ATHABASCA UNIVERSITY

USING SIMULATION-BASED PRACTICE LABS TO PROMOTE INSTRUCTIONAL EFFECTIVENESS AND COMMUNITY COHESION IN A BLENDED DISTANCE NURSING PROGRAM

BY

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Dedication

As a daughter, I would like to dedicate this dissertation to my mother Catherine Scalzo for her unconditional love and support. She always had the confidence in me that I could do anything I put my mind to. Although she passed away just before I completed my doctorate, her words of encouragement remain with me today.

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Abstract

An on-site simulation-based practice lab was conducted with 42 students enrolled in a blended distance practical nursing diploma program at the end of their first year of study, prior to their clinical placements. The six-hour practice lab involved an orientation, small group activities involving three obstetric-related scenarios using the moderate fidelity simulator Noelle®, and a debriefing activity. An evening social activity was also provided. The study used a mixed method research design involving both quantitative and qualitative methods. Data were collected using a demographic questionnaire, a 20-item pre-test/post-test knowledge quiz, and three National League for Nursing (NLN) instruments — the Simulation Design Scale, the Educational Practices in Simulation Scale, and the Learner Satisfaction and Self-Confidence in Learning Scale — as well as a pre- and post-lab administration of Rovai's (2002b) Classroom Community Scale. The qualitative component of the study involved semi-structured interviews with 25 students, three lab facilitators, and five clinical placement instructors. Analysis of data collected before and after the simulation-based lab revealed a significant increase in knowledge and sense of community in the group as a whole. Analysis of the results of the NLN instruments indicated that the simulation-based practice lab was instructionally effective. Students were highly positive in their ratings of the design elements and implementation of the simulation-based practice lab, satisfied with the simulation-based learning activities, and confident in their ability to provide patient care. The qualitative analysis added a rich, descriptive understanding of how the simulation-based practice lab promoted instructional effectiveness (i.e., skills and knowledge, confidence, and learner satisfaction), preparation for clinical placement, and community

cohesion. Thematic analysis of the interview data identified the following major themes: benefits to distance learners, nurse-patient interaction, theory to practice, positive experience, sense of community, and supportive learning (student interviews); benefits of simulation experience, facilitator role, and technology (facilitator interviews); and theory to practice, positive experience, and sense of community (clinical instructor interviews). This research supports the use of on-site simulation-based practice labs as a means to provide greater readiness for clinical practice and strengthen the sense of community among distance learners.

Keywords: Distance education, simulation-based practice lab, nursing education, community cohesion, blended learning, learner satisfaction, self-confidence

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CHAPTER 1

INTRODUCTION

For more than 30 years, distance education has provided a means for nursing programs to meet the needs of rural and remote communities, helping them face the challenges of a changing healthcare system and continued nursing shortages. The accessibility and flexibility of distance nursing programs makes them well suited to adult learners with multiple responsibilities and demands on their time, and for many learners distance education is the only way they can pursue post-secondary studies. Moreover, nursing students enrolled in distance programs study in their home communities and are likely to remain there after graduation and be retained in the workforce. They also avoid the lack of familiarity, family disruption, and increased living expenses associated with moving away and studying on-site at a university or college.

While distance education has become recognized as a valuable and effective way of delivering nursing programs (Alexander, Polyakova-Norwood, Johnston, Christensen, & Loquist, 2003; Carr & Farley, 2003; Field, 2002; Hyde & Murray, 2005), it is not sufficient for transforming nursing students into the competent, knowledgeable, and highly skilled practitioners needed for today's complex healthcare environment. Most distance nursing programs today use a form of blended delivery, where the theory component is offered online and/or through other technology-mediated methods such as audio- or video-conferencing, while practical labs and clinical placements are done on-site at a local health facility or learning centre. However, the transition from theory to practice can be difficult, and students often lack skills, knowledge, and confidence as

they begin the practical part of their programs. As a result, distance nurse educators are continually looking for effective teaching methods to prepare students for clinical practice. One of the newest and most promising strategies being implemented in nursing education today is the use of computerized human patient simulators and simulations based on clinical scenarios. However, to date, little research has been reported on teaching strategies to prepare distance nursing students for clinical practice, and even fewer studies have been conducted on the instructional effectiveness of using simulation and simulated practice as the means to do so. Therefore, a goal of this study was to contribute to this currently understudied area and hopefully to provide insight and increased understanding of the effect an on-site simulation-based practice lab would have on instructional effectiveness (i.e., knowledge, skill, learner satisfaction, and self-confidence) in preparing distance nursing students for clinical practice.

In addition, several studies on the experiences of instructors and students have concluded that there is too little interaction or too few interactive learning opportunities in distance nursing education programs to establish peer support and collaboration, and that these shortcomings affect student learning (Billings, Skiba, & Connors, 2005; Hyde & Murray, 2005; Sit, Chung, Chow, & Wong, 2005). These findings are of particular concern as nursing programs (including the program in this study), regardless of how they are delivered, seem to share common values about the importance of establishing a learning community where students feel a sense of belonging or connection with other learners. There is extensive literature supporting the need for establishing a sense of community among learners studying at a distance in order to enhance the learning experience and actively engage students in the learning process (Conrad, 2005;

Haythornthwaite, Kazmer, Robins, & Shoemaker, 2000; Palloff & Pratt, 1999; Rovai & Barnum, 2003). However, further research is needed on blended distance nursing programs to investigate how on-site, face-to-face learning activities can affect community cohesion, and the extent to which they may enhance learning and actively engage students in the learning process. Therefore, an additional goal of this study was to contribute to the research and hopefully develop a better understanding of the relationship between students' sense of belonging to a learning community and their participation in on-site, face-to-face, collaborative group activities, such as the simulation-based practice lab used in this study.

Context of the Study

Confederation College offers a two-year blended distance practical nursing diploma program through seven campuses located in the vast region of Northwestern Ontario. Not every campus has a student enrolment every year. The class that participated in this study involved only five of the seven campuses. Table 1 presents an overview of the courses in the program with associated hours of instruction. This research study took place in the second semester course, Nursing Practice II – Lab Theory & Practice.

Table 1

Content of the Practical Nursing Diploma Program

Year One of the Practical Nursing Diploma Program	
Semester 1 (15 weeks)	Hours per week
Theory Courses:	
College Writing Skills	4 hours
Anatomy and Physiology I	3 hours
Professional Growth	3 hours
Nursing Theory I	3 hours
Human Relationships	3 hours
Developmental Psychology	3 hours
Lab/Clinical Courses:	
Nursing Practice I	4 hours
Semester 2 (15 weeks)	
Theory Courses:	
Anatomy and Physiology II	3 hours
Nursing Theory II	3 hours
Health Assessment	4 hours
Contemporary Community & Family: The Aboriginal Context	3 hours
Lab/Clinical Courses:	
Nursing Practice II – Lab Theory & Practice*	4 hours
Nursing Practice II – Clinical	12 hours
Year Two of the Practical Nursing Diploma Program	
Semester 3 (15 weeks)	
Theory Courses:	
Communications for Practical Nurses	3 hours
Professional Growth II	3 hours
Pharmacology I	3 hours
Nursing Theory III	4 hours
Pathophysiology I	4 hours
Lab/Clinical Courses:	
Nursing Practice III – Lab Theory & Practice	4 hours
Nursing Practice III – Clinical	14 hours
Semester 4A (10 weeks)	
Theory Courses:	
Pharmacology II	4 hours
Nursing Theory IV	4 hours
Pathophysiology II	3 hours
Lab/Clinical Courses:	
Nursing Practice IV – Lab Theory & Practice	3 hours
Nursing Practice IV – Clinical	14 hours
Semester 4B (4 weeks)	
Nursing Practice V – Clinical	40 hours
Nursing Practice VI – Clinical	40 hours

*Course chosen for study.

In the practical nursing diploma program, theory courses are taught by point-to-point video conferencing. An instructor from one of the campuses presents a two-hour lesson, which students access by travelling to the nearest Contact North/Contact Nord Education Access Centre (Contact North/Contact Nord, 2010) located at the six other regional campuses. In this manner, students attend classes in small groups ranging from 4 to 12 students in each of the six campus locations. The learning management system, Blackboard Learn™, is also used to post announcements and provide access to the PowerPoint slides used in class. Students attend lab courses and clinical placements in hospitals or healthcare centres in their local communities. As noted earlier, this distance delivery model allows students to live and learn in their own communities and provides the home communities with greater retention of healthcare professionals.

A particular challenge associated with this multi-site delivery model is to provide consistent, high-quality lab courses and clinical experiences across the sites that meet the outcomes of the nursing program. In some of the regions, especially the smaller regional communities, difficulties such as minimal lab resources, continued use of part-time instructors, inconsistent content, communication problems between sites and instructors, feelings of disconnection to other campuses, and varying teacher expectations have led to students' dissatisfaction with lab classes as evidenced by comments on end-of-course and program evaluation forms. In addition, some rural hospitals have few or no opportunities for clinical placements, particularly in areas such as maternal-infant and surgical nursing (Morrison, Scarcello, Thibeault, & Walker, 2009).

As a result, it was proposed that a simulation-based practice lab should be designed and delivered in order to help meet these challenges and alleviate at least some

of the problems. The second semester course, *Nursing Practice II: Lab Theory & Practice* was chosen to include the simulation-based practice lab. The course description, as posted on the Confederation College (2011) website, is provided below.

> Nursing Practice II: Lab Theory & Practice. This course further explores the concept of health promotion and health protection with well individuals. The learner will gain the knowledge and the skills related to performing basic assessment and nursing skills required to care for the individual in selected age groups. Topics covered include the following: documentation; vital signs; maternal/infant care; newborn care; elimination; oxygen therapy; wound care; surgical asepsis; blood glucose monitoring; ostomy care; aggressive behaviour management; introduction to medication administration. (n.p.)

The design and delivery of the simulation-based practice lab occurred through the three-phase project described below.

Phase 1: The Workshop Project

In 2007, a project was conducted to examine how the use of human patient simulators and case study scenarios could supplement the learning process for distance students who faced limited lab and clinical opportunities in their rural communities. Human patient simulators and equipment from the main campus were transported to one of Confederation College's regional campus sites in order to provide a central location for the workshop where students could obtain simulated clinical experiences in obstetrical nursing. Fifteen nursing students from various regions attended the workshop. The project team set up four classrooms including a common classroom for discussion, demonstrations, and A/V presentations; two labs for practice with simulators; and a computer room for students to complete an online evaluation.

The three-hour workshop was designed to follow the entire maternal-child experience. Students were introduced to clinical scenarios by the use of case studies, group discussion, demonstration, and audiovisual aids. Following a brief orientation to

the human patient simulators, students were divided into groups of three or four. The groups then progressed through three scenario-based cases as they participated in a delivery; practiced assessment skills on an antepartum, postpartum, and post-Caesarean section mother; and conducted an assessment of the newborn. Feedback regarding workshop design and student satisfaction was obtained from students using an online survey.

Phase 2: The Pilot Project

Based on the success of the previous workshop, a pilot project was conducted in 2008. Human patient simulators and equipment were transported to the same campus site to provide a three-hour simulated obstetrical practice lab.

A total of 33 students in the first year of the practical nursing program across four campus sites attended the session. The learning environment included a common classroom for orientation and discussion, three labs for scenario-based practice with simulators, and a computer lab for students to complete online evaluations. Students were assigned to groups and rotated through the same three scenarios as the previous workshop.

Knowledge acquisition was measured using a 25-item pre-test and post-test. Results indicated that student participation in the clinical simulation workshop resulted in statistically significant knowledge gains (t (32) = -7.303, $p < 0.05$). After the simulation-based practice lab, participants also completed an online survey, which allowed for subjective responses. Three themes emerged from a qualitative analysis of the students' comments: (a) benefits of connecting with and meeting classmates, (b) limited time for the workshop, and (c) benefits of simulation (Morrison et al., 2009).

