5-2012

Responses to a Faculty Development Workshop on Simulation

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Systems Change Project
Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Nursing Practice

St. Catherine University
St. Paul, Minnesota

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May 2012

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This is to certify that I have examined this
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And have found that it is complete and satisfactory in all respects,
and that any and all revisions required by
the final examining committee have been made.

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Acknowledgements

I want to acknowledge the following people for their help on this project.

Roberta Hunt, for her thoughtful feedback on this paper and for her unending words of encouragement. You truly inspire me.

Susan Forneris, for seeing the whole of the project and articulating so clearly much valuable advice. Your help allowed me to see the forest when I was wandering among the trees.

And especially Matthew Byrne, my advisor, for his insightful and knowledgeable comments that gave direction to this project. Also for his continuous attention to my progress and his ongoing and encouraging communication which provided me with unfailing motivation. He was a wonderful partner for this project.

Abstract

Mistakes in the healthcare system are occurring at an alarming rate and most nurse managers find that new graduates are not prepared to deal with the complex patient situations they encounter in the work setting. It is imperative that nursing education find ways to increase the quality of their graduates. One method to improve nursing education is with the use of simulation. However, nursing faculty are ill-prepared to use simulation competently and effectively. The literature lacks any research that looks at the impact of specific methodologies used in the education of faculty in the use of simulation. The study, *Responses to a Faculty Development Workshop on Simulation*, revealed that a workshop can positively influence faculty knowledge, skill, and attitudes related to simulation. The two day workshop was developed using adult learning principles imbedded in constructivist and experiential learning theories. Following the workshop, a survey explored faculty perceptions of the teaching/learning components in the workshop. The results showed an increase in faculty knowledge and skill, and improved attitude regarding simulation. Increasing the knowledge and skill and improving the attitude of faculty related to the use of simulation will facilitate the development of graduates that provide competent and safe care in clinical practice.

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Chapter One

Background and Significance

Healthcare in our country is in crisis. Mistakes in the healthcare system occur at an alarming rate. According to Bandali, Parker, Mummery, and Preece (2008), “between 44,000 and 98,000 people in the US die each year as a result of medical error” and this “exceeds those that are attributed to motor vehicle accidents, breast cancer, and AIDS” (p. 179). Researchers are pointing to nursing education as one cause of the appalling statistics. According to the Nursing Executive Center of the Advisory Board Company research as reported in Berkow, Virkstis, Stewart, & Conway (2009), a discrepancy exists between how nurse educators and hospital nurse managers see the abilities of the new graduate nurse. “Ninety percent of academic leaders believe their nursing students are fully prepared to provide safe and effective care, compared with only 10% of hospital and health system nurse executives” (Berkow, et al., p.17). In contrast, most nurse managers (90%) found that new graduates were not prepared to deal with the complex patient situations they encountered in the work setting (Benner, Sutphen, Leonard, & Day, 2010; Berkow et al., 2008). The nursing profession has the ability to reverse this situation by radically transforming the way it educates its future nurses (Benner, et al., 2010).

The Institute of Medicine (IOM, 2003) listed five core competencies for organizations that educate healthcare professionals in *Health Professions Education: A Bridge to Quality*. The IOM implored educators to ensure that students…develop…proficiency in the five core areas, including “Provide patient-centered care”, “Work in interdisciplinary teams”, “Employ evidence-based practice”, “Apply quality improvement”, and “Use informatics”. As the IOM clearly indicated, there is an urgent need to improve the practice of healthcare professionals and nursing education can play a pivotal role. Finkelman and Kenner (2009) discussed the IOM recommendations and their implications for nursing education saying, “Education of health professionals is viewed as a bridge to quality care” (p.24). The American Association of Colleges of Nursing, with support from the Robert Wood Johnson Foundation, answered the charge to better prepare nurses for practice by developing Quality and Safety Education in Nursing (QSEN) with the goal to equip nurses with the knowledge, skills, and attitudes (KSAs) necessary to continuously deliver quality and safe patient care (Cronenwett, et al., 2007).

In the landmark report of nursing research by the Carnegie Foundation for the Advancement of Teaching, Benner et al. (2010) called for a radical change in the way we educate nurses. They pointed to the gap between the expectations of practice and the educational preparation of nurses. Among numerous recommendations, Benner et al. (2010) advocated using “situated learning” (p.41) with an integration of classroom and clinical teaching. Placing learning in context through the use of unfolding case studies, role play, or simulation enables the student to make the necessary leap between abstract knowledge and the application of that knowledge into practice. The step of application is underemphasized in current education resulting in graduates who underperform in situations that require complex clinical reasoning. Students need guidance to develop clinical imagination and the ability to use their knowledge to determine what is salient in a patient situation. Nursing educators can better prepare nurses by initiating an “ongoing dialogue between information and practice” (Benner et al., 2010, p.14) and developing interactive strategies that will facilitate students to construct and use knowledge.

Educators have an obligation to patients, society, and the nursing profession to guarantee that graduates are competent to provide safe and effective patient care. Consistent with that responsibility, the department of nursing at St. Catherine University has a goal of shifting from one-dimensional pedagogies to active learning strategies involving direct application of concepts to high fidelity contexts. Simulation is being integrated throughout the nursing curriculum as part of this change.

Simulation as it is used in healthcare education is defined as a situation that "replicate[s] some or nearly all of the essential aspects of a clinical situation so that the situation may be more readily understood and managed when it occurs for real in clinical practice" (Morton, 1995, p. 76). It allows for a safe environment in which the student can perform in the role of the nurse with no danger of harming the patient, and can provide situations that the student is unlikely to encounter in her limited time in a clinical setting.

The nursing programs at St. Catherine University are situated in the Henrietta Schmoll School of Health (HSSOH). The mission of the Henrietta Schmoll School of Health supported the development of this project. It stated that "the School is distinguished by an emphasis on relationship-centered care, [and] socially responsible leadership" (St. Catherine University, 2012, School of Health, Mission, para. 2). It followed that an interactive curriculum involving the student in relationship with others was a logical means to educate students "to lead and influence" (St. Catherine University, 2012, Mission, para.1).

A consultation to assess readiness to expand simulation in the HSSOH was conducted in the spring of 2009. At this time, simulation was minimally employed in the school of health with nursing the primary user. There was varied interest in the modality among departments assessed, although support existed at the executive level. The consultant had several recommendations to facilitate simulation implementation in the school of health, including the expansion and development of faculty users. A specific recommendation was to present "simulation as a topic for summer faculty development activities" (Driggers, 2009, p.13).

The study described in this paper involved the development and evaluation of a two-day faculty workshop on simulation offered at St. Catherine University. A descriptive study was conducted to determine if the knowledge, skills and attitudes pertaining to simulation were changed after participation in the faculty development workshop. The workshop had three main faculty objectives that were to be accomplished, increased knowledge about simulation, increased skill in using simulation, and improved attitudes regarding simulation.

The research questions asked in the study were:

1. Was faculty knowledge about simulation increased after participating in a simulation workshop?
2. Was faculty skill in facilitating a simulation increased after participating in a simulation workshop?
3. Were faculty attitudes regarding simulation improved after participating in simulation workshop?

Congruency with Organization

Concurrently with the initiation of the project, each of the nursing programs at St. Catherine University was undergoing major changes. A paradigm shift was occurring as new courses were being developed, new frameworks were created, and the curricular focus changed from faculty-lead to be more interactive and learner-centered. It was an ideal time to expand the use of simulation throughout the curriculum. The workshop conducted was intraprofessional, including participants from the three nursing programs in the University.

