frequently - let me know if you should need anything and we can arrange to meet if need be.

Teri

On Sat, Mar 30, 2013 at 1:50 PM, Linda Howell XXXXXXXX wrote: 11/11/13

Linda Howell XXXXXXXX

to Teri

Dr. Teri Thompson,

I hope this finds you well. I am currently getting ready to submit my proposal, and I have made some changes to the USTI to quantify some of the data in order to be able to use it for my study.

I am sending you some revisions I made to the tool with the hope you will be OK with those changes and still give permission to use it for my study.

Thank you for your assistance and provide any feedback you deem necessary.

Lin Howell

Teri L Thompson XXXXXXXX 11/11/13

to me

Linda,
I am still okay with you using the survey - and with the changes I saw - the problem comes in that you won't have any reliability or validity on the changes. That needs to be clearly stated as an issue with the study. Please send me the results and let me ready your dissertation. I am most interested. Hang in there I know what it is like to be where you are at.

Teri

Appendix E: E-mail Questionnaire

Demographic Information:

1. Please choose the age range that best describes you.
   ____20–35
   ____36–45
   ____46–55
   ____Older than 56

2. Gender: Male_____Female _____

3. Number of years teaching didactic_____Number of years teaching in the clinical setting_____Number of years working with simulation _____.

4. Educational level:
   a. MSN
   b. Doctorate
      i. PhD____Nursing____Other field_____
      ii. EdD _____
      iii. DNP _____

5. Teaching Practice:
   a. Baccalaureate program _____
   b. Associate Degree Program _____

6. Courses using HFS:
   ____Maternal/OB
   _____Gerontology
   _____Med/Surg
   _____Psychiatric/Mental Health
   _____Community Health
   _____Leadership
   _____Pediatrics
   _____Foundations of Nursing/Fundamentals
   _____Critical Care
   _____Other

I am interested in learning about your experiences with using simulation in your nursing program. Please answer the following questions with as much detail as possible. This will help me understand the unique challenges faced in integrating simulation into your nursing program.

1. Do you think your faculty have successfully integrated simulation into their curriculum? How would you define a successful integration of simulation into a baccalaureate nursing curriculum? Please give a rationale for your answer. (Research Question (RQ) 1, 2,3,4)

2. I am interested in what barriers you have encountered in the process of using high fidelity simulation (HFS). Can you tell me about a specific incident that stands out in your mind where you found a way to move past a barrier? Describe it in detail, including why you made the decisions that you did to progress past the barrier. (RQ 1,2)

3. I am interested in what incentives you have encountered in the process of using HFS. Can you tell me about a specific incident that stands out in your mind where you thought "Now this really makes me want to use HFS!" Describe in detail what those incentives were and how they advanced the use of HFS in your curriculum. (RQ 1, 2, 3, 4)

4. Which of the following student outcome factors have you seen improve since integrating HFS into your baccalaureate program? Please check all that apply. (RQ 2, 3, 4)

    ____Job placements
    ____Employer satisfaction
    ____Course evaluations
    ____Simulated experience evaluations
    ____Standardized testing scores
    ____Course testing scores
    ____Clinical performance
    ____Critical thinking

5. Which of the following program outcome factors have you seen improve since integrating HFS into your baccalaureate program? Please check all that apply. (RQ 2, 3, 4)

    ____NCLEX pass rates
    ____Student learning outcomes
    ____Employer satisfaction
    ____Student evaluation of HFS

____Student evaluation of course design
____Clinical objectives
____Program objectives
____Debriefing
____Standardized testing scores

6. I am interested in your personal story of working with simulation. Please describe your experience in implementing HFS into your program. Include details about how you first felt about the task, what concerns you had, what made it easier or harder, and how you feel about the use of HFS in your program now. You might start out your story with: *When I think back on the first time I learned that we would use simulation in our program….* (RQ 1, 2, 3, 4,)

Before you submit your responses, please respond to the following:

I agree that I have read over my responses to the questions and they accurately reflect my thoughts.