Recommendations for further research were made as a result of the pilot project. It was recommended that the National League for Nursing's (NLN) validated instruments, particularly the Educational Practice Scale for Simulation (EPSS) and the Simulation Design Scale (SDS), be should be used in future studies in order to evaluate the effectiveness of the teaching methodology and learning experience with more rigor and validity (Morrison et al., 2009). Previously the researchers had developed and used their own online survey for the workshop and the pilot study. It was also recommended that a more in-depth investigation be conducted to explore the sense of connectedness felt by the distance nursing students, and the impact that the simulation-based practice lab had on student learning. As such, the pilot project provided the foundation for the study reported in this doctoral dissertation.

Phase 3: The Research Study

This dissertation research was motivated by the need to develop quality teaching strategies using simulation in order to prepare distance nursing students for clinical practice. While simulation is one of the newest technologies used today in nursing education, further research is necessary to determine its effectiveness and guide its use. In a 2005 position paper, the NLN advised that nursing education should be research-based. Soon thereafter, the Nursing Education Simulation Framework was introduced and validated through the NLN/Laerdal Simulation Study with the goal of helping nurse educators conduct research on simulation-based learning in a systematic, organized manner (Jeffries & Rogers, 2007b). The Nursing Education Simulation Framework is composed of five components: (a) teacher factors, (b) student factors, (c) educational practices, (d) simulation design characteristics, and (e) expected outcomes. The design

and implementation of the simulation-based practice lab used in this research study was guided by the Nursing Education Simulation Framework, and the evaluative component of the framework was encompassed, in part, by this dissertation research.

Importance of the Study

Simulation-based practice is a creative teaching strategy that nurse educators can use to help students make the transition from theory to practice. Therefore, this research may encourage distance nurse educators to include simulation in the design of practice labs in order to better prepare students for clinical placements. Effective preparation is essential for nursing students to work in healthcare environments where greater patient acuity levels, staff shortages, and shorter patient stays are common and highly stressful, especially for beginning student practitioners.

A simulation-based practice lab can provide nursing students with opportunities to practice their skills, make mistakes, learn from those mistakes, and reflect on their practice and decision-making abilities in a safe, collaborative learning environment. Simulation-based practice helps beginning nursing practitioners develop confidence in their abilities to practice in the increasingly complex healthcare environment (Hovancsek, 2007).

In addition, in a multi-site distance nursing program, conducting an on-site simulation-based practice lab at a single campus site can standardize the way nursing students are prepared for clinical placements. In rural communities where limited and/or outdated lab resources and a shortage of clinical placements are common, simulation-based practice provides a means to introduce students to clinical experiences that they

may not be able to participate in otherwise, such as prenatal assessments, obstetrical deliveries, and/or care of surgical post-Caesarean section patients. Moreover, when clinical placement opportunities cannot be obtained, simulation-based practice labs can provide a semblance of the clinical experience for nursing students.

Studies on the use of human patient simulators and clinical scenarios in nursing education have focused on student and educator satisfaction, creative and effective teaching strategies, self-confidence, and the development of critical thinking skills (Bremner, Aduddell, Bennett, & Vangeest, 2006; Medley & Horne; 2005; Robertson, 2006; Smith & Roehrs, 2009). Further research has suggested additional positive outcomes when debriefing and collaboration have been incorporated into the simulation experience (Dreifuerst, 2009; Lasater, 2007; Moyer Childress, Jeffries, & Feken Dixon, 2007). However, none of these studies has addressed distance or blended nursing programs.

This study addresses this unexplored area. Using the Nursing Education Simulation Framework (Jeffries, 2007), this research investigates the instructional effectiveness of a simulation-based practice lab, namely how it affects knowledge and skill development, self-confidence, and learner satisfaction. It also studies the extent to which students feel a part of a learning community and examines how that sense of connectedness may be affected by the addition of the face-to-face collaborative group activities involved in the simulation-based practice lab. The results of this research may point to “best practices” in the use of simulation as a teaching strategy, and justify the incorporation of simulation-based practice into distance or blended nursing education

programs. In doing so, this research adds to the body of knowledge in distance and nursing education.

Purpose and Research Questions

The overall purpose of this study is to explore the effect that an on-site simulation-based practice lab would have on instructional effectiveness (i.e. knowledge, skill, learner satisfaction, and self-confidence) and community cohesion in a blended nursing program.

The Nursing Education Simulation Framework (Jeffries, 2007) and Rovai's (2002b) Classroom Community construct provided the conceptual bases for the study. The study addressed the following research questions:

1. What effect, if any, does participation in a simulation-based practice lab have on the following outcomes of instructional effectiveness as presented in the Nursing Education Simulation Framework (Jeffries, 2007): knowledge, skills, learner satisfaction, and self-confidence?
2. What effect, if any, does participation in a simulation-based practice lab have on sense of connectedness as measured by Rovai's (2002b) Classroom Community Scale (CCS)?

Limitations

Limitations identify potential weaknesses of the study (Creswell, 1994). This study involved a convenience sample of 42 students enrolled in the second semester of

their first year of a blended distance practical nursing program at a community college. The lack of random selection limits the generalizability of the study results.

Time constraints limited the amount of hands-on practice students had with the simulators and practice-based scenarios during the lab. Students worked in four-person teams using three scenario-based cases, with each student playing an assigned role. Every student assumed the role of the nurse in the newborn assessment scenario. However, in the birthing and post-partum assessment scenarios, only two members of each team played the role of the nurse and actually manipulated the simulator, while the other two students played the roles of family member and observer, then switched roles for the next scenario. While this strategy allowed each student to play the nurse, observer, and family roles, the actual hands-on experience with each simulation was limited. As such, the lack of hands-on practice may not have given each student sufficient time to engage in the activity and reinforce their learning.

Delimitations

Delimitations identify how the study was narrowed in its scope (Creswell, 1994). This study was confined to second semester students in a blended distance practical nursing diploma program. The investigation focused on the maternal-newborn content in the Nursing Practice II course and included participation in simulations of an obstetrical delivery, assessment of the newborn, and assessments of antepartum, postpartum, and post-Caesarean section mothers.

Definition of Terms

The terms, as defined below, are used throughout this dissertation**.**

Blended Learning: A flexible course design that includes a mixture of traditional, face-to-face, classroom-based learning and online or mediated learning. Blended learning offers the advantages of online learning with 24/7 access and flexibility in time and place for learning, with the benefits of face-to-face, classroom-based instruction, such as opportunities for real-time demonstrations, behavioural modelling (especially for psychomotor learning), socialization, greater intimacy, and less transactional distance.

Classroom Community: Corresponds to the sense of community experienced among participants within the educational setting (Rovai, 2002a). A classroom community is represented by feelings of connectedness and shared learning experiences (Rovai, 2002b).

Collaborative Learning: Within the context of a simulated clinical experience, collaborative learning is an instructional method that allows nursing students to work together in a team in order to gain knowledge and skills that will prepare them to improve patient outcomes in a clinical setting (Moyer Childress et al., 2007).

Community Cohesion: Corresponds to the strength of members' feelings of belonging to a group or their sense of community (McMillan & Chavis, 1986). A cohesive community has an element of spirit that comes from members' enjoyment of time spent together, trust as they rely on each other, interaction that leads to knowledge construction, and common expectations that their educational goals will be met through participation (Rovai, 2002a).

Debriefing: Within the context of a simulated clinical experience, an event occurring immediately after the simulation experience when a facilitator/educator and students get together for a process in which they examine what occurred and what was learned. Debriefing gives the students an opportunity to evaluate their actions, decisions, and communication. The facilitator/educator guides the session to keep the discussion focused on the simulation objectives and outcomes (Jeffries & Rogers, 2007b).

Experiential Learning: A view of learning that combines experience, awareness, cognition, and action. It is the process of creating meaning through reflection upon direct experience (Kolb, 1984).

Fidelity: A term used to describe the accuracy of a simulation system (Seropian, Brown, Samuelson Gavilanes, & Driggers, 2004), or the degree to which both a simulator and simulation scenario represent reality (Jeffries & Rogers, 2007b). Seropian et al. (2004) identify three categories of fidelity: low, moderate, and high. Low-fidelity simulators lack detail and realism (e.g., a foam intramuscular injection simulator). Moderate-fidelity simulators offer more detail and realism, including features such as breath sounds, heart sounds and a palpable pulse, but lack chest movement. Moderate-fidelity simulators are used for increasingly complex competencies (e.g., Resusci-Anne used to teach CPR). High-fidelity simulators present students with a mannequin that more closely represents a human patient and has a high level of detail and realism (e.g., the chest rises and falls, the simulator can be programmed to speak).

Human Patient Simulator (HPS): A life-sized adult or child mannequin with a highly developed computer interface that allows healthcare students or practitioners to

experience patient scenarios in different pathologies and respond realistically to a variety of treatments (Bremner et al., 2006).

Simulation: Within the context of nursing education, a teaching method that provides a complete or partial aspect of a reality-based clinical situation. On a continuum from low- to high-fidelity, simulation experiences range from the use of case studies, role-playing, task trainers, low-technology mannequin and computer-based simulations, to full-scale patient simulators that provide a higher level of interaction and realism (Hovancsek, 2007).

Summary

In the face of a continually changing healthcare system and continuous nursing shortages, distance nursing programs have emerged as an effective way of preparing nurses for practice. Distance programs have particular advantages for rural and remote communities as they allow students to remain in the home communities during their studies and be more likely to be retained there after graduation.

Blended distance nursing programs typically use technology-mediated courses (e.g., web-based and/or via video conferencing) to deliver the theory part of the program, with community-based practicum or clinical practice in hospitals or health facilities to provide the more practical, applied, and hands-on components. However, the transition from theory to practice can be difficult, and students often lack skills, knowledge, and confidence as they begin the practical part of their programs. The use of simulation-based practice labs are a promising way of helping students become better prepared for clinical practice, and can even provide a

substitute when clinical placements are not available or possible. However, research on the use of simulation in distance nursing programs is limited. This research study helps to fill this gap and contributes to the growing body of knowledge regarding the use of scenario-based simulated practice in nursing education.

Organization of the Dissertation

Chapter 2 describes relevant literature related to this study. It provides an overview of the theoretical framework and a review of the literature on distance education and nursing, blended learning, simulation, learning communities, and instructional effectiven**e**ss. Chapter 3 describes the research design, methodology, procedures, instrumentation, and data analysis of the study. Chapter 4 provides the findings of the quantitative and qualitative data analysis, as well as a discussion of the study results. Chapter 5 contains the conclusions of the study related to instructional effectiveness, community cohesion, knowledge and skill development, self-confidence, and learner satisfaction. It also includes recommendations for improvements to the simulation-based practice lab, as well as suggestions for future research.

CHAPTER 2

REVIEW OF THE LITERATURE

This chapter provides an overview of the literature and research related to the study. It begins with a discussion of the challenges of delivering a nursing program by distance education, and the opportunities that a blended learning environment can provide. The design of simulation-based practice labs as a strategy for improving the effectiveness of distance nursing programs is also presented. In the final section of this chapter, instructional effectiveness and community cohesion are discussed, particularly the Nursing Education Simulation Framework (Jeffries, 2007) and Rovai's (2002b) Classroom Community construct, which provide the conceptual bases that guided this research study. The chapter concludes by discussing findings or gaps in the research that provided the foundation for this study.