Chapter Two

Ethical Framework

The ethical basis for the project was guided by the American Nurses Association's *Code of Ethics* and the principles of Catholic Social Teaching. The *Code of Ethics for Nurses with Interpretive Statements* (Fowler, 2008) contained several provisions that address the faculty/student relationship. Provision 1.1 required that the nurse practice with "respect for human dignity" and an aspect of this included that nurses, "take into account the needs and values of all persons in all professional relationships" (Fowler, 2001, p.147). Provision 1.1 included the needs of the nursing student within the professional dyad of faculty and student. Provision 3 stated that, "The nurse promotes, advocates for, and strives to protect the health, safety, and rights of the patient" (p.152); and within it, Provision 3.4 specifically addressed nurse educators with this statement, "Nurse educators have a responsibility to ensure that basic competencies are achieved…prior to entry of an individual into practice" (p.153). In Provision 7.2, "The nurse educator is responsible for promoting and maintaining optimum standards of both nursing education and nursing practice …where planned learning activities occur…[and] must also ensure that only those students who possess the knowledge, skills, and competencies that are essential to nursing graduate from their nursing programs" (p.164). Nursing educators have a moral imperative to ensure that their students are able to practice safely and competently when they graduate.

St. Catherine University adheres to the principles of Catholic Social Teaching and social justice. Respect for human dignity is the ethical basis for all tenets of Catholic social teaching (Kalb, 2009). Nurse educators must respect and provide for the dignity of patients and students. Students have a variety of individual learning styles (Kolb, 1984), and it would constitute an injustice if an educational program provided learning experiences that informed only some students. Current student populations include many visual learners who need concrete rather than abstract examples. They require guidance to see the larger concepts inherent in an example and how to apply the concepts in other situations. Some students come to nursing with an insufficiency of previous educational opportunities oftentimes related to economic or cultural differences. We respect the dignity of all students when we provide learning opportunities that speak to a variety of learning styles and needs. Simulation assists students to move from a concrete situation (the interactive scenario) to an understanding of the abstract concepts (the reflective debriefing), which is a needed cognitive step to apply the learning in future situations. Simulation benefits all participating students in that it provides activities that consider many learning styles and thus provides social justice in the educational environment.

Theoretical Framework

The gap between education and practice, between the “know what” and the “know how” (Brown, Collins, & Duguid, 1989, p.32) is likely a result of the structure of the current educational system. Nursing programs are involved in teaching concepts; however, simply having knowledge of a concept is like having a tool. Brown et al. (1989) stated that only the learners who “use tools actively rather than just acquir[ing] them…build an increasingly rich implicit understanding of the world in which they use the tools and of the tools themselves” (p. 33). When the design of the educational experience includes opportunities to use the concept, the student is able to incorporate the concept into practice.

Brown described constructivist learning as an epistemological theory that contends learners create or build knowledge from a social interaction between their experiences and their current ideas and beliefs. The concept of constructivism, originally articulated by John Dewey, has been adapted by many educational theorists. Constructivist learning theory is consistent with andragogy and both advocate self-directed, active learning (Peters, 2000). Peters (2000) described how the educator uses this theory when she said, “A constructivist teacher is one who designs learning experiences that are active, where the learners are ‘doing’, reflecting on...and building on previous learning experiences to construct new knowledge” (p. 167). Simulation is supported by the social constructivist education literature. Constructivist knowledge development occurs in simulation as the student comes with knowledge gleaned from formal and informal learning, draws upon that knowledge when thinking through the scenario, and then reflects on the situation during the debriefing, resulting in new knowledge.

Jean Lave (1991) explained in her theory of situated cognition that learning is a function of the activity, context, and culture in which it takes place (Lave & Wenger, 1991). She proposed that the learning of concepts was more effective when it occurred in context. When concepts were taught as abstractions with no attachment to an “authentic” situation, the ability of the student to acquire knowledge was hindered (Brown, et al., 1989, p. 34). During a simulation, the student internalizes the experience as a cognitive model that can be used in a similar situation in the future. Lave (1991) believed that reflection was essential for learning to occur. And debriefing, which is an integral part of simulation, provides guided reflection.

Batson (2011) spoke of Lave’s theory of situated cognition and stated that if “concepts are presented essentially in a vacuum, [the] students then may have difficulty applying the concepts in the world” (p. 110). He recommended that education “re-design a system based on situated learning, a theory that places student *experience* at the center of learning designs” (p.109).

Kolb's theory of experiential learning also supported the use of simulation and debriefing as an effective learning strategy. Kolb (1984) stated that "learning is the process whereby knowledge is created through the transformation of experience" (p. 38). Participation in a simulation scenario provides the experience, and debriefing facilitates the learner's ability to transform thinking based on a newly acquired understanding. Kolb (1984) described a learning cycle that has four stages and learning styles that relate to each stage. The stages of learning are concrete experience, reflective observation, abstract conceptualization, and active experimentation; the styles of learning are accommodating, diverging, converging and assimilating. The learner progresses through all stages but is more likely to learn best in the stages that correspond to the student's personal learning style. Therefore it is important that educators provide a variety of learning experiences that address all learning styles represented by their students. Tanner (2006) said that simulation considered what the nurse brings to the situation, allowed for a variety of reasoning patterns, and recognized the necessity of reflection, both during and after intervention. The result is enhanced clinical reasoning and decision-making for all learning styles.

Lave's theory of situated cognition and Kolb's experiential theory were based on constructivism and require the learner to experience and then reflect for learning to occur. Kolb (as cited in Billings and Halstead, 2009) states that "the experiential learning cycle is a continuous process in which...individuals have a concrete experience, they reflect on that experience (reflective observation), they derive meaning (abstract conceptualization) from the experience, and they try out or apply (active experimentation) the meaning they've created" (p.323). This perfectly describes the process of simulation. The students participate in a scenario or experience, and then in the debriefing reflect on the actions and thinking that occurred in the scenario. From the reflection and discussion students determine their own meaning of what they experienced, and then they project that forward as they consider how their insights can apply in practice.

The theories of constructivism, situated cognition, and experiential learning were also utilized to shape the content and structure of the faculty workshop. The goal of the workshop was for faculty to learn more about simulation and these theories explain how learning best occurs. Thus, a significant portion of the workshop required faculty to immerse themselves in the experience of a simulation.

Literature Review

Simulation.

The literature review included studies that defined and evaluated simulation. Articles on nursing faculty development were also explored.

Simulation as it is used in healthcare education is defined as a situation that "replicate[s] some or nearly all of the essential aspects of a clinical situation so that the situation may be more readily understood and managed when it occurs for real in clinical practice" (Morton, 1995, p.76). The simulated "clinical scenario provides the context for the simulation" (The INACSL Board of Directors, 2011, p. 54) and resembles an actual clinical situation as much as possible. Simulations in some form have been employed in nursing education for decades. Today's simulations have an increased fidelity compared to those previously used. That is, they replicate more closely the real world, including context and complexity, which provides the realistic context imperative in Lave's situated learning theory. An essential component of simulation is the debriefing, where students reflect on the experience with faculty facilitators. Simulations are becoming excellent learning tools for students in healthcare education, enabling students to apply theory to practice.

Waldner and Olson (2007) discussed theoretical frameworks that support simulation and found that Kolb's experiential learning theory provided a base for the use of simulation in learning. Simulation is an active learning strategy with the students participating in a realistic situation. Students with any learning style benefit from the experience of simulation, but Kolb "categorized nursing as a profession that attracts diverging learners" (as cited in Waldner & Olson, 2007, p. 7), who learn most easily using concrete experience and reflective observation. Sewchuck explained that "diverging learners…learn best from experience, but they internalize the knowledge by reflecting on the experience" (as cited in Waldner & Olson, 2007, p. 7). Simulation provides the situational experience with an interactive scenario, and then enables reflection with the thinking and sharing that occurs in the debriefing.

In a national, muti-site study taking place over three years, the National League of Nursing, along with Laerdal Medical with Jeffries (2007) as principle investigator, explored whether students who participated in simulation had better learning outcomes. In randomized control and experimental groups, 403 nursing students participated in one of three learning experiences. One student group used a pencil and paper case study, one group used a static mannequin, and one group used a high fidelity simulator. The outcome variables measured in the study included "knowledge, self-confidence, satisfaction, judgment performance" (Jeffries, 2007, p. 150). The findings indicated that the group that had an experience with the high fidelity simulator had increased self-confidence and satisfaction. In summary, the study determined that "immersion in a simulation provides the opportunity to apply and synthesize knowledge…it is expected that expanded use of simulation in nursing education will facilitate increased learning and skill transfer when students care for patients in today's complex, health care environment" (Jeffries, 2007, p. 158).