Distance Education and Nursing

The history of distance nursing education began in 1956, when a psychiatric nursing course was provided by the University of Nebraska for the first time using an audio conferencing system (Cooper, 1983). From stand-alone courses to full-time programs, distance nursing education has evolved as a means to meet the needs of widely dispersed as well as diverse student populations, competitive education markets, continuing education, and healthcare systems facing nursing shortages (Hyde & Murray, 2005; Mancuso-Murphy, 2007; Ramsey & Clark, 2009; Reinert & Fryback, 1997). Reinert and Fryback (1997) noted that despite the increase in

distance learning, there was limited research into the amount and type of distance nursing programs offered. Their descriptive study sought to examine the use of distance programs offered by nursing schools in the United States in the mid-1990s. The results of their survey indicated that the number of distance nursing programs was growing. Theoretical sampling was used to select staff in charge of distance learning programs at seven schools in order to collect further qualitative data. The type of distance learning media used varied among schools, and included "correspondence classes, audio and video tapes, satellite television, cable television, computers, teleconferencing, interactive and compressed video, and faculty travel" (Reinert & Fryback, 1997, p. 424). The findings of this study identified common needs across faculty and students. Faculty issues focused on (a) comfort with new technologies, (b) difficulty adapting to new teaching methods or lack of technical support, (c) insufficient preparation or development time allotted on workload forms, and (d) lack of professional socialization interaction opportunities. Student issues focused on (a) consistency and direction in course structure, (b) interaction with faculty, and (c) lack of connectedness with the school or other students. Consequently, Reinert and Fryback (1997) concluded that distance learning programs needed to be planned carefully, and that nursing schools should find "creative ways to stimulate learning" (p. 426).

Researchers over the last few decades have built upon earlier studies and sought to explore nursing students' experiences with online or web-based education in hopes of identifying effective teaching and learning practices. While distance education can be an effective way to reach more students, not all experiences are positive.

Sit et al. (2005) examined the experiences of nursing students in part-time online (WebCT-based) courses (n = 305). In their literature review, the authors discussed the application, advantages, and challenges of online learning in comparison to traditional classroom teaching. They relied on the 2004 Flashlight Project of the American Association of Higher Education which "provided a framework and Current Student Inventory (CSI) tool kit for assessing students' views of technology-based teaching and learning as well as benchmarking good practices in educational uses of technology" (p. 141). Sit et al. (2005) developed an online questionnaire based on the CSI and the results of preliminary focus group interviews. Their research found student satisfaction with online learning to be slightly positive. The overall satisfaction rate was 56.7% with 161 respondents "Satisfied" and 12 respondents "Very Satisfied." Specific reports of satisfaction were related to flexibility in learning and course structure, delivery, and content. In regards to human interaction, however, the students complained of a sense of loneliness in spite of the opportunities for online discussion forums, emails, and chat rooms. They valued the face-to-face tutorial sessions where they were able to meet their study group members face-to-face rather than online. In their conclusion, Sit et al. (2005) noted that online classes with blended supplemental on-site classroom meetings could improve socialization and support for both students and instructors.

Hyde and Murray (2005) examined the experiences of nurses in distance education programs in the Republic of Ireland. Qualitative interviews were conducted with 15 student nurses who had completed a variety of higher education distance programs, most involving the use of pre-packaged print course materials. The majority of students expressed satisfaction with the circumscribed content and

design; however, there were some mixed feelings. One student felt the pre-packaged study packages were limiting as additional readings were not encouraged, while another felt there was not enough time to complete the course material as it was presented. Generally, most participants in the study felt the course design was comprehensive and efficient enough for the course timelines. Some students expressed a sense of remoteness from their fellow students, a lack of support, and restricted opportunities for engagement. Hyde and Murray (2005) cited the earlier work of Habermas (1984, 1987) and suggested that the lack of opportunity for verbal communication was central to an individual's transformative potential. The authors noted that "within the isolation of a DE programme, the scope for collective critical learning is potentially diminished by the lack of interactive learning, and participation in discourses" (Hyde & Murray, 2005, pp. 92-93). They advised that understanding distance education and how it is accepted by students will help nursing schools strengthen their programs. As technology evolves, nurse educators should develop distance programs that take advantage of the possibilities.

Mancuso-Murphy (2007) began her article by asking the question, "What are nursing students' experiences and perceptions of distance education?" (p. 252). She suggested that the answer would assist nurse educators to develop teaching and learning strategies that met the needs of their students, and in doing so, potentially shape the quality of distance education programs. Mancuso-Murphy (2007) provided an integrative review of the nursing literature, examining the distance education experience from the student's point of view. The analysis of 12 research studies and two doctoral dissertations revealed that while all students identified "convenience, accessibility, and

flexibility as positive aspects of distance education… communication, interaction, faculty, and feedback were also important" (Mancuso-Murphy, 2007, p. 256). A facilitative environment that established support and communication were also identified as essential. She noted that interaction was as important as communication in distance education classroom. In an online distance environment, interaction was about group dynamics and sharing information across sites. Therefore, distance nursing educators should identify and develop innovative and creative strategies that promoted communication, interaction, and active learning. In her recommendations for future research, Mancuso-Murphy (2007) suggested that "continued research is also needed to identify the best teaching and learning practices in distance education, as studies show strong correlations between educational practices and the outcomes of satisfaction, connectedness, and socialization" (p. 259).

Blended Learning

As the literature reviewed above indicates, lack of connectedness and feelings of isolation and loneliness are common shortcomings of distance nursing programs as they are of most distance programs. Blended or hybrid learning environments have been suggested to overcome these shortcomings, as blended courses have been found to create a stronger sense of community than either online courses or traditional face-to-face courses (Rovai & Jordon, 2004). Blended learning involves a combination of face-to-face classroom-based and web-based (or otherwise mediated) learning experiences (Kliger & Pfeiffer, 2011).

In Rovai and Jordon's (2004) study, students enrolled in traditional face-to-face (n = 24), blended (n = 23), and fully online (n = 21) courses completed Rovai's (2002) CCS during the second week (pre-test) and the second last week (post-test) of the semester. Using a casual-comparative design to determine the mean differences in all three types of courses, the blended course presented the highest mean connectedness sub-score (CCS [connectedness] = 34.91) and the highest mean learning sub-score (CCS [learning] = 36.17). (Each sub-score was out of a possible 40 points.) In the end-of-course evaluations, all student comments regarding the blended course were positive. Rovai and Jordon (2004) concluded that blending learning environments produce learning, reach students through distance education technology, and promote a strong sense of community.

Gilmore and Lyons (2012) described the implementation and evaluation of a face-to-face orientation session held at the start of a newly developed online RN to BSN program that had been delivered on weekends for three years. During the first year of the online program (2007), 102 RNs attended a four-hour face-to-face orientation session that reviewed student support, technology, and learning services, the registration process, university and program policies, and faculty introductions. Evaluation results showed only 77.6% of the students were satisfied with the orientation; there was an attrition rate of 20% for this class. The orientation session in 2008 was increased to eight hours and added activities related to practice with computers and navigating online courses. The session was attended by 47 RNs. Evaluation results for that year revealed that the satisfaction rate increased to 94.6%; the attrition rate for this class was 2%. The third and final orientation session in 2009 used the same eight-hour face-to-face format and was

attended by 30 RN students. The results of the evaluation that year showed 98.2% satisfaction with the program orientation. The attrition rate for this class was less than 1%. Gilmore and Lyons (2012) concluded that the face-to-face orientation was effective in increasing student satisfaction and decreasing attrition rates for the online nursing program. They noted that the face-to-face nature of the orientation session allowed students to be interactive and obtain support from each other, as well as faculty, and that the orientation enhanced the transition into the virtual learning environment.

Blended learning can create an ideal learning environment for students. Ramsey and Clark (2009) advise that a blended delivery approach to distance learning can enrich the learning environment. Multiple delivery media such as web-based course platform systems, social networking sites, and collaboration software are some of the tools that can be used in blended learning (Kliger & Pfeiffer, 2011). Faculty can supplement a traditional course with synchronous and/or asynchronous online components that house course materials, assignments, discussion boards, and links to the Internet. Web-based instruction bridges time and distance and can facilitate student interaction and collaboration (Ramsey & Clark, 2009). Moreover, the more flexible blended approach offers the convenience of online delivery without losing the positive effects of face-to-face contact. This blending of time and distance, as well as the convenience of an online course without the loss of face-to-face contact, potentially creates a more robust educational experience then a completely traditional or online course (Rovai & Jordon, 2004).

New uses of instructional technology in the blended learning environment can support student-centered learning. Garrison and Kanuka (2004) advise educators to

carefully assess the resources used to create and maintain effective blended learning environments. They suggest that to ensure the technology used in blended learning environments enhances the learning process, technical resources must be "dependable and transparent" (p. 101). To help meet the learning needs of students, course resources must be up-to-date, reliable, and easy to use. Technology can also improve communication and facilitate interactions. According to Dow (2008), transparency promotes engagement for students in the learning process. She suggests that students have to work at engaging with other students in an online environment because the social context is not available. The lack of non-verbal cues or social expressions can create misunderstanding or frustrations that affect student learning. When educators create opportunity for instant and clear feedback, they promote social presence cues and enhance the learning environment (Shaw, Chen, Harris, & Huang, 2009). Distance educators can create that sense of immediacy or instant feedback and promote social cues in a blended classroom by using digital web cameras or video conferencing systems.

Video Conferencing

The program in this research study is different from most blended distance programs in that it is based on point-to-point video conferencing. Billings and Halstead (2009) describe video conferencing as "live face to face conferencing between two or more participants at various locations with digitally transmitted audio and video components over data networks" (p. 360). Point-to-point video conferencing allows the subject matter to be broadcast from a central point to many different points (locations)

regardless of the geographical distance. While students are separated geographically from each other, either as an individual or as a site, video conferencing connects them in a real-time, synchronous, visual and auditory manner (Gillies, 2008).

Video conferencing provides the opportunity for synchronous two-way communication between the teacher and the learners and among learners. It allows for video demonstrations, student presentations, and even group work. Students can study at home or in a nearby facility. Not only can the teacher and students hear and see one another in the video conferencing classroom, but the technology also conveys non-verbal cues and allows documents to be viewed, instructional media to be presented, and computer-based presentations to be made (Billings & Halstead, 2009).

Video conferencing can bring resources such as guest speakers into the classroom and expand the classroom walls to other schools or even other countries. Martin (2005) noted that video conferencing has the potential to enrich the teaching and learning environment. In a 2005 research paper, she presented several case studies of innovative educational programs in Northern Ireland between 1996 and 2002 in order to demonstrate the flexibility of video conferencing in different curricular areas, age groups, and student learning styles. The case studies showed the potential for video conferencing to enrich the distance learning experience to the benefit of learning communities. For example, one study entitled the “Virtual Shared Classroom” project linked post-primary students in two schools in New Jersey. The project supported collaborative learning, and students felt they belonged to a larger community of learners. Students researched their topics on the Internet prior to their weekly videoconferences. The two classes became one as students shared their findings in presentations by email with their virtual classmates. The teachers

also shared their knowledge and expertise, further enriching the learning experience for the students. A second example called "The Global Leap" Project enabled United Kingdom students during an annual one-day event to "leap" around the world and participate in lessons in other countries via video conferencing. The purpose of the event was to show what video conferencing could do and encourage schools to use it more often in their classrooms.