Faculty development.

At the time of the study, use of simulation was being expanded at St. Catherine University and the faculty were expected to use simulation as a learning strategy in their teaching. Faculty development was needed to prepare simulation facilitators.

The International Nursing Association for Clinical Simulation and Learning (INACSL) expressed the importance of the facilitator when the organization developed standards of best practice for simulation. The INACSL Board of Directors (2011) stated in the standards that a "proficient facilitator is required to manage the complexity of all aspects of simulation" (p.14). Several criteria for a proficient facilitator were listed and encompassed all aspects of simulation from creating a safe learning environment that encourages active learning and reflection to evaluating performance in simulation.

The literature revealed that faculty are not yet proficient in using simulation. Several barriers have been identified in the literature pertaining to the use of simulation in nursing education. Adamson (2010) found in the literature that a lack of time, support, equipment, modeling, and especially, fear of unfamiliar teaching methods were barriers for implementation of simulation. She recommended "initial and ongoing training" (Adamson, 2010, p. e80) to reduce these barriers. Jansen, Berry, Brenner, Johnson, & Larson (2010) stated that one challenge hindering the use of simulation was faculty's "inadequate knowledge of how to implement simulations" (p. e224). Seropian, Brown, Favilanes, & Driggers (2004) claimed that the "fundamental problem…is the lack of accessible expertise" (p.170). To be successful as a teaching/learning strategy, simulation must be valued and embraced by faculty. The contributing factors for faculty resistance were most often identified as lack of knowledge, preparation, and confidence in using simulation (Pardue, Tagliareni, Valiga, Davison-Price, & Orehowsky, 2005, Dowie & Phillips, 2011). Jeffries (2008) states that "faculty are not prepared for this type of teaching" (p. 70).

Workshops were identified in the literature as a successful strategy to enhance faculty abilities and attitudes regarding simulation. Kardong-Edgren and Starkweather (2008) conducted a two day simulation workshop and found that it increased faculty use of simulation. A descriptive research study by Jansen et al. (2010) looked at several faculty development activities related to simulation taking place in a nursing program over the course of a year. The activities included a two day workshop. A simulation interest and usefulness survey was administered before and after the faculty development workshop and results showed a trend toward increased comfort and interest in using simulation. King, Mosely, Hindenlang, and Kuritz (2008) successfully used an educational experience to positively influence attitudes toward the use of simulation. Finally, Wilkerson and Irby (1998) found that "workshops that are two days long or longer, involve more than one type of intervention, and are followed up…have demonstrated effects on teachers' knowledge, attitudes, and skills" (p. 390).

The literature revealed that a two day workshop worked effectively for faculty development, thus confirming the time frame of this workshop. Especially valuable was the literature that made the connection between the theoretical framework of experiential and constructivist learning to simulation. One article explained how Kolb's experiential learning theory forms a solid base for simulation. The literature reviewed connected the concept of constructivism to simulation and confirmed that the learning that takes place through simulation is constructed by the student during immersion in the scenario and reflection in the debriefing, and added confirmation that simulation is a valuable teaching/learning strategy.

Simulation and faculty development literature were explored to determine the type of training being used to educate faculty about simulation as a teaching/learning tool. A gap in the literature was discovered in that there were few research studies that specifically examined the role of faculty development as a component in the process of simulation integration into a nursing curriculum. Although the importance of faculty confidence and competence in using simulation was stressed, there was no research that explored which strategies used in faculty development were determined to enhance faculty abilities with simulation.

Engaging faculty in an interactive learning activity was determined to be an effective way to promote the objectives of the workshop. Therefore each faculty member was assigned to facilitate a simulation, including setting up the equipment and supplies for the scenario, preparing the students (who were other faculty), running the simulation, or facilitating the debriefing. This was followed by a discussion, or debriefing, of the process. Learning occurred as faculty experienced the role of simulation and debriefing facilitator and then reflected on the thoughts and feelings that were evoked. Due to the limited research on faculty development strategies specifically related to simulation, this study was undertaken to explore what faculty perceived as helpful to achieving the learning outcomes of a workshop.

Chapter Three

Project Design and Methodology

Use of simulation was increasing in each program in the nursing department at St. Catherine University to coincide with the changes in curriculum and teaching methods. Based on findings in the literature, a two-day workshop on simulation was developed and offered to nursing faculty, with the purpose of increasing knowledge about simulation, increasing skill in using simulation, and improving attitudes regarding simulation. As part of the design of the workshop, evaluation criteria were developed based on the objectives. The workshop had three main faculty objectives that were to be accomplished, increased knowledge about simulation, increased skill in using simulation, and improved attitudes regarding simulation.

Workshop.

The literature review contributed to the structure of the workshop. Wilkerson and Irby (1998) reviewed appropriate literature and reported on strategies used to improve teaching over the last century. They found that studies that looked at current best practices in faculty development demonstrated the “efficacy of longer workshops” (p. 390) and recommended workshops that are “two days long or longer” (p. 390), and thus supported the schedule of the two day workshop discussed in this study. In preparation for the workshop, faculty were asked to read three articles on aspects of simulation by Fanning (2007), Jeffries (2005), and Larew, Lessans, Spunt, Foster, & Covington (2006) and to complete five modules in the National League for Nursing Simulation Innovation Resource Center (SIRC) site, Designing and Developing Simulations, Debriefing and Guided Reflection, Teaching and Learning Strategies, Integrating Concepts, and Evaluating Simulations. The resources for faculty preparation were chosen because the authors were credible sources of information on basic but essential aspects of simulation, and the topics were appropriate for novice to competent educators in the use of simulation.

The content of the workshop was partially determined by a survey given to a convenience sample of ten nursing faculty by the Baccalaureate Nursing Department Simulation Task Force. When the faculty was asked its priorities in learning related to simulation, the results indicated faculty had the most interest in how to facilitate a simulation and debriefing. Faculty also identified that the most effective use of simulation was to bridge the gap between classroom and clinical settings, and they wanted to learn more about how to assist students transfer the knowledge and skills used in simulation to clinical practice. The respondents of the informal survey had participated in one to five simulations, with the highest number having participated in three simulations.

The simulation scenarios used in the workshop were developed using the Nursing Education Simulation Framework and the Simulation Design Template as developed and explained in Jeffries (2007). The template included simulation objectives, the degree of fidelity, scenario progression, learner cues, and debriefing. Teaching methods that allowed for significant faculty discussion time and interactive participation in simulation and debriefing were chosen because they were consistent with adult learning theory. Increasing faculty knowledge and skills regarding simulation had value to the participants who were now using this learning strategy in their teaching. The workshop was consistent with adult learning theory because it had immediate relevancy to the faculty.

The agenda for the workshop included a didactic portion in the morning which incorporated presentations on simulation components and debriefing, along with discussion amongst group members. This was followed by interactive experiences in the afternoon when each participant ran or observed either a simulation or debriefing session. Finally the attendees discussed and analyzed their process of facilitating a simulation and debriefing.

Faculty from the nursing department, consisting of associate, baccalaureate, and graduate degree programs, was invited to attend the two-day workshop on simulation and 39 faculty chose to participate in the workshop.

Survey.

To evaluate the workshop objectives a descriptive design study was conducted with workshop participants that assessed the impact of the simulation workshop on their knowledge, skills, and attitudes.

Effectiveness of the faculty development workshop on simulation was measured by an online survey conducted two to four months after the workshop. The survey was designed to explore participant self assessment in the following areas.

1. Knowledge about simulation
2. Skill in facilitating a simulation
3. Attitudes regarding simulation

The survey was developed by the researcher and included five questions in each of the three areas related to simulation mentioned above. These three composite groups were used in the analysis and reporting of the research results. The questions were reviewed by two nursing faculty with expertise in survey development and based on their feedback minor changes were made by the researcher to increase clarity. The faculty were asked to rate items using a Likert scale with values 1 (strongly disagree) through 5 (strongly agree), with 3 being neutral. Each question included the aspect of increased or improved knowledge, skill, or attitude.

St. Catherine University Institutional Review Board approval was obtained for this research. Faculty were informed that participation in the survey was voluntary and would not affect future relationships with the university, and that consent to participate was implied if the respondent chose to complete and submit the electronic survey.

All 39 faculty who participated in one of three two-day workshops on simulation were invited to take the online survey. The survey was administered through Google Docs which assured anonymity of respondents and no questions were asked that might result in identification of the respondents. The participants were colleagues of the researcher, thus anonymity was essential for honest responses.

Resources.

The resources required for this project were space, equipment, and faculty time. The workshop took place on the St. Paul campus of St. Catherine University in a classroom and the nursing lab. Because the workshop occurred during the summer when students were not in class, there was no conflict scheduling the room and lab. Equipment was needed for use in the simulation, but most was reusable and did not result in added cost expenditure. Faculty on the Baccalaureate Faculty Simulation Task Force participated in planning and conducting the workshop, which included preparing the didactic portion and the simulations to be used. The workshop preparation time for faculty participants was estimated to be eight hours and the survey time was twenty minutes.

Research participants.

The research participants included nursing faculty who had participated in a two day summer workshop on simulation. Twenty-six of the thirty-nine workshop participants (67%) responded to the survey. Demographic data of the 26 respondents revealed that four (15%) taught in the Associate Degree Program, 18 (69%) in the Baccalaureate Degree Program, and three (12%) in the Graduate Degree Program. One respondent (4%) failed to select any of the nursing programs. The largest number of participants was from the baccalaureate program which was the only program of the three that had begun using simulation. The baccalaureate program had developed a Simulation Task Force that was leveling simulations throughout the curriculum with the purpose of increasing the quality of the students' learning experiences. The task force highly encouraged baccalaureate faculty to attend the workshop, which may explain the higher number of baccalaureate attendees.

Demographics of the sample revealed that the years worked in nursing education ranged from zero to three years to greater than 20 years. The median number of years worked in nursing education was four to ten years. The number of previous simulations faculty had participated in ranged from zero to six or more. The median number of simulations previously participated in was six or more. The number of previous simulation educational opportunities attended ranged from zero to six or more. The median was one previous simulation educational opportunity. The participants on average were experienced nursing faculty who had been involved in several simulations, but had little simulation training.

Chapter Four

Results

Data were entered into the Statistical Package for the Social Sciences (SPSS) version 19. One-way ANOVA was used to assess if the means of the composite variables, increase in knowledge, skill, and improved attitude, differed by demographics, specifically nursing program, years teaching nursing, simulations previously experienced, and simulation education attended. Post-hoc analyses were performed on statistically significant results.

Individual knowledge items.

Using the one sample t-test for the individual knowledge items, the mean of each item had a statistically significant value greater than three, which was "Neutral" on the Likert scale ($p < .001$). As a more stringent test, the means of the knowledge items were re-examined using one sample t-tests and all had a statistically significant value greater than four, which was "agree" on the Likert scale, at $p < .05$, except the item, "I can now explain how adult educational theory (andragogy) supports the use of simulation" ($p = .055$) (see Table 1). The result indicated that on average participants felt the workshop increased their simulation knowledge.

Table 1

Mean Participant Responses to Individual Survey Questions - Knowledge Questions

Question	Number of Responses	Mean Response	*p*-value[a] H_0: Mean=3 (H_0:Mean=4)
The pre-workshop SIRC (Simulation Innovation Resource Center) modules increased my understanding of simulation as a clinical teaching tool.	26	4.42	<.001 (.002)
The assigned articles (by Fanning, Jeffries, and Larew) increased my understanding of simulation.	26	4.38	<.001 (.003)
The Power Point presentations helped me to better define concepts of simulation.	26	4.27	<.001 (.025)
The discussions among participants in the classroom increased my understanding of simulation.	26	4.46	<.001 (.001)
I can now explain how adult educational theory (andragogy) supports the use of simulation.	26	4.23	<.001 (.055)

Note. [a]T-test results comparing mean participant responses to Likert neutral-point of 3 (Likert agree-point of 4).

Individual skill items.

Using the one sample t-test for the skill items, the mean of each individual item had a statistically significant value greater than three, which was “Neutral” on the Likert scale ($p < .001$). As a more stringent test, the skill items were reexamined and it was found that three of the five had a statistically significant value greater than four, which was “Agree” on the Likert scale, at $p < .05$. The two items not statistically significant were, “My skill in performing the role of faculty facilitator during the student preparation phase (review of environment, role determination) increased” ($p = .09$), and “My skill in running a simulation scenario increased” ($p = .13$) (see Table 2). The result of the one sample t-test indicates that on average participants felt the workshop increased their skills in running simulation.

Table 2

Mean Participant Responses to Individual Survey Questions - Skill Questions

Question	Number of Responses	Mean Response	*p*-value[a] H_0: Mean=3 (H_0: Mean=4)
My ability to use simulation as a teaching tool was increased by participating in an actual simulation.	26	4.54	<.001 (.001)
My ability to use simulation was increased by viewing others participating in simulation.	26	4.54	<.001 (<.001)
My skill in performing the role of faculty facilitator during the student preparation phase (orientation to the environment, role determination) increased.	26	4.23	<.001 (.093)
My skill in running a simulation scenario increased.	26	4.29	<.001 (.130)
My skill in performing the role of faculty facilitator during the debriefing increased.	26	4.31	<.001 (.015)

Note. [a]T-test results comparing mean participant responses to Likert neutral-point of 3 (Likert agree-point of 4).

Individual attitude items.

Using the one sample t-test for the attitude items, the mean of each individual item had a statistically significant value greater than 3, which was “Neutral” on the Likert scale ($p < .001$). As a more stringent test, the attitude items were reexamined and it was found that all of them had a statistically significant value greater than 4, which was “Agree” on the Likert scale, at $p < .05$, except one item, “I anticipate gaining more satisfaction from my teaching through the use of simulation” ($p = .15$) (see Table 3). The result of the one sample t-test indicates that on average participants felt their attitude regarding simulation improved after attending the workshop.

Overall, the results positively supported and affirmed all three research questions which asked if a faculty workshop would increase participants’ knowledge about simulations, increase their skills using simulations, and improve their attitude toward simulations.

Table 3

Mean Participant Responses to Individual Survey Questions - Attitude Questions

Question	Number of Responses	Mean Response	*p*-value[a] H_0: Mean=3 (H_0: Mean=4)
I have a more positive attitude about the use of simulation as an effective teaching/learning strategy in nursing education.	26	4.46	<.001 (.003)
I now see that simulation has great potential for bridging the gap between classroom theory and clinical practice.	25	4.68	<.001 (<.001)
I have come to believe that the benefits of simulation outweigh its costs (for example, the value of the learning versus the time and resources required).	26	4.31	<.001 (.022)
I can better envision how simulation might be incorporated into the courses I teach.	26	4.46	<.001 (<.001)
I anticipate gaining more satisfaction from my teaching through the use of simulation.	25	4.16	<.001 (.147)

Note. [a]T-test results comparing mean participant responses to Likert neutral-point of 3 (Likert agree-point of 4).

Composite groups.

The survey included five questions in each of three areas related to simulation. Five survey items measured faculty's perceptions related to an increase in simulation knowledge; five items measured faculty's perceptions related to an increase in skill using simulation; and five items measured faculty's perceptions related to an improvement in attitudes regarding simulation. The five questions in each area were grouped to form three composite groups, increase in knowledge, increase in skill, and improvement in attitude.

Composite knowledge items.

Five items were grouped together to calculate the knowledge composite mean score. The mean was 4.354 ($SD = 0.45$). When applying a one sample t-test for the knowledge composite mean score, there was a statistically significant value greater than 4, which was "Agree" on the Likert scale, $p < .001$, affirming the first research question which asked if faculty knowledge about simulation increased after participating in a simulation workshop.