Zerr and Pulcher's (2008) pilot research study looked at the benefits of using video conferencing to connect external assessors and graduating senior student nurses for a Senior Nurse Leadership Assessment Day. Students and assessors were located in two remote sites, 50 miles apart from each other. Prior to the pilot project, the university recruited volunteer external nurse assessors who were required to travel to the day-long event. In the pilot project, the students and the assessors interacted entirely through video conferencing. Technical support personnel were available to resolve any technical issues. A small convenience sample consisting of four graduating senior nursing students was presented with five patient scenarios with specific patient information and a medical plan of care. The scenarios were nurse leader activities that would typically be encountered by a professional nurse in an in-patient hospital setting. Four volunteer RN external assessors asked predetermined assessment questions. The results of the study demonstrated that video conferencing was a successful method of evaluating students at a distance. All of the students agreed or strongly agreed that the learning experience was enhanced by the use of the video conferencing format and that they supported the continued use of video conferencing for the event. The students and faculty were satisfied with the interactive experience, and felt it promoted "discussion, learning,

assessment, and validation of program outcomes" (Zerr & Pulcher, 2008, p. 91). In addition, video conferencing allowed the students and the assessors to remain in their own communities and avoid the expense, time, and energy commitment of travelling between sites.

Simulation-Based Practice Labs

While video conferencing has the potential to create distance learning environments that emulate a traditional classroom and enhance learner-learner, learner-content, and learner-instructor interactions (Peterson, 2004), it does not provide the hands-on opportunities necessary for nursing students to develop their clinical nursing skills. On-site clinical placements are commonly used to provide these learning opportunities. However, bridging from theory to practice can be difficult. As a result, nurse educators need to provide practice opportunities for their students to develop their clinical nursing skills in a safe, supported learning environment prior to a clinical practicum. This dissertation research study used a simulation-based practice lab to provide such a learning environment.

By definition, simulations resemble reality. In health education, simulations attempt to "replicate 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). Examining the history of simulation can help to provide a framework for understanding the operation and purpose of simulation-based practice labs in nursing education.

The History of Simulation

The military, aviation industry, and health care sector all have a history in the use of mechanical simulators for educational purposes. Simulators were initially used in the training of military personnel, beginning in World War I, when wooden mechanical horse simulators were used to prepare troops for fighting on horseback. Simulators have also been used for training aviation and marine pilots. The first flight simulator was developed by Edwin Link in 1929 and was standard equipment for air training schools during World War II (Harris, 2009).

The use of simulators in modern healthcare education came into being in the 1960s with the introduction of *Resusci® Anne*, a resuscitation trainer used in cardio-pulmonary resuscitation (CPR) training. This full-body mannequin had mechanical components that allowed the chest to move when doing respirations and chest compressions. In the 1980s, health educators developed a simulator model to train physicians in anaesthesia administration. The model was designed by studying military and aviation training simulations of individuals or teams during critical events.

From task trainers to simulators, the computer revolutionized the use of simulation by creating rich, multi-media virtual environments like the *Virtual Human Project*. The *Virtual Human* was a computer model that simulated the function and structure of the human body (Oak Ridge National Laboratory Virtual Human Project, 1996). The early use of computers in simulations involved mainframe or mini-computers, such as the PLATO system; however, the dependence on these stationary large scale computers began to disappear in the 1980s, with the advent of personal computing and the personal computer. In the 1990s, the development of the human patient simulators

transformed healthcare education. These simulator models were affordable, portable, and versatile, and became the technology to use for competency testing and continuing education (Hovancsek, 2007). As computer technology advanced, so too did computerized simulations. Today, high fidelity simulators and simulations are common in many disciplines.

In relation to simulation, *fidelity* describes the accuracy or realism of the system being used (Seropian, Brown, Samuelson Gavilanes, & Driggers, 2004). Simulators can be considered on a continuum; the higher the fidelity, the closer the simulator is to what would be encountered in real life. Simulators are divided into three categories: low, moderate, and high fidelity. Table 2 presents examples and includes approximate costs of each type.

Low-fidelity simulators are often static, lacking the detail or realism that would help students translate that practice into the real-life hospital experience. Low-fidelity simulators or task trainers, such as foam intramuscular injection simulators, are useful for introducing and practicing the technical aspect of psychomotor skills, but not the interpersonal component of these skills (Seropian et al., 2004).

Table 2

Levels of Simulator Fidelity

	Low-Fidelity Simulators	Moderate-Fidelity Simulators	High-Fidelity Simulators
Examples	• Resusci-Anne® • Male and Female Catherization Models • Wound Care Models	• VitalSim® Nursing Annie • Noelle® Maternal Neonatal Birthing Simulator	• SimMan® • SimMan- 3G® • SimBaby™
Costs	Basic CPR Mannequin $160 Catheterization and Enema Task Trainer Pelvis $650 IV Skill Practice Arm $700	Mega Code Kelly $12,000 Noelle® Maternal Neonatal Birthing Simulator costs between $3,500 for basic to $17,000 for advanced model	Expensive: Costs range from $28,000 to more than $150,000. Need to consider additional operating costs such as training, warranty, and replacement parts.

Source. M. Seropian et al. (2004). Simulation: Not Just a Manikin. *Journal of Nursing Education, 43*(4), 165, and Laerdal Medical Canada. (2010). *Home page*. Retrieved from www.laerdal.ca

Moderate-fidelity simulators are more realistic than low-fidelity simulators and provide nurse educators with tools to help students develop their understanding of subject matter as well as skill competence. Using moderate-fidelity simulators, nursing students can take pulse rates, measure blood pressures, and assess heart, lung, and bowel sounds. Pulses rates and blood pressure measurements can be adjusted to create a variety of realistic scenarios (Seropian et al., 2004). The Noelle® Maternal Neonatal Birthing Simulator used in this dissertation research study is considered a moderate-fidelity simulator. Students can practice Leopold Manoeuvres to determine the position of the fetus and listen to fetal heart sounds. They can even observe the birthing process; with the flip of a control switch, the baby mechanically descends into the birth canal.

High-fidelity simulators have high levels of realism; they can be programmed to breathe, talk, cry, have seizures, and even blink. They are designed to look real (cosmetic fidelity) and can be controlled to react in realistic ways (response fidelity) to nursing students' interventions. High-fidelity simulators can help students perceive that the scenarios they are experiencing are real (Seropian et al., 2004).

Simulation in Nursing Education

Traditionally, nurse educators believed that guiding students to apply theory to clinical practice would lead them to become safe and competent graduates. Skills laboratories were constructed and equipped to help nursing students apply the theory taught in the classroom in a safe, practice environment prior to clinical placements. While these skills laboratories were effective, they lacked the context and the realism of the health care environment. In contrast, simulation-based practice labs have been found to result in greater readiness. For example, Hovancsek (2007) noted that participation in simulations throughout the program enhanced the preparation of student nurses for clinical placement.

A simulation-based practice lab provides a safe environment in which students can give care, make mistakes, and learn from those mistakes. This environment not only helps students develop their skill performance, but also their confidence, so they are better prepared when they approach real patients and perform those skills in the clinical setting (Hovancsek, 2007).

Simulation-based practice labs may include a range of simulators and activities. For example, simulation can support learning for beginning students with the use of low- to moderate-fidelity simulators which allow students to practice skills

such as head-to-toe assessments, vital signs, and dressings. As nursing students progress through their programs, they can participate in simulation experiences using high-fidelity simulators to develop their decision making and more complex skills and prepare for clinical placement. High-fidelity simulators can be programmed to show the transition from normal to abnormal changes in blood pressure, pulses, and breath sounds (Rauen, 2001). They can simulate a respiratory or a cardiac arrest. As such, students can practice and demonstrate patient care at more advanced levels, learning how to establish assessment skills, set priorities, and think critically based on their learning experiences, observations, and advice from facilitators (Hovancsek, 2007). Designing simulations for nursing students is an effective strategy for applying theory to practice, promoting critical-thinking and building skills in a safe, facilitated learning environment (Weis & Guyton-Simmons, 1998).

Advantages and challenges of using simulation in nursing education. Greater patient acuity and advances in patient care technology (such as external defibrillators, ventilators, and infusion pumps) have created new needs for simulation in nursing education as well as new challenges for nurse educators to help students become better prepared for clinical practice. It is important for nurse educators be aware of the benefits and challenges of incorporating simulation in nursing education.

Moyer Childress et al.'s chapter titled "Using Collaboration to Enhance the Effectiveness of Simulated Learning in Nursing Education" in Jeffries (2007) edited book, *Simulation in Nursing Education*, explored how simulation can benefit collaborative learning. They noted that a simulated healthcare setting can provide an

ideal, active learning environment that is safe, engaging, and realistic, and outlined how activities may be designed as follows:

> Health care simulation scenarios (e.g., mock codes or resuscitation events) can be developed to allow students to work in teams. When functioning in a group, students collectively work together to solve problems and provide care during the simulated experience. During the group experience, students also have the opportunity to support each other during stressful situations. In this collaborative learning experience, students can reflect and analyze together what worked effectively and share ideas about areas where improvement may be necessary. Working in groups helps students learn from each other as well as develop and hone decision-making and critical thinking skills. (p. 131)

In another chapter, Hovancsek (2007) recommended that nursing students be able to practice their skills and develop confidence before giving care in a clinical setting, as the clinical environment can be stressful for nursing students because patient acuity levels are higher and staff shortages are significant. Simulation is an ideal way to provide such practice, as it not only provides students with the opportunity to make mistakes in a safe, supportive environment, but allows them to repeat the task after self-reflection or feedback until they can perform it without errors and with confidence, thus enhancing their skill development.

Active learning is an important aspect of simulation. Jeffries (2005) notes that simulation provides an active learning environment in which nurse educators can help their students make "connections between and among concepts and [that] engage(s) students in the learning process" (p. 99). The author included active learning as an element in the Simulation Model, which originated from the NLN/Laerdal study, a precursor to the Nursing Simulation Framework (Jeffries, 2007). The inclusion of this element stems from earlier research on simulation as a teaching strategy. Johnson, Zerwic, and Theis (1999) found that students retained knowledge longer when involved

in active learning. In the learning activities, students came to the simulation experience with previous knowledge and skills, and then, within the framework of a simulation scenario provided by the facilitator, worked collaboratively with their peers to direct the care given to the patient. Once the exercise was completed, the students and facilitator discussed the experience. The researchers concluded that the opportunity for immediate feedback helped students to process the learning further and transfer it into long-term memory, resulting in greater retention of knowledge and skills (Johnson et al., 1999).

Yet another advantage of simulation in nursing education is that it allows nurse educators to provide a clinical experience that a student may not have the opportunity to encounter otherwise (Hovancsek, 2007). For example, rural community hospitals may not have as many maternity beds as larger urban-based hospitals. Opportunities to see a live birth, care for a newborn, or provide post-operative care after a Caesarean section are limited. Simulation allows the nurse educator to present a range of simple to complex situations for learners in a controlled environment.

In a similar vein, Morrison, Scarcello, Thibeault, and Walker (2009) identified the lack of clinical placement opportunities in student nurses' home communities as a challenge of distance nursing programs. They noted that competition for clinical placement existed from other programs, and that smaller communities tended to have fewer opportunities for clinical placements, especially in specialized areas such as Maternal/Infant and Surgical units. To address these difficulties, they brought 33 nursing students together at one of the four regional campuses for a learning experience using human patient simulators in clinical scenarios. Simulators were transported to one site and three obstetrical labs were set up in classrooms for practice as students rotated

through each station. The researchers developed their own assessment instruments, clinical scenarios, and online evaluation survey. Results of a pre- and post-knowledge test showed a statistically significant gain in knowledge (t (32) = -7.303, $p < 0.05$). Analysis of student responses in an online survey revealed three themes: (a) benefits of connecting with and meeting their distance classmates, (b) limited time for the workshop, and (c) benefits of simulation. Their final recommendations included further exploration of the effectiveness of bringing distance students together for simulation-based practice labs incorporating clinical simulation and the use of the EPSS and SDS instruments in future studies.

The benefits described above provide a foundation on which to provide students with a simulation-based practice lab experiences to increase their preparedness for clinical practice; however, there are barriers and limitations as well. The challenges of using simulation as a teaching strategy in nursing education include increased faculty preparation time, expense, and requirements for physical space (Hovancsek, 2007). Effective simulations take time and dedicated faculty assigned to the development and implementation of simulation scenarios. Faculty must be oriented to the operation and programming of the simulators, or technical staff may be required for these operations. There are costs involved with purchasing, operating, and maintaining the simulators.