Composite skill items.

Five items were grouped together to calculate the skill composite mean score. The mean was 4.362 ($SD = 0.59$) Using the one sample t-test for the skill composite mean score, the skill composite had a statistically significant value greater than 4, which was "Agree" on the Likert scale, $p = .003$ affirming the second research question which asked if faculty skill in running simulation increased after participating in a simulation workshop.

Composite attitude items.

Five items were grouped together to calculate the attitude composite mean score. The mean was 4.467 ($SD = 0.43$). Using a one sample t-test to analyze the skill composite mean score, the mean score was found to have a statistically significant value greater than 4, which was “Agree” on the Likert scale, $p < .001$ affirming the third research question asking if faculty attitudes regarding simulation improved after participating in a simulation workshop.

The surveys were tested for reliability or internal consistency, using Cronbach’s alpha, within the composite groups (increase in knowledge, increase in skill, and improvement in attitude). The composite groups reliability measures were alpha = 0.710 (knowledge), 0.850 (skill), and 0.674 (attitude). The result for the knowledge items suggests internal consistency; the result for the skill items shows very good internal consistency; the result for the attitude items was considered acceptable due to the small sample size and the explorative nature of the study.

Tests by type of nursing program.

Descriptive statistics of the composite variables related to the respondent’s nursing program.

The total number of respondents to the composite variable, increase in knowledge, was 26. One participant’s responses were not used to compute this table because the respondent failed to respond to the program question. The overall mean of the composite variable, increase in knowledge, was 4.368 (SD = 0.45).

The average for the composite variable, increase in knowledge, for faculty teaching in the associate degree program was 4.050 (SD = 0.70), with the number of respondents being four. The average for the composite variable, increase in knowledge, for faculty teaching in the baccalaureate degree program was 4.400 (SD = 0.39), with the number of respondents being 18. The average for the composite variable, increase in knowledge, for the graduate degree program was 4.600 (SD = 0.40), with the number of respondents being three (see Table 4).

Table 4

Descriptive Statistics by Nursing Program
Composite Variable – Increase in Knowledge

Program	Number of Responses	Mean Response	*SD*
Total Respondents	25	4.368	0.45
Associate Degree Program	4	4.050	0.70
Baccalaureate Degree Program	18	4.400	0.39
Graduate Degree Program	3	4.600	0.40

The total number of respondents to the composite variable, increase in skill, was 26; one participant's responses were not used to compute this table because there was no response to type of program. The mean of the total response on the composite variable, increase in skill, was 4.376 (*SD* = 0.60). The average for the composite variable, increased skill, for the associate degree program was 4.055, (*SD* = 0.57), with the number of respondents being four. The average for the composite variable, increased skill, for the baccalaureate degree program was 4.333, (*SD* = 0.62), with the number of respondents being 18. The average for the composite variable, increased skill, for graduate degree program was 4.400, (*SD* = 0.72), with the number of respondents being three (see Table 5).

Table 5

Descriptive Statistics by Nursing Program
Composite Variable – Increase in Skill

Program	Number of Responses	Mean Response	*SD*
Total Respondents	25	4.376	0.60
Associate Degree Program	4	4.055	0.57
Baccalaureate Degree Program	18	4.333	0.62
Graduate Degree Program	3	4.400	0.72

The total number of respondents for the composite variable, improved attitude, was 24; two participant's responses were not used to compute this table because one failed to respond to type of program and one to an attitude question. The mean of the total response on the composite variable, improved attitude, was 4.467 (*SD* = 0.43). The average for the composite variable, improved attitude, for the associate degree program was 4.450 (*SD* = 0.60) with four respondents. The average for the composite variable, improved attitude, for the baccalaureate degree program was 4.482 (*SD* = 0.43) with 17 respondents. The average for the composite variable, improved attitude, for the graduate degree program was 4.400 (*SD* = 0.35) with three respondents (see Table 6).

Table 6

Descriptive Statistics by Nursing Program
Composite Variable – Improved Attitude

Program	Number of Responses	Mean Response	*SD*
Total Respondents	24	4.467	0.43
Associate Degree Program	4	4.450	0.60
Baccalaureate Degree Program	17	4.482	0.43
Graduate Degree Program	3	4.400	0.35

Comparing composite variables by respondent's nursing program.

The researcher was interested to see if the increase in knowledge, skill, and attitudes differed by program. Using one-way ANOVA, the mean of the composite variable, increase in knowledge, was compared among the three degree programs to determine if there was any differences among the mean responses by program. No statistical difference was found, F = 1.478 (p = .250). For the composite, increase in skill, there was no statistical difference among the degree programs, F = 0.199 (p = .821). For the composite of improved attitude there was no statistical difference among the degree programs, F = 0.046 (p = .955) (see Table 7). Therefore, there was no statistically significant difference in the means of increase in knowledge, increase in skill, and improved attitude across degree programs. If the F was significant the post hoc tests would include Tukey HSD.

Table 7

Comparing Composite Variables by Respondents' Nursing Program
One-way ANOVA results

	Composite Variables		
Respondents	Increase in Knowledge *F(p)*	Increase in Skill *F(p)*	Improvement in Attitude *F(p)*
Nursing program	1.478 (.250)	0.199 (.821)	0.046 (.955)

Tests by number of years worked in nursing education.

Descriptive statistics of the composite variables related to number of years worked in nursing education.

There were 26 respondents for the items of the composite variable, increase in knowledge. Overall mean for this variable was 4.354 (*SD* = 0.45). Six respondents worked 0-3 years, nine worked 4-10 years, six worked 11-15, and five worked greater than 20 years. For participants who worked 0-3 years their increase in knowledge composite mean score was 4.267 (*SD* = 0.52), those working 4-10 years had a mean score of 4.444 (*SD* = 0.31), those working 11-15 years had a mean score of 4.300 (*SD* = 0.41), there were no respondents who worked 16-20 years, and those working greater than 20 years had a mean score of 4.360 (*SD* = 0.69) (see Table 8).

Table 8

Descriptive Statistics by Number of Years Worked in Nursing Education
Composite Variable – Increase in Knowledge

Number of Years	Number of Responses	Mean Response	*SD*
Total Respondents	26	4.354	0.45
0-3	6	4.267	0.52
4-10	9	4.444	0.31
11-15	6	4.300	0.41
16-20	0		
> 20	5	4.360	0.69

There were 26 respondents for the items of the composite variable, increase in skill. Overall mean for this variable was 4.362 (*SD* = 0.60). Descriptive information includes six respondents who worked 0-3 years, nine who worked 4-10 years, six who worked 11-15, and five who worked greater than 20 years. For participants who worked 0-3 years their increase in skill composite mean score was 4.467 (*SD* = 0.60), those working 4-10 years had a mean score of 4.400 (*SD* = 0.69), those working 11-15 years had a mean score of 3.967 (*SD* = 0.57), there were no respondents who worked 16-20 years, and those working greater than 20 years had a mean score of 4.640 (*SD* = 0.26) (see Table 9).

Table 9

Descriptive Statistics by Number of Years Worked in Nursing Education Composite Variable – Increase in Skill

Number of Years	Number of Responses	Mean Response	*SD*
Total Respondents	26	4.362	0.60
0-3	6	4.467	0.60
4-10	9	4.400	0.69
11-15	6	3.967	0.57
16-20	0		
> 20	5	4.640	0.26

There were 24 respondents for the items of the composite variable, improvement in attitude. Overall mean for this variable was 4.467 (*SD* = 0.43). Six respondents worked 0-3 years, nine worked 4-10 years, six worked 11-15, and five worked greater than 20 years. For participants who worked 0-3 years their increase in attitude composite mean score was 4.567 (*SD* = 0.56), those working 4-10 years had a mean score of 4.525 (*SD* = 0.28), those working 11-15 years had a mean score of 4.080 (*SD* = 0.50), there were no respondents who worked 16-20 years, and those working greater than 20 years had a mean score of 4.640 (*SD* = 0.22) (see Table 10).

Table 10

Descriptive Statistics by Number of Years Worked in Nursing Education Composite Variable – Improvement in Attitude

Number of Years	Number of Responses	Mean Response	*SD*
Total Respondents	26	4.467	0.43
0-3	6	4.567	0.56
4-10	9	4.525	0.28
11-15	6	4.080	0.50
16-20	0		
> 20	5	4.640	0.22

Comparing composite variables by number of years worked in nursing education.

The researcher was interested to see if the means of increase in knowledge, skills, and attitude differed by number of years participant had taught nursing. Using one-way ANOVA the mean of the composite variable, increase in knowledge, was compared among the four categories of number of years to see if there was any difference among the mean responses. No statistical difference was found, F =.204 (p =.893). Comparing the mean of the composite variable, increase in skill, there was no statistical difference for the groups, F = 1.376 (p =.276). And comparing the mean of the composite variable, attitude, there was no statistical difference for the groups, *F* = 1.985 (*p* =.149) (see Table 11). If the F was significant the post hoc tests would include Tukey HSD.

Table 11

Comparing Composite Variables by Respondents' Years Worked in Nursing Education One-way ANOVA results

	Composite Variables		
Respondents	Increase in Knowledge *F(p)*	Increase in Skill *F(p)*	Improvement in Attitude *F(p)*
Years in nursing education	0.204 (.893)	1.376 (.276)	1.985 (.149)

Note. Significantly significant values are in boldface.

Tests by number of previous simulation experiences.

The survey gave the participants five choices for reporting the number of simulations in which they had previously participated. The choices were 0, 1, 2-3, 4-5, 6 or more. Because there were less than two participants in one of the choices (2-3 simulations), it was merged with another choice (one simulation) to allow post-hoc analysis.

Descriptive statistics of the composite variables related to respondent's number of previous simulation experiences.

There were 26 respondents for items in the composite variable, increase in knowledge. Overall mean for this composite variable was 4.354 (*SD* = 0.45). Three respondents had never participated in a simulation and the mean was 4.267 (*SD* = 0.31); three had participated in 1-3 simulations with a mean of 4.667 (*SD* = 0.58); six people had participated in 4-5 simulations and the mean was 3.833 (*SD* = 0.50), and 14 people had participated in 6 or more simulations with a mean of 4.529 (*SD* = 0.22) (see Table 12).

Table 12

Descriptive Statistics by Number of Previous Simulation Experiences Composite Variable – Increase in Knowledge

Number of Previous Simulations	Number of Responses	Mean Response	*SD*
Total Respondents	26	4.354	0.45
0	3	4.267	0.31
1-3[a]	3	4.667	0.58
4-5	6	3.883	0.50
6 or more	14	4.529	0.22

Note. [a] Number of responses to 1 previous simulation and 2-3 previous simulations were combined to have sufficient responses for post-hoc analysis.

There were also 26 respondents for items in the composite variable, increase in skill. Overall mean for the composite variable, increase in skill, was 4.362 (*SD* = 0.60). For the three who had never participated in a simulation, the mean was 3.800 (*SD* = 0.20); three did 1-3 simulations with a mean of 4.333 (*SD* = 0.83); six participated in 4-5 simulations having a mean of 3.933 (*SD* = 0.53); and 14 did 6 or more simulations for a mean of 4.671 (*SD* = 0.45) (see Table 13).

Table 13

Descriptive Statistics by Number of Previous Simulation Experiences Composite Variable – Increase in Skill

Number of Previous Simulations	Number of Responses	Mean Response	*SD*
Total Respondents	26	4.362	0.60
0	3	3.800	0.20
1-3[a]	3	4.333	0.83
4-5	6	3.933	0.53
6 or more	14	4.671	0.45

Note. [a] Number of responses to 1 previous simulation and 2-3 previous simulations were combined to have sufficient responses for post-hoc analysis.

There were 24 responses for items in the composite, improved attitude. The overall mean for this was 4.467 (*SD* = 0.43). For the two respondents who had never participated in a simulation the mean was 4.200 (*SD* = 0.28); three participated in 1-3 simulations with a mean of 4.667 (*SD* = 0.31); six had done 4-5 simulations for a mean of 4.300 (*SD* = 0.65); and 13 participated in 6 or more simulations with a mean of 4.539 (*SD* = 0.34) (see Table 14).

Table 14

Descriptive Statistics by Number of Previous Simulation Experiences Composite Variable – Improvement of Attitude

Number of Previous Simulations	Number of Responses	Mean Response	*SD*
Total Respondents	24	4.467	0.43
0	2	4.200	0.28
1-3[a]	3	4.667	0.31
4-5	6	4.300	0.65
6 or more	13	4.539	0.34

Note. [a] Number of responses to 1 previous simulation and 2-3 previous simulations were combined to have sufficient responses for post-hoc analysis.

Composite variables related to the respondent's number of previous simulation experiences.

The researcher was interested to see if the increase in knowledge, skill, and attitudes differed by number of participant's previous simulation experiences. Using one-way ANOVA the mean of the composite variable, increase in knowledge, was compared among the four categories of number of simulations participated in and found that there was a significant difference among the mean responses by simulation experience, F = 6.447 (p = .003). For the composite variable, increase in skill, there was also a statistical difference for the groups, F =

4.533 (p = .013). For the composite variable, attitude, there was no statistical difference for the groups, F = 0.871 (p = .473) (see Table 15).

Table 15

Comparing Composite Variables by Respondents' Previous Simulation Experience One-way ANOVA results

	Composite Variables		
Respondents	Increase in Knowledge *F(p)*	Increase in Skill *F(p)*	Improvement in Attitude *F(p)*
Previous simulations	**6.447 (.003)**	**4.533 (.013)**	0.871 (.473)

Note. Significantly significant values are in boldface.

Post hoc tests, Tukey HSD, were conducted to determine which groups' means differed. Results identified the mean response of participants who had previously participated in 4-5 simulations differed from the mean response of participants who had previously participated in only 1-3 simulations; the mean difference was significant at the .05 level. Additionally results show the mean response of participants who had previously participated in 4-5 simulations differed from the mean response of participants who had previously participated in 6 or more simulations; the mean difference was significant at the .05 level.

How the groups differed was determined by referring to the means of the composite variables for each of the groups. Considering the composite variable, increase in knowledge, it was determined that the participants having 4-5 previous simulation experiences had the lowest mean of 3.8333 (SD = 0.50). Participants having 6 or more previous simulation experiences had a mean of 4.5286 (SD = 0.22), and those having 1-3 previous simulation experiences had a mean of 4.667 (*SD* = 0.58). Looking at the composite variable, increase in skill, the participants having 4-5 previous simulation experiences had a mean of 3.933 (*SD* = 0.53), and participants having 6 or more simulation experiences had a mean of 4.6714 (*SD* = 0.45). The results could indicate that participants who had not worked with many simulations were in a better position to learn and had much more to glean from the workshop, and the those who had participated in many simulations in the past perhaps had reached a stage in the development of their use of simulations that they recognized the subtle points in which they could improve. Conversely the group exposed to 4-5 previous simulations were knowledgeable about the content in the workshop and not advanced enough to mine subtleties of learning from participation in the activities.

Tests by number of simulation educational opportunities attended.

Descriptive statistics of the composite variables related to the respondent's number of previous simulation educational opportunities attended.

There were 26 respondents for items in the composite variable, increase in knowledge. Overall mean for this composite variable was 4.354 (*SD* = 0.45). Five respondents had no previous education regarding simulation and the mean was 4.1200 (*SD* = 0.23); ten had one previous simulation education opportunity with a mean of 4.380 (*SD* = 0.52); six had 2-3 previous simulation education opportunities with a mean of 4.333 (*SD* = 0.58); three had had 4-5 previous simulation educational opportunities and the mean was 4.600 (*SD* = 0.35); two people had 6 or more previous simulation educational opportunities with a mean of 4.500 (*SD* = 0.14) (see Table 16).