Learning Theories and Simulation

A variety of learning theories support the use of simulation in nursing education. Rodgers (2007) identified how the following theories/models may explain the effectiveness of simulation:

- *Adult Learning Theory* is based on the premise adults are goal- and relevancy oriented, as well as self-motivated.
- *Constructivism* supports the principle the learner has an active role in reformatting knowledge based on new experiences.
- *Experiential Learning Theory* embraces the concept of practice and feedback. Students learn from experience and develop practical and critical thinking skills through reflection.
- *The Novice-to-Expert Continuum* describes the acquisition of knowledge and skills based on an accruing experience.
- *Brain-based Learning* may relate to how students integrate new information into existing knowledge, and involves as many learner senses as possible.
- *Social-cognitive Learning Theory* may support the importance of interactive learning.

Moyer Childress et al. (2007) note that the application of new knowledge and skills may be better accomplished in a collaborative environment in which students can interact and share their knowledge and skills in a realistic manner. They contend that the use of a collaborative learning philosophy in a simulation-based practice lab environment holds "extraordinary promise" for the education of nurses.

Collaborative Learning and Simulation

In a collaborative learning environment, students share responsibility for learning, and in doing so, "the success of each student enhances the success of the others" (Moisey, Neu, & Cleveland-Innes, 2008, p. 19). Within the context of simulations in a clinical learning environment, collaborative learning is defined as "the process of individuals functioning together as a group for the purpose of acquiring knowledge and skills to improve patient outcomes" (Moyer Childress et al., 2007, p. 124).

The origins of collaborative learning are often tied to Johnson and Johnson (1984), who noted that students working in cooperative groups developed higher levels of thought, discovered higher-level strategies, and gained a greater understanding of subject matter than students in individual or competitive learning

situations. In a cooperative learning environment, students look for outcomes that are beneficial to everyone in the group: they discuss the material with each other, help each other understand it, and encourage one another to work hard (Johnson & Johnson, 1984). Johnson, Maruyama, Johnson, and Nelson (1981) reviewed 122 studies from 1924 to 1981 and compared the effectiveness of cooperative, competitive, and individualistic learning. Their findings indicated that cooperative learning resulted in higher achievement and greater retention of learning.

Moyer Childress et al. (2007) reviewed these earlier findings and linked cooperative learning experiences to the opportunities that simulated experiences can provide. They noted that "incorporating collaborative learning experiences in simulation can provide students with an opportunity to enhance their critical thinking through inclusion of problem-solving situations," and went on to propose that a simulation-based practice lab can provide an "ideal active-learning environment that is safe, engaging, and realistic" (p. 131). Through collaborative learning, students in a simulation-based practice lab work together as a team applying classroom theory to simulated clinical scenarios and solving problems through discourse and reflection. The team members in a simulation-based practice lab have opportunities to learn from each other through conversation, observation, and collaboration.

Experiential Learning Theory and Simulation

Many researchers (e.g., Andresen, Boud, & Cohen, 2000; Moon, 2004) have recognized the contribution of Kolb (1984) in establishing the theoretical foundation for much of the experiential education today. Using the term *experience-based learning*, a synonym for experiential learning, Andresen et al. (2000) defined the construct as "a

holistic, integrative perspective on learning that combines experience, perception, cognition and action" (p. 230), and proposed three characteristics that distinguished experience-based learning from other approaches: "involvement of the whole person; recognition and active use of all the learner's relevant life experiences and learning experiences; and continued reflection upon earlier experiences in order to add to and transform them into deeper understanding" (pp. 225-226). In addition to the characteristics and possible approaches, Andresen et al. (2000) identified the following as essential criteria for experience-based-learning:

- The learning is personally significant or meaningful to the learner.
- The learner is personally engaged with the learning.
- The learning involves the whole person and all the characteristics of a functioning human being.
- The learner brings informal and formal prior learning experiences.
- The teachers, trainers, leaders, or facilitators bring an ethical stance of concern and respect which value and respect the self-directed potential of the learner.
- The learning employs essential stages of debriefing and reflective thought. (pp. 226-227)

From the perspective of simulation as a teaching strategy, involvement of the whole person suggests that learning takes place within a combination of cognitive, affective, and sensory experiences, such as that provided in role-playing or simulation games. By relating the new learning to the learner's personal life experiences, the new learning becomes meaningful as it is successfully integrated with the learner's prior skills and knowledge, and is further enhanced by continued reflective thoughts. Within simulation-based learning, the debriefing phase is a particularly important process "designed to synergize, strengthen, and transfer learning from an experiential learning exercise" (Warrick, Hunsaker, Cook, & Altman, 1979, p. 91).

The roots of reflection or reflective thought are commonly identified as stemming from the work of Dewey (1933), Schön (1983), and Kolb (1984). Dewey (1933) looked at reflection as an active, exact, and emotional process that encourages learning by taking new knowledge and building on past experiences. Schön (1983) identified two types of reflection: reflection-in-action and reflection-on-action. *Reflection-in-action* is the evaluation of self during an experience. *Reflection-on-action* is the evaluation of an experience after it is done. In analyzing the experience, the student can gain new understandings in the hope of applying that new knowledge to future situations. Kolb (1984) suggests that reflection is a part of the cycle of experiential learning, which incorporates real-life experiences, self-reflection, and a search for patterns, as well as the development of new understandings. Drawing on these theorists, Decker (2007) argues that reflection is an important part of experiential learning and leads to the development of new knowledge that can be used in future situations.

Schön (1987) recommended the use of a reflective practicum to facilitate the development of reflective thinking. A reflective practicum is a real-life experience designed by faculty to promote professional skill. Decker (2007) observed that the reflection element in Jeffries' (2005) Simulation Model is very similar to this reflective practicum in that debriefing reinforces the learning experience and encourages reflective thinking. This process encourages students to link theory to research and practice, critical thinking, and nursing interventions in complex situations. At the end of the simulation and guided by the facilitator, the group

discusses what occurred during the simulation exercise, what they learned, and how they can apply the scenario to their clinical practice.

The simulation-based practice lab involved in this research study used collaborative and experiential learning activities to provide opportunities for nursing students to gain knowledge, skills, and confidence in their ability to provide care to patients. Debriefing provided a means for students to reflect upon their learning and to consider how to incorporate the new skills and knowledge into their clinical practice.

Theoretical Frameworks

Although the use of simulation in nursing programs has flourished in the last decade, it is still early in its development as a teaching strategy and further research is needed to validate its effectiveness (Hovancsek, 2007). In addition, there is little research on the use of simulation-based practice labs in distance nursing programs. Jeffries (2007) notes the need for an empirically-supported framework to guide the design, implementation and evaluation of simulation in nursing education as well as to help nurse educators conduct research studies in a consistent, organized fashion.

As the focus of this dissertation research involved the investigation of instructional effectiveness and community cohesion associated with a simulation-based practice lab in a distance nursing program, two frameworks were chosen to guide this research study. The Nursing Education Simulation Framework (Jeffries, 2007) was considered an appropriate model to adopt as a theoretical framework to guide the design and implementation of the simulation-based practice lab, as well as to guide the study itself and explore the instructional effectiveness of the simulation in an organized,

systematic manner. The construct of community cohesion was also selected as distance teaching and learning activities should promote a sense of community among students. Rovai's (2002a) CCS was used for determining the impact of a simulation-based practice lab on community cohesion. The two frameworks chosen to guide this research study are discussed further below.

The Nursing Education Simulation Framework

The Nursing Education Simulation Framework (Jeffries, 2007) evolved from the Simulation Model (Jeffries, 2005), which was developed for and originally tested through the NLN/Laerdal Simulation Study. Acknowledging the potential of simulation as a promising teaching strategy for nursing education, a joint project between the NLN and the Laerdal Corporation began in June, 2003. The three-year project had four purposes:

- to develop models that would guide the use of simulation in the promotion of student learning,
- to develop a core group of nurse educators who could use simulation in creative ways to enhance student learning,
- to contribute to the body of knowledge in the use of simulation in nursing education, and
- to show the value of education and corporate partnerships.

The project resulted in a Simulation Model to guide nurse educators in the design, implementation, and evaluation of simulations in nursing programs (Jeffries, 2005). Eight school project sites were involved in the study. The four-phase project began with a comprehensive literature review to identify gaps in the simulation literature. In Phase II of the project, medical-surgical simulations were created. A small study was conducted at each site to investigate the elements and processes involved in the simulations. The simulation equipment used at the sites varied: six schools used a SimMan®, one school used a low-fidelity mannequin, and one site used an IV simulator. However the same

data collection instruments were used in all eight schools: the SDS and the Educational Practices in Simulation Scale. Data analysis from Phase II revealed that the most important simulation design feature was feedback/debriefing, while the most important educational practice was collaboration.

Phase III of the study had two parts. As all schools in the project taught basic care of the adult post-operative client in their first clinical course, this scenario was used in all sites during this phase of the study.

In Part 1 (July 2004 to July 2005), researchers gathered data on the students' understanding of post-operative content. A total of 395 students (350 females, 45 males) completed a 12-item pre-test, viewed a videotaped lecture on care of a post-operative adult patient, and then completed a 12-item post-test. Results of a paired *t* test revealed a significant difference ($p<.0001$) between pre- and post-test scores indicating that learning took place.

In Part II (January to July 2005, project sites implemented the standardized simulation using randomized control and experimental groups. The following research questions were addressed:

1. Will students who participate in the simulation as part of the teaching/learning experience related to care of an adult post-operative patient have better learning outcomes (knowledge, self-confidence, satisfaction, judgment performance) based on the type of simulation experienced (paper/pencil case study simulation, static mannequin, or high-fidelity patient simulator?
2. Will there be differences regarding learning outcomes (knowledge, self-confidence, judgment performance, and learner satisfaction) based on the role assigned to a student in the simulation? (Jeffries & Rizzolo, 2006, Phase III: July 2004 to July 2005 section, para. 5)

A total of 403 students in their first medical-surgical nursing course were randomly assigned to one of three types of simulation groups: (a) a paper/pencil case

study simulation, (b) a hands-on simulation using a static mannequin, and (c) a hands-on simulation using a high-fidelity patient simulator. Responses on the SDS revealed a greater sense of realism in the high-fidelity group, as well as more opportunities for problem-solving and decision making in the high-fidelity and static mannequin groups than in the paper/pencil case scenario group. The EPSS revealed the high-fidelity group perceived diverse ways of learning to be greater than the other two groups, and that participation in either the static mannequin or high-fidelity groups felt a greater presence of active learning than the paper/pencil group. The Learner Satisfaction Scale revealed the students in the high-fidelity simulator group had a greater level of satisfaction with their learning experience than the other two groups. While the students in both the static mannequin and high-fidelity groups reported a greater level of self-confidence in their ability to care for a post-operative adult patient than the students in the paper/pencil case study simulation group, there was no significant difference in knowledge gains or performance judgment between the three simulation groups.

In the discussion of Phase III of the project, the researchers noted that the students had only participated in one of the three types of simulations (i.e., paper/pencil case study, static mannequin, or high-fidelity simulator). Therefore, Phase IV was designed to present students with two types of simulations in order to allow for comparison. In Phase IV of the study, the following research questions were addressed:

1. Is there a difference in learner satisfaction when two different types of simulations are used by learners rather than when each student uses only one type?
2. Is there a difference in students' perceived presence and importance of educational practices when two different types of simulations are used by learners rather than when each student uses only one type?