Table 16

Descriptive Statistics by Number of Previous Simulation Educational Experiences Attended Composite Variable – Increase in Knowledge

Number of Sim Education Attended	Number of Responses	Mean Response	*SD*
Total Respondents	26	4.354	0.45
0	5	4.120	0.23
1	10	4.380	0.52
2-3	6	4.333	0.58
4-5	3	4.600	0.35
6 or more	2	4.500	0.14

There were also 26 respondents for items in the composite variable, increase in skill. Overall mean for the composite variable, increase in skill, was 4.362 (*SD* = 0.60). For the five respondents who had no previous simulation educational experience, the mean was 4.200 (*SD* = 0.75); ten had 1 previous simulation educational experiences with a mean of 4.2400 (*SD* = 0.68); six had 2-3 previous simulation educational experiences with a mean of 4.533 (*SD* = 0.53); three had 4-5 previous simulation educational experiences having a mean of 4.533(*SD* = 0.42); and two had 6 or more previous simulation educational experiences for a mean of 4.600 (*SD* = 0.28) (see Table 17).

Table 17

Descriptive Statistics by Number of Previous Simulation Educational Experiences Attended Composite Variable – Increase in Skill

Number of Sim Education Attended	Number of Responses	Mean Response	*SD*
Total Respondents	26	4.362	0.60
0	5	4.200	0.75
1	10	4.240	0.68
2-3	6	4.533	0.53
4-5	3	4.533	0.42
6 or more	2	4.600	0.28

There were 24 responses for items in the composite, improved attitude. The overall mean for this was 4.467 (*SD* = 0.43). For the five respondents who had never had a previous simulation educational opportunity the mean was 4.400 (*SD* = 0.51); eight reported having one previous simulation educational opportunity with a mean of 4.4000 (*SD* = 0.50); six had 2-3 previous simulation educational opportunities mean of 4.4667 (*SD* = 0.39); three had 4-5 previous simulation educational opportunities with a mean of 4.8667 (*SD* = 0.23); two had 6 or more previous simulation educational opportunities with a mean of 4.3000 (*SD* = 0.14) (see Table 18).

Table 18

Descriptive Statistics by Number of Previous Simulation Educational Experiences Attended Composite Variable – Improvement in Attitude

Number of Sim Education Attended	Number of Responses	Mean Response	*SD*
Total Respondents	24	4.467	0.43
0	5	4.400	0.51
1	8	4.400	0.50
2-3	6	4.467	0.39
4-5	3	4.867	0.23
6 or more	2	4.300	0.14

Composite variables related to the respondent's number of previous simulation educational opportunities attended.

The researcher was interested to see if the means of increase in knowledge, skills, and attitude differed by the number of simulation educational opportunities the respondents had previously. Using one-way ANOVA the mean of the composite variable, increase in knowledge, was compared among the four categories of previous simulation educational opportunities to see if there was any difference among the mean responses. No statistical difference was found, F = 0.584 (p = .677). Comparing the mean of the composite variable, increase in skill, there was no statistical difference for the groups, *F* = 0.420 (*p* = .793) Comparing the mean of the composite variable, attitude, there was no statistical difference for the groups, *F* = 0.762 (*p* = .563) (see Table 19). If the *F* was significant the post hoc tests would include Tukey HSD.

Table 19

Comparing Composite Variables by Respondents' Number of Simulation Educational Opportunities Attended

One-way ANOVA results

	Composite Variables		
Respondents	Increase in Knowledge *F(p)*	Increase in Skill *F(p)*	Improvement in Attitude *F(p)*
Sim education attended	0.584 (.677)	0.420 (.793)	0.871 (.473)

Note. Significantly significant values are in boldface.

Chapter Five

Discussion

The goals of the workshop on simulation were to increase faculty knowledge and skill regarding the use of simulation, and to improve faculty attitudes toward simulation. To determine if these goals were accomplished, faculty participant responses to a post-workshop survey were analyzed. Participant responses showed that, on average, their knowledge and skill were increased, and their attitudes toward simulation were improved. The findings were consistent with prior research done by Jansen et al. (2010), and King et al. (2008).

Jansen et al. (2010) reported on a year-long state-wide project that was initiated to increase faculty interest in using simulation. The major activity during the year was a two day workshop which was structured very similarly to the workshop reported in this study. Content on the fundamentals of simulation were presented, including its use as a teaching/learning tool, and how to conduct a debriefing. A hands-on experience with a simulation scenario and debriefing was provided. Pre and post surveys at the beginning and end of the year using a Likert scale of the faculty were conducted which indicated a “trend, although not statistically significant, toward increased comfort in creating and using simulation scenarios, interest in incorporating simulation into courses, and perceptions of usefulness of simulation” (p.e228). There were some differences between the study in the Jansen et al. (2010) report and this study. The workshop that Jansen et al. (2010) discussed included opportunities for the faculty to write simulation scenarios including an information session on writing objectives. The workshop at St. Catherine University did not include this aspect of simulation because scenarios were being written by the Simulation Task Force and not by the faculty at large, thus it was not a goal of the workshop. The survey reported on by Jansen et al. (2010) included space for written comments in contrast to this study which did not ask for respondents' comments and thus was devoid of qualitative data regarding faculty perceptions of the workshop. The Jansen et al. (2010) state-wide post survey was obtained after several faculty development activities occurred which made it difficult to determine how much the workshop contributed to the results. The study reported in this paper did not include any intervention besides the workshop.

King et al. (2008) recognized that there were gaps in faculty training in the use of simulation which resulted in its limited use. The researchers initially conducted an electronic survey with a Likert scale, to determine faculty use and intention to use simulation. In the summary of the results of the survey, King et al. (2008) stated that "an absence of formal training was believed to have contributed to the lack of comfort and competence by faculty participants" (p. 8) The survey results "supported the need for an educational program as an intervention to increase [simulation] use" (p. 8), and thus provided rationale for the use of a workshop to develop faculty knowledge, skill, and attitudes about simulation.

King et al. (2008) then developed an educational intervention and evaluated its effectiveness. Their instrument was a pre and post intervention survey using a Likert scale. It measured faculty perceptions of the value of simulation as well as faculty comfort and competence with simulation. A Likert scale was also used in the survey tool of this study. The results of the study reported here were analyzed by creating composites of several questions that addressed a similar topic and this was also a strategy used by King et al. (2008). It had similarities to this reported study, with the King et al. (2008) description of competence aligning with the this study's composites of knowledge and skill, and with the King et al. (2008) value and comfort similar to this study's composite of attitude. Populations of both studies were similar in number with King et al. (2008) having 34 respondents, and this study having 26. The results reported by King et al. (2008) showed that “attitude was found to be the most important predictor” of intent to use simulation. Although this study did not ask a specific question regarding intent to use, the composite of attitude questions is believed to be related to intent to use simulation. It is surmised that the respondents that indicated improvement in attitude will be more likely to plan to use simulation.

Kardong-Edgren et al. (2008) in a prospective, descriptive, repeated measures design used a qualitative tool to explore an approach to integrating simulation in a curriculum. The framework employed in the study by Kardong-Edgren et al. (2008) was developed by Jeffries (2007) and was also used to develop the content of the workshop at St. Catherine University. Jeffries framework defines the aspects of simulation that are essential to consider when developing and running simulation and are consistent with the standards set forth for simulation by INACSL. Jeffries states that, “The use of simulation in education has most often been grounded in theories that focus on learner-centered practices, constructivism, and collaboration between individuals…” (2007, p. 23). Her framework was used to develop the workshop because it mirrors the theoretical framework of constructive and experiential learning applicable to a workshop for adult learners.

In the study conducted by Kardong-Edgren et al. (2008), faculty had a two day educational experience where they practiced three simulations before using them with students. After running the simulations with the students, the faculty was surveyed using the qualitative tool. The responses indicated the faculty valued the creative environment in simulation, and found that simulation facilitated student technical and communication skills, along with critical thinking. The qualitative aspect of the tool gave the respondents freedom to express their unique thinking rather than staying within the confines of pre-determined foci as this study did.