3. Is there a difference in students' perceived presence and importance of simulation design factors when two different types of simulations are used by learners rather than when each student uses only one type?
4. Is there a difference in student self-confidence when two different types of simulations are used by learners rather than when each student uses only one type?
5. Is there a difference in students' judgment of their performance when two different types of simulations are used by learners rather than when each student uses only one type? (Jeffries & Rizzolo, 2006, Phase IV: August 2005 to June 2005 section, para. 2)

The study was repeated with half of the participating students (n = 55) taking part in a simulation using the paper/pencil case study first, then the high-fidelity simulation whereas the other half (n = 55) participated in the high-fidelity simulation first and then the paper/pencil case study. Responses on the EPSS and SDS revealed that students perceived the following design elements to be present and important more often in the high-fidelity group than in the paper/pencil case study group: active learning, diverse ways of learning, fidelity, feedback, support, and objectives. The students in the high-fidelity group were significantly more satisfied with their learning activity and more confident than the students in the paper/pencil case study group. The students in the paper/pencil case study group judged their performance and rated collaboration and higher expectations higher than the students in the high-fidelity simulation group.

The findings of the NLN/Laerdal Simulation Study identified a set of educational practices and simulation design characteristics that provided a quality learning experience for students and should be incorporated into simulations. The project resulted in a Simulation Model to guide nurse educators in the design, implementation, and evaluation of simulations in nursing programs (Jeffries, 2005). With some small alterations to the

original model, Jeffries (2007) presented the Nursing Education Simulation Framework discussed below.

The Nursing Education Simulation Framework (Jeffries, 2007) has five components, each with several associated elements (Figure 1). The components and elements are described below.

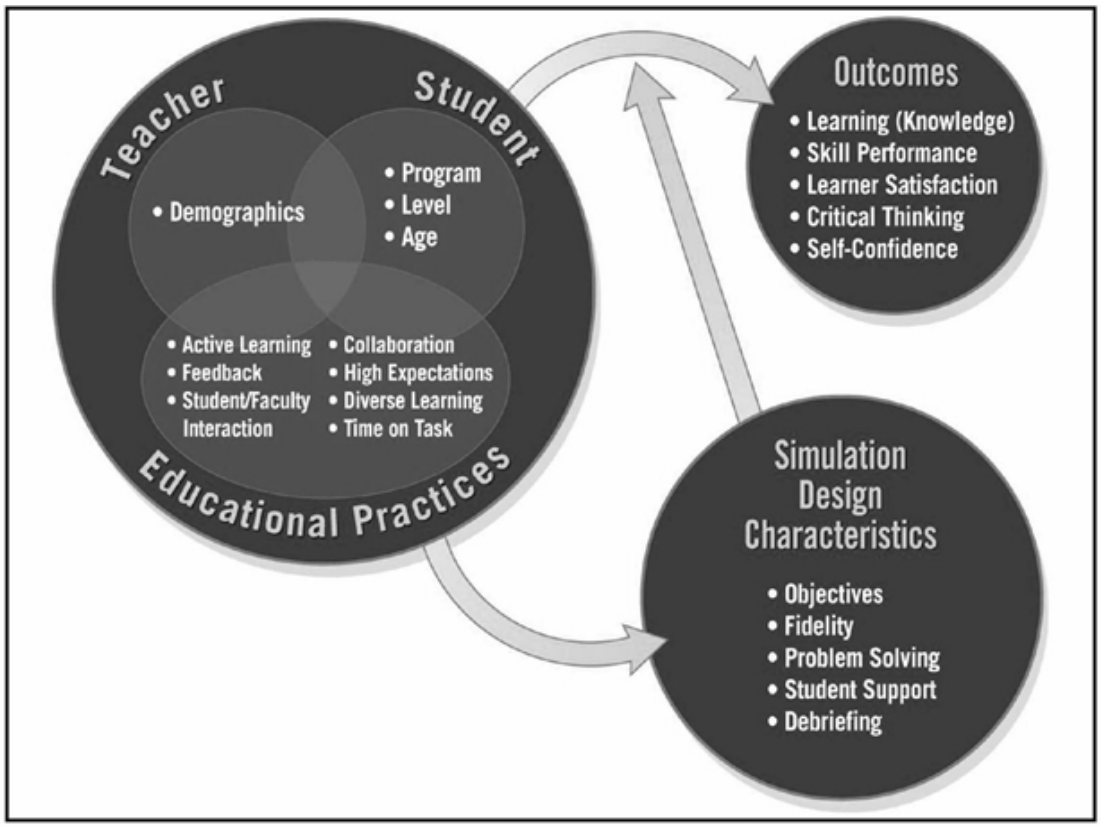


Figure 1. The Nursing Education Simulation Framework. In P.R. Jeffries (Ed.). (2007). *Simulation in nursing education: From conceptualization to evaluation*. New York, NY: National League for Nursing. Reprinted with permission.

Teacher factor. The first component of the Nursing Education Simulation Framework is the *Teacher* factor. A simulation is learner-centered, with the teacher assuming a facilitator or evaluator role. As a facilitator, the teacher would provide support and encouragement throughout the simulation, asking questions and guiding the students during the debriefing; as an evaluator, the teacher would observe and provide feedback throughout the simulation. The teacher also designs the scenario to be used, and therefore needs to be familiar with the human patient simulators in order to prepare and set up the equipment. Certain teacher characteristics such as years of experience, age, and clinical expertise (relating to teacher's role, experience, and comfort) are considered to be associated with the use of simulations in nursing education.

Student factor. The second component of the framework is the *Student* factor. Students are usually responsible for their own learning regardless of the type of simulation. They are expected to be self-directed and motivated, and be able to take on various roles such as patient, nurse, or family member during the exercise. Students are given a scenario and script that they must follow, depending on their role in the exercise. Each clinical scenario provides students with information to assess, observe, or monitor. For example, the student assigned to play the role of the nurse would be given patient-related information such as level of post-operative pain or family visiting. The student takes that information and decides what to say and what skills to perform; while another student playing the family member engages in the role he/she has been assigned. Roles can be played as that of an active participant (nurse, patient, family member) or non-active participant (observer). Like the teacher factor, characteristics such as age and

experience in nursing have an impact on the student factor in the simulation experience, performance, and achievement of learning outcomes.

Educational practices. The third component of the Nursing Education Simulation Framework is *Educational Practices*, which subsume Chickering and Gamson's (1987) seven principles of good practice in undergraduate education, namely:

- *active learning*: students learn best through activities in which they actively participate.
- *prompt feedback*: students need opportunity to perform and get suggestions for improvement.
- *student/faculty interaction:* learner-teacher contact and support is important in developing student motivation and development.
- *collaborative learning:* good learning is collaborative and social. Working with others sharpens thinking and deepens understanding.
- *high expectations*:
- *allowing diverse styles for learni*ng: students need the opportunity to learn in ways that work for them.
- *time on ta*sk: learning to use one's time well is critical for students. They need help in learning effective time management skills.

When designing simulation exercises, these features need to be incorporated in order to enhance students' performance and satisfaction with their learning (Jeffries & Rogers, 2007b). During the simulation process, students need to be actively engaged and receive prompt feedback from the teacher to reinforce their learning. The human patient simulator can support a range of learning activities, from simple (e.g., take a pulse) to complex (e.g., take vital signs during a cardiac arrest). Simulations of real-life clinical scenarios encourage students' self-assessment and decision-making skills. Feedback is helpful and informative, as students can critique their own or a peer's performance in debriefing sessions, which may also include a video recording of the simulation. Interaction with the facilitator provides opportunities for students to ask questions and reflect on the simulation, thus promoting learning.

Simulation-based exercises can also promote collaborative student learning. As noted by Gibbons et al. (2002), "collaborative learning with simulations increased a sense of collegiality and teamwork in learning and resulted in faculty-student bonding" (p. 99). If the teacher and the students have high expectations for the simulation exercise, positive outcomes can be achieved.

Educators can address diverse student learning styles by creating clinical simulations that incorporate multi-sensory props or cues; these props or cues may be visual (e.g., clock, bed, name plate), auditory (audio-recorded reports, role-playing with a family member), tactile (listening to heart or lung sounds), or kinaesthetic (tympanic thermometer or inspiratory spirometer to handle during care) (Jeffries & Rogers, 2007b). Finally, facilitators and students should use simulation time well by staying on task and learning how to use the human patient simulators before the session begins.

Simulation design. *Simulation Design* is the fourth component in the Nursing Education Simulation Framework. It incorporates five features that should be addressed when designing a simulation: (a) objectives, (b) fidelity, (c) problem solving, (d) student support, and (e) debriefing (reflective thinking). Objectives are important for simulations as they identify learner outcomes and behaviours before the simulation occurs, and provide a reference for discussion during the debriefing (Jeffries & Rogers, 2007b). They also provide specific details that allow the student to participate effectively in the simulation. Role-playing scripts and directions are given at the beginning of the exercise to prepare the student for the simulation. Fidelity is important as simulation-based practice labs need to represent real-life clinical environments in order to establish validity. If the outcome of the simulation is to enhance student's critical thinking skills

while caring for a post-operative patient, then the simulation must reflect reality as much as possible. In this study, for example, the moderate-fidelity simulator has an abdominal incision, can produce heart, lung, and bowel sounds, and has a palpable pulse. While it is important to simulate reality as much as possible, it is also important not to overload the student with too much information. Educators need to determine the level of complexity appropriate for the learner's knowledge and skills base when creating problem solving challenges in the simulation. In addition, they need to offer cues in a manner that does not interfere with the student's problem solving capabilities, yet provides information needed to progress through the simulation. After the simulation is completed, the students and facilitator take part in a debriefing session to review what happened and what they have learned. The facilitator ensures that learning outcomes are discussed as well.

Outcomes. *Outcomes* are the final component of the Nursing Education Simulation Framework. Outcomes include (a) knowledge gained, (b) skills performed, (c) learner satisfaction, (d) critical thinking, and (e) self-confidence. Educators evaluate these outcomes to identify the effectiveness of the simulation experience as well as what students have learned. To evaluate knowledge outcomes, educators may use written tests, such as a pre-test/post-test or post-test only. Students may use the simulation itself to practice and prepare their skill performance for the clinical area. Skill checklists can be incorporated when specific measurement of competence needs to be done, such as when testing skill performance. Surveys or interviews may be used to evaluate learner satisfaction, critical thinking, and/or self-confidence.

The Nursing Education Simulation Framework (Jeffries, 2007) can be used to guide the processes of design, implementation, and evaluation of simulations in nursing as well as scholarly research. Four studies were found in the literature that reference the Framework and use instruments developed by the NLN.

Childs and Sepples (2006) study was part of the NLN/Laerdal three-year, multi-site, national project described earlier in this chapter. The College of Nursing and Health Professions at the University of Southern Maine (USM) was one of eight participating nursing schools that collaborated on the overall research goals of the study. The study had two goals: (a) to test the reliability and validity of the EPSS and the SDS; and (b) to determine the effects of simulation on student confidence, usefulness of the simulation experience, and student feelings about the teaching method. A complex patient care scenario involving cardiac arrhythmias and a mock code was used as the simulated learning experience. A total of 55 students (organized into groups of four or five students) participated in four stations: identifying cardiac arrhythmias, identifying rhythm strips, arrhythmia case students, and a mock code with a human patient simulator. The results of the study included that the EPSS and SDS surveys were found to be reliable and valid. Childs and Sepples (2006) noted that the students rated the simulation experience positive overall and concluded that the simulated learning experience was valuable for the learning of psychomotor skills and critical thinking.

Smith and Roehrs (2009) examined the factors related to two outcomes of a high-fidelity simulation identified in the Nursing Education Simulation Framework (Jeffries, 2007): learner satisfaction and self-confidence. The study involved 68 students enrolled in a medical/surgical course in a junior level Bachelor of Science in Nursing program,

who completed a set of NLN instruments related to their perceptions of the simulation activity and their associated learning. Scores for the Satisfaction subscale of the Learner Satisfaction and Self-Confidence in Learning Scale ranged from 2 (disagree) to 5 (strongly agree) with an overall mean score of 4.5, suggesting that learners were satisfied with the simulation teaching method. Scores for the Self-Confidence subscale of the Learner Satisfaction and Self-Confidence in Learning Scale ranged from 1 (strongly disagree) to 5 (strongly agree) with an overall mean score of 4.2, suggesting that students felt confident that they had the capability to care for a patient with a respiratory condition following the simulated learning experience. Scores for the SDS ranged from 2 (disagree) to 5 (strongly agree) with an overall mean score of 4.8, suggesting that students had positive feelings about the presence of the five design characteristics of the simulation: (a) objectives, (b) support, (c) problem-solving, (d) guided reflection, and (e) fidelity. Objectives had the highest correlation with both student satisfaction and self-confidence, while guided reflection had the lowest correlation with satisfaction, and fidelity had the lowest correlation with self-confidence. The authors noted that the significance of the design factors had implications for nursing education, and recommended that nurse educators carefully consider the design characteristics when organizing a high-fidelity simulation for nursing students.

Reese, Jeffries, and Engum (2010) investigated the use of the Nursing Education Simulation Framework in the design of a clinical simulation for the collaborative nursing and medical management of a surgical patient with complications. Their review of related literature noted a significant gap in the literature examining the interdisciplinary features of clinical simulation. The study involved two groups: 15 senior-level (seventh

semester) baccalaureate nursing students and 15 third-year medical students. The following instruments were used to measure simulation design characteristics, learner satisfaction, and self-confidence outcomes: the SDS developed by the NLN/Laerdal project (Jeffries, 2007), the Satisfaction and Self-Confidence Scale, and a 12-item collaboration scale developed by the researchers. The results from all three survey instruments were positive for both groups: problem solving was facilitated (M = 4.44), simulation was at an appropriate level of difficulty (M = 4.46), feedback was constructive (M = 4.70), and provided in a timely manner (4.82). The lowest score was for item "My need for help was recognized" (M = 3.48). Self-confidence had an overall mean score of 4.09. The lowest mean score was for "It is the instructor's responsibility to tell me what I need to learn during the simulation" (M = 3.43). Student satisfaction ratings of the collaborative simulation exercise were high with the mean for all the items (M = 4.34). The mean score for the researcher-developed collaboration scale was high (M = 4.4). The findings of the study supported the use of the Nursing Education Simulation Framework in the design of high-fidelity clinical learning simulations. The authors concluded by emphasizing the importance of interdisciplinary collaboration in the simulated experience to help students learn to work in real-life situations, improve patient outcomes, and decrease errors in the clinical setting.

Alfes (2011) conducted a quasi-experimental study to compare the effectiveness of a simulation-based lab with a traditional lab environment for learning about comfort care measures for patients in order to promote student satisfaction and self-confidence. A total of 63 first-semester baccalaureate nursing students participated in this study: 34 students in the traditional demonstration group and 29 students in the simulation group.

The NLN's (2005) Learner Satisfaction and Self-Confidence in Learning survey was used. Analysis showed that students in the simulation experience were significantly more self-confident (M = 32.48, SD = 3.83) than students participating in the traditional group (M = 30.74, SD = 3.10). There was no significant difference in satisfaction with learning for students participating in the simulation experience (M = 20.83, SD = 3.38) and the traditional learning experience group (M = 19.44, SD = 2.34). This finding may be attributed to the fact that students in both groups were actively involved and given plenty of opportunity to practice, ask questions, and receive feedback from the teaching assistant. Alfes (2011) noted that this study supported the use of simulation-based learning experiences with beginning nursing students and encouraged nurse educators to consider simulation to assist nursing students in learning comfort care measures for their patients.

Learning Community

The second theoretical framework for this research pertained to Communities of Practice, as the study sought to explore learners' sense of community or connectedness in relation to their participation in the simulation-based practice lab. Wenger, McDermott, and Snyder (2002) define a community of practice as a group of people who "share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis" (Wenger et al., 2002, n.p.). They note that communities of practice are not a new concept, but go back in time to describe people who would get together to discuss hunting and gathering strategies. Today, communities of practice are everywhere and, as the authors suggest, we all, knowingly or not, belong to them at home, school, or work.

The purpose of a community of practice is to "create, expand, create knowledge, and to develop individual capabilities" (Wenger et al., 2002, n.p.). Learning communities have their roots in communities of practice. A learning community is a group of students bounded to collaborative learning in a classroom environment. Moisey et al. (2008) note that learning communities in distance education today take the learner beyond the isolation of yesterdays' correspondence courses and can provide "interaction, support individual and collective learning, and promote a sense of belonging and mutual support" (p. 16).

Sense of community. Research related to community dates back to the 1970s when Sarason (1974) introduced the concept of a psychological sense of community which he defined as "one of the major bases for self-definition" (p. 157). Yang and Liu (2008) note that while there have been many studies since that time to attempt to describe and measure the sense of community, the most influential and frequently cited work is McMillan and Chavis (1986). McMillan and Chavis (1986) defined community as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members needs will be met through their commitment to be together" (p. 9).

For students in distance education, having a sense of belonging to a community of learners is considered to have a positive effect on numerous factors, including student retention, commitment, and satisfaction (Rovai, 2002a). Rovai (2002a) noted that dropout rates were often higher in distance education programs in comparison to more traditional face-to-face programs, and suggested that the separation that existed among learners was a contributing factor to the decision to

drop out or stop working on a course (stop out). Rovai (2002b) also recognized that community building in distance education programs was important and that having a sense of community would help to retain learners. Earlier, Tinto (1993) similarly noted the importance of a sense of community in reducing dropout rates, arguing that students were more likely to complete courses when they had developed relationships with other students.

Classroom community. Rovai (2002a) defined a construct termed "classroom community," which applied to both face-to-face and virtual classes, and included the following dimensions: "spirit, trust, interaction, and commonality of expectations and goals, in this case, learning" (p. 4). He described *Spirit* as cohesion and a sense of connectedness among learners. *Trust* signified a willingness to rely on other students in the community, and to be genuinely interested in their learning. It was through the quality of the *interaction*, not the act itself, that a sense of community was fostered. *Learning*, the common goal of the classroom community, was achieved through active participation and transformative learning (Rovai, 2002a). Community cohesion is also related to feelings of connectedness and mutual learning experiences (Rovai, 2002b).

Rovai (2002a) identified the following seven course design factors that affected community cohesion: (a) transactional distance, (b) social presence, (c) social equality, (d) small group activities, (e) teaching style, (f) learning stage, and (g) community size. The fourth factor, small group activities, particularly relates to this research study. Rovai (2002a) suggested that the basic design of small groups actively engages learners in the activity, and promotes a sense of community. Small

(i.e., three- to four-person) collaborative groups help students make connections with each other and enhance the learning process. This study examined how students' sense of connectedness might be affected by the learning experience associated with their participation in the simulation-based practice lab.

Rovai's (2002b) study sought to develop and validate the CCS, an instrument to measure classroom community. Students (n = 375) enrolled in 28 masters-level Blackboard-based online courses took part in the study and the development and refinement of the CCS. The instrument generated an overall classroom community score as well as two subscales: connectedness and learning. Rovai (2002b) noted significant differences in classroom community across the 28 online courses, suggesting that the CCS was a reliable and valid measurement of classroom community. He called for further research to determine course design and pedagogical strategies that promoted a greater sense of community in online courses.

Further studies have supported Rovai's (2002b) findings using the CCS. Rovai and Jordan's (2004) study examined the sense of community in a higher education blended learning environment. The study involved a total of 68 students enrolled in three masters-level education courses: 24 students were enrolled in the traditional course, 23 in the blended course, and 21 in the fully online course. The blended course was found to have the highest connectedness (M = 34.91) and learning (M = 36.17) subscales, and showed a stronger sense of community than either the traditional or the fully online course. Rovai and Jordan (2004) concluded that the blended learning environment was not only about delivering instruction, but

was also concerned with producing learning, using distance education technologies, and promoting a sense of community among students.

Thurston (2005) explored the "connectedness" of 47 students enrolled in a Master of Education degree program at the University of Dundee. A virtual learning environment (VLE) was designed to provide support to the students; 31 of the 47 students in the study chose to receive the VLE support (sample group); the remaining 16 chose to receive traditional methods of support (control group). Rovai's (2002b) CCS was mailed to students, with completed instruments mailed back to the researcher. The mean CCS score (the sum of the connectedness and learning sub-scores) was 55.32 for the sample group and 41.25 for the control group. Statistically significant differences in the Connectedness subscale were found between the sample group (M = 27.52) and the control group (M = 14.56). Thurston (2005) concluded that the increased sense of connectedness had the potential to support and improve the students' academic performance.

Dawson (2006) sought to determine indicators of sense of community for students in 25 undergraduate and post-graduate online courses, according to whether the students were taking the course by external (n = 372) or internal (n = 92) delivery methods. External delivery included off campus only, where no traditional methods such as face-to-face lectures were included in the delivery. Internal delivery included courses taken on campus with traditional methods. Students completed Rovai's (2002b) CCS survey online. The response rate was 23%. Results were as follows:

- For the External delivery group, the mean overall CCS score was 41.8; the connectedness sub-score was 17.8 and the learning sub-score was 24.0.
- For the Internal delivery group, the mean overall CCS score was 49.0; the connectedness sub-score was 23.1 and the learning sub-score was 25.9.

The results of the study indicated that the increased student communication with peers and teachers associated with internal delivery appeared to result in a higher sense of community. The researcher concluded that the higher level of interaction of students with their peers and teachers (internal group) indicated a higher level of satisfaction with their course than their less-interactive peers (external group), and recommended that further research be done to determine the effects of other online behaviours that could influence student satisfaction with the online learning environment.

Moisey et al. (2008) examined the ability of computer-mediated conferencing (CMC) to enhance community cohesion. CMC is an online communication tool, often referred to as a "discussion board or forum" (p. 17). The authors suggested that asynchronous discussions were an important part of the instructional design of online courses through which communities of learners were created. They noted that a learning community takes students beyond the isolation of a distance correspondence course to "provide interaction, support individual and collective learning, and promote a sense of belonging and mutual support" (Moisey et al., 2008, p. 16), suggesting that CMC is comparable to discussions in the traditional face-to-face classroom, and can provide an ideal opportunity to develop a sense of community among distance learners. Over a period of one year, a masters-level

online course was taught four times by three instructors (one instructor taught the course in two terms). A total of 80 students were enrolled in the four offerings of the course (21, 25, 11, and 23 students, respectively). Using Rovai's (2002a) CCS and students' self-reports of CMC participation, the authors examined community cohesion as one of the variables related to community building. The mean CCS scores for the four course offerings ranged from a low of 43.6 to a high of 54.0 with an overall CCS mean score of 50.6. Analysis revealed significant positive correlations between reading CMC postings and learners' sense of community, and between sense of community and program satisfaction. There were no significant correlations between community cohesion and more active involvement with CMC postings by students. Moisey et al. (2008) recognized that it was important for distance educators to find creative ways to develop a sense of community among their learners and recommended that further research should be done using Rovai's (2002b) CCS to determine strategies and standards that would foster a sense of community among learners.