Adamson (2010) also explored the integration of simulation into nursing curricula with a descriptive study using an online survey. Demographics of the population had similarities to this study. Both used faculty who had a wide range of years teaching in nursing. Adamson's (2010) faculty respondents ranged from having one to 27 years of teaching experience with an average of 10 years, and this study had a range from zero to three up to greater than 20 years with a median of four to ten years. A mean was not attainable because the answers were stated as a range of years. One suggestion to make it easier for faculty to use simulation is to "provide initial and ongoing training" (Adamson, 2010, p.e80).

Simulation literature by Seropian et al. (2004), Adamson (2010), Wilkerson and Irby (1998), and Pardue et al. (2005), claimed that the most common reason for difficulty incorporating simulation into a nursing curriculum is faculty resistance due to lack of faculty knowledge and confidence about the use of simulation. Facilitators of simulation and debriefing must be knowledgeable about the many aspects of simulation and skilled at running a scenario and conducting a debriefing. Faculty development is essential to build faculty expertise and a quality simulation program. The findings of the study supported the value of faculty development related to simulation. After the two day workshop at St. Catherine University, participants reported an increase in simulation knowledge and skill, and an improved attitude regarding the use of simulation.

Of particular interest are the comparisons between the composite variables, increase in knowledge, increase in skill, and improved attitude by the respondents' number of previous simulation experiences. Statistical tests determined that there was a statistically significant difference in increases in knowledge and skill in some groups related to the number of previous simulations they had experienced. Further tests identified how these groups differed.

The group of participants having four to five previous simulation experiences reported the lowest increase in knowledge and the lowest increase in skill. The researcher surmised that this group already had a strong base of knowledge and skill and was familiar with the content and therefore had less to gain than the participants who had only one to three previous simulation experiences. The group with four to five previous simulation experiences also reported less increase in knowledge and skill than the group having six or more simulations. It is possible that the highly experienced group of participants was simply more advanced and therefore noticed subtle information and simulation techniques that were missed by the group with a mid-range of simulation experience.

Limitations

There were some limitations to the study related to the tool and the population. The structure of the tool and the timing of its administration may have affected the responses. The survey was developed by the researcher and had not been previously tested. The survey was conducted two to four months after the workshop and faculty perceptions may have dimmed in the intervening time. Other experiences or information related to simulation may have occurred between participating in the workshop and responding to the survey. No qualitative data was sought on the survey; thus explanations, clarifications, and additional thoughts were not obtained. Future studies may consider including this in the questions asked of the participants. The possible responses in the demographic section of the survey were structured as ranges of numbers. Asking for a specific number rather than a range would allow the analysis of the responses to reveal more useful information. The survey in this study was administered only after the workshop. Future researchers may consider administering a pre-test and post-test to measure knowledge, skill, and attitude regarding simulation before and after the workshop to avoid respondent self-reported bias. An analysis of the pre and post test responses would also lend clarity to the degree of change that occurred.

The researcher conducted the workshop and was a colleague of the faculty, thus the respondents may have been inclined to give agreeable answers. The survey was conducted anonymously to minimize this effect. The sample size was small and represented nursing degree programs in one nursing department. Therefore, results may have limited transferability to other nursing programs. Attendance at the workshop was voluntary so attendees may have felt positively about simulation previous to the workshop. This attitude may have increased their ability to gain from the workshop activities. A pre survey that explored knowledge, skills, and attitudes present before the workshop would uncover that information.

Recommendations for Future Research and Work

The research findings indicated that although faculty benefitted from the content and structure of the workshop, faculty participants in the study are now ready for an enhanced simulation workshop where they can refine their practice in the use of evaluation tools and more sophisticated cuing. At the workshop, participants verbally expressed the desire for a workshop devoted entirely to debriefing, where they can practice with a variety of debriefing techniques. Educational opportunities around simulation now being developed for this nursing faculty are considering the study results and verbal feedback in the planning of content and activities.

The readings and modules required before the workshop were seen by faculty as contributors to their knowledge. The presentations and discussions also enhanced participants' knowledge in simulation. Skill was increased by participation and observation of an actual simulation and debriefing. Therefore, it is recommended that the learning strategies consistent with constructivist and experiential theories also be used in future simulation workshops.

There have been few studies conducted to determine the results of faculty development related to simulation. Faculty proficiency in running simulation and facilitating debriefing is essential for simulation to result in positive student learning outcomes. Thus faculty development is a key component in the integration of simulation into nursing curriculum and must be included in the planning and funding of any simulation program. Further studies are needed to determine which strategies are most effective for the attendees based on the past experiences of the faculty participants.

There is a body of literature on employee training in fields other than nursing and future research might include an exploration that extends beyond nursing faculty development literature. This may reveal further strategies not yet considered that can be used in faculty education related to simulation.

The researcher will continue further work in this area as a DNP graduate. The nurse with a Doctorate in Nursing Practice is prepared to facilitate evidence based research findings into practice within systems of healthcare and healthcare education. The DNP graduate according to Hathaway, Jacob, Stegbauer, Thompson, and Graff (2006) is “essential to facilitate the translation of scientific research into practice” (p. 493). The American Association of Colleges of Nursing (AACN) (2008) states it best saying DNP graduates “provide leadership for evidence-based practice” (p.11). The DNP nurse is able to critically evaluate research, introduce findings into practice, and implement change in practice with a system. A difficulty in nursing has been the long delay in research findings making their way into practice. The nurse with a DNP is able to, “put the theory-research-practice loop that has been advocated for years into action” (Hathaway et al., 2006, p. 490). A nurse with a DNP has developed an understanding of systems and healthcare policy with the purpose of facilitating needed changes (AACN, 2008).

Future work occurring in the HSSOH system will expand simulation workshops to include other faculty in the school. The AACN Essential VI (AACN, 2008) requires the DNP to work collaboratively with other health care professionals. And the IOM mandate calls for professional collaboration as an essential ingredient in the endeavor to increase safety and quality in healthcare. Interprofessional education is part of the strategic plan of the HSSOH and simulation can offer a beginning collaboration between the professions involved. There is leverage in the HSSOH for interprofessional projects, which are supported by the administration and the strategic direction to "expand interdisciplinary connections within St. Catherine University" (found online at St. Catherine University website, 2012, School of Health). Based on this study, it is surmised that interprofessional faculty development will increase faculty's knowledge and skill and improve its attitude regarding the use of simulation.

Documents referenced from IOM (2003), QSEN (2009), NLN in Jeffries (2007), the Carnegie Foundation in Benner (2010), and the HSSOH at St. Catherine University (2012) emphasized the importance of interprofessional education in the preparation of healthcare professionals. Root cause analyses, conducted after a mistake occurs in healthcare, have revealed that the leading cause of errors can be attributed to ineffective communication among the various healthcare professionals involved in the care of the patient. It is essential for students to learn the skill of interprofessional collaboration to enable them to provide effective and safe care for patients. More exploration and research are needed in the area of interprofessional simulation to fully determine the value of simulation in this venue.

Within the HSSOH are located the disciplines associated with healthcare. The organizational position of the healthcare disciplines within the school provides a means for collaboration. Future workshops on simulation that include faculty from all departments within the school of health will support the interprofessional aspects of the mission of the HHSOH by fostering faculty connections and interprofessional collaboration. It is hypothesized that the educational activities in the form of simulation that may result will enhance the ability of all students in the school of health to work effectively with other healthcare professionals when they graduate and enter practice as professionals.

Conclusion

The study, *Responses to a Faculty Development Workshop on Simulation*, revealed that a simulation workshop can positively influence faculty knowledge, skill, and attitude. It is necessary to use principles of adult learning imbedded in constructivist learning theory and experiential learning theory in the development of faculty workshops. By noting how many previous simulations the attendees have experienced, an appropriate level of content can be offered to produce positive outcomes. Increasing the knowledge and skill and improving the attitude of faculty related to the use of simulation will produce graduates that provide competent and safe care in clinical practice.

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