Application of Jeffries' and Rovai's Conceptual Frameworks to Simulation-Based Practice Labs

The purpose of this study was to create an effective simulation-based practice lab in a blended distance practical nursing program in order to increase the cohesiveness of the learning community involved as well as to improve instructional effectiveness and, ultimately, students' preparedness for clinical practice. The Nursing Education Simulation Framework (Jeffries, 2007) and Rovai's (2002b) Classroom Community construct provided the conceptual bases for the study. Both frameworks are equally

important in the investigation of how a simulation-based practice lab may enhance instructional effectiveness and community cohesion. The point of connection between the two frameworks is the learning community. The nursing profession values the learning community as it fosters collaborative learning and promotes the development of competent graduates. The Nursing Education Simulation Framework (Jeffries, 2007) provides students access to a collaborative learning environment that enhances their sense of community as well as their level of preparedness for clinical placement. Simulation scenarios (e.g., labour and delivery, post-partum, and newborn assessments) allow students to work in teams. Working collaboratively promotes teamwork, problem-solving, skill competency, and self-confidence (Moyer Childress et al., 2007).

Summary

Chapter 2 has provided a review of the literature on distance education and nursing, blended learning, video conferencing delivery, simulation, and experiential and collaborative learning theories. In spite of the growing research supporting the use of simulation in nursing education, instructional effectiveness and community cohesion in the design of an on-site simulation-based practice lab for distance students has not as yet been the focus of significant research. The Nursing Education Simulation Framework (Jeffries, 2007) and the Classroom Community construct (Rovai, 2002b) provided the conceptual bases to guide this research study. By exploring these new avenues for research, the study contributes to the fields of both simulation and distance nursing education.

CHAPTER 3

METHODOLOGY

This chapter provides a description of the methodology used in this research study to investigate the instructional effectiveness and community cohesion associated with a simulation-based practice lab in a blended distance nursing program. Information on the research design, procedure, instrumentation, data collection, data analysis, and limitations are included in this chapter.

Research Design

A mixed-method research design was used in this study to investigate the following research questions:

1. What effect, if any, does participation in a simulation-based practice lab have on the following outcomes of instructional effectiveness as presented in the Nursing Education Simulation Framework (Jeffries, 2007): knowledge, skills, learner satisfaction, and self-confidence?
2. What effect, if any, does participation in a simulation-based practice lab have on sense of community as measured by Rovai's (2002b) Classroom Community Scale (CCS)?

A mixed-method design was considered appropriate for the study, as the combination of quantitative and qualitative approaches offers a deeper understanding of the research (Creswell, 1994). The quantitative component incorporated a pre-test/post-test quasi-experimental design to assess the following, before and after the

simulation-based practice lab: (a) the level of community cohesion, as measured by Rovai's (2002b) CCS; and (b) the amount of subject matter knowledge, as measured by a 20-item multiple-choice quiz (designed by the researcher). After the practice lab, students also completed three surveys (a total of 49 items) developed by the NLN to assess, respectively, students' reactions to the design features of the simulation-based practice lab, the educational practices of the simulation, and their satisfaction and degree of self-confidence with their new skills and knowledge. Permission to use the three instruments without charge was acquired prior to the study (Appendix C). Copyright permission to include the three NLN research tools within this dissertation and within the Appendix of this dissertation has been granted by the National League for Nursing, New York, NY (Appendix S). The quantitative design was considered to be quasi-experimental as there was no random assignment of subjects or use of a control group (Cohen, Manion, & Morrison, 2007).

The qualitative component of the study involved semi-structured interviews with students who volunteered to be involved further in the study, with the nurse educators who conducted the lab and/or taught in the nursing program, and with clinical placement instructors. These interviews were conducted in order to obtain richer and more detailed information about the simulated practice lab, such as students' feelings about the experience and their new skills and knowledge, their attitudes towards technology and the use of simulations for learning nursing skills, their confidence in using the skills in a hospital with actual patients, and suggestions for improvement. LoBiondo-Wood and Haber (1998) note that qualitative methods focus on the whole experience and the meaning subjects give to that experience and therefore provide a broader and deeper

understanding than quantitative methods. Interviews have the ability to obtain specific "kinds of information, such as attitudes and beliefs that would be difficult to obtain without asking the subject directly" (LoBiondo-Wood & Haber, 1998, p. 318). Nurse educators were asked about their preparation and background for teaching with simulations, their attitudes toward technology and confidence in its use, their level of preparation for the simulation-based practice lab, and their suggestions for strategies for teaching using simulation. Clinical placement teachers were asked to relate their observations and impressions of students' preparedness and awareness of clinical routines (e.g., following universal precautions), as well as students' confidence in their skills and knowledge.

The researcher used multiple methods of data collection and analysis for the purpose of data triangulation. Triangulation attempts to explain the phenomena being studied more fully by studying it from more than one point of view and, in the case of this research study, making use of both quantitative and qualitative data. One advantage of the mixed-method approach is greater researcher confidence in the findings generated by the study. For example, if scores collected from a questionnaire are consistent with observational data gathered on the same phenomena, the researcher can be more confident about the findings (Cohen et al., 2007).

Participants

A group of 45 practical nursing students were the source of the sample for this study. This non-probability convenience sample consisted of all the students enrolled in

the second semester (i.e., in the first year) of the two-year diploma program. Students were located across five campus sites: 10 in Fort Frances, 12 in Atikoken, seven in Kenora, 11 in Dryden, and five in Sioux Lookout. At the time of the study, students located at each regional campus had met face-to-face at the local Contact North site for all their classes every week from the beginning of the program (i.e., Semester 1 and 2, see Table 1 for a list of courses and hours of instruction). Students at different campus sites had studied together virtually during the video conference classes, but otherwise had not interacted with or met any other students in a face-to-face learning environment.

Inclusion criteria for the study included willingness to provide informed written consent for the study and willingness to complete the quantitative data collection instruments. Students unwilling to do either of the above were excluded from the study; however, they were able to take part in the simulation-based practice lab activities.

Instrumentation

The research study used paper-and-pencil surveys and semi-structured interviews to investigate the instructional effectiveness and sense of community in relation to an on-site simulation-based practice lab in a blended distance nursing education program. Table 3 summarizes the instrumentation and data collection methods used in the study, based on the components of the Nursing Education Simulation Framework (Jeffries, 2007) and learners' sense of community or connectedness based on Rovai's (2002b) CCS construct.

Table 3

Data Collection and Instrumentation

Conceptual Framework	Data Collected	Means of Data Collection
Components of the Nursing Education Simulation Framework		
Teacher	Demographics – years of experience, age, clinical expertise Facilitator & evaluator roles Comfort and preparation for simulation	Semi-structured interviews
Student	Age, gender, experience with nursing care and simulation self-direction and motivation Group role-playing: nurse1, nurse2, family member, observer; rotate roles and discuss in debriefing Judge own progress towards achieving learning outcomes	Demographic questionnaire Semi-structured interviews
Educational Practices	Active learning Diverse learning styles Collaboration High expectations	Educational Practices in Simulation Scale (EPSS)
Simulation Design	Objectives Fidelity Problem solving Student support Feedback/debriefing	Simulation Design Scale (SDS)
Outcomes	Knowledge Skill performance Learner satisfaction Self-confidence	Pre-lab/post-lab Quiz Semi-structured interviews Learner Satisfaction and Self-Confidence in Learning Scale (LSSCLS)
Sense of Community Construct		
Sense of Community	Overall classroom community Two subscales: connectedness and learning	Classroom Community Scale (CCS) Semi-structured interviews

Demographic Questionnaire

A demographic questionnaire (Appendix A) was developed by the researcher to obtain data on gender, age, and previous experience with simulations. Information from this instrument was used to describe the sample of the study.

Knowledge Quiz

Knowledge gains were measured by an instructor-developed 20-item multiple-choice quiz (Appendix B) administered before and after the simulation-based practice lab. The pre-lab and post-lab quizzes were identical (i.e., the questions and choices were in the same order on both versions). The questions related to the following course content areas: nursing care of the mother and newborn during the antepartum, labour and delivery, and postpartum phases. The content was presented in both the theoretical and practical components of the lab. The questions on the quiz were extracted from the course textbook test bank. Content validity of the knowledge quiz was confirmed by three expert clinicians who agreed that the questions fairly and comprehensively covered the course content.

National League for Nursing Instruments

Jeffries and Rogers (2007a) recommend that a simulation-based practice lab be examined in three areas design, implementation, and outcomes. Following this advice, three instruments developed by the NLN — the SDS, the Educational Practices Questionnaire, and the Learner Satisfaction and Self-Confidence in Learning Scales — were used in this research study. Permission to use the three instruments was acquired prior to the study (Appendix C).

Simulation Design Scale. The SDS (Appendix D) was designed to evaluate the five design features of simulations (Jeffries & Rogers, 2007b). The SDS is a 20-item tool with the following subscales: (a) objectives/information, (b) student support, (c) problem solving/complexity, (d) fidelity, and (e) guided reflection/ debriefing. Each design feature is associated with several statements. For example, the following statement is associated with the *Objectives and Information* subscale: "I clearly understood the purpose and objectives of the simulation" (Jeffries & Rogers, 2007, p. 95).

The instrument has two parts: one asks students to rate the presence of each of the five design features in the simulation, and the other asks the students to rate the importance of those features; as such, two subscales are produced for each of the five design features (Jeffries & Rizzolo, 2006). The presence of the design feature is rated from 1 (Strongly Disagree with the statement) to 5 (Strongly Agree with the statement). A Not Applicable (NA) option is also provided. The importance of the feature is rated from 1 (Not Important) to 5 (Very Important).

The psychometric properties of the SDS are well established. Content validity for the instrument was determined by a panel of 10 content experts in simulation development and testing. Cronbach's alpha was used in the NLN and Laerdal Medical project to test internal consistency and reliability for each scale, and was found to be 0.92 for presence of features and 0.96 for the importance of features (Jeffries & Rizzolo, 2006).

Educational Practices in Simulation Scale. The EPSS (Appendix E) is a 16-item questionnaire that measures the degree to which best educational practices

are present in the simulation, and the importance of each practice to the learner (Jeffries & Rizzolo, 2006). In the EPSS, Chickering and Gamson's (1987) original seven principles have been collapsed into four subscales: (a) active learning, (b) diverse ways of learning, (c) high expectations, and (d) collaboration. The following item is included in the *Diverse Ways of Learning* subscale was: "The simulation offered a variety of ways in which to learn the material" (Jeffries & Rogers, 2007, p. 97).

Like the SDS, the EPSS measures both the presence of the education practices in the instructor-developed simulation, and the importance of each of the practices to the learner. Presence of the educational practice items are rated from 1 (Strongly Disagree with the statement) to 5 (Strongly Agree with the statement), and include a Not Applicable (NA) option. Items on the importance of the practices are rated from 1 (Not Important) to 5 (Very Important).

Content validity of the EPSS was established by a panel of nine nurse experts (Jeffries & Rogers, 2007a). A Cronbach's alpha of 0.86 for the presence of specific practices, and 0.91 for the importance of specific practices was calculated for the instrument in the NLN and Laerdal Medical project (Jeffries & Rizzolo, 2006). A research study by Reese, Jeffries, and Engum (2010) presented further confirmation of psychometric properties of the EPSS, reporting a Cronbach's alpha of 0.904 for the survey instrument.

Learner Satisfaction and Self-Confidence in Learning Scale. The Learner Satisfaction and Self-Confidence in Learning Scale (see Appendix F) is a 13-item instrument that measures two subscales: student satisfaction with the simulation (five

items) and self-confidence in learning (eight items). The latter subscale indicates how confident students are about the skills they practiced in the simulation, as well as their knowledge in caring for the type of client portrayed in the simulation. The following item is included in the *Satisfaction in Learning* subscale: "The teaching methods used in this simulation were helpful and effective" (NLN, 2005, p. 2). An example of an item in the *Self-Confidence in Learning* subscale is "I am confident that I am mastering the content of the simulation activity that my instructors presented to me" (NLN, 2005, p. 2). Items on both subscales are rated from 1 (Strongly Disagree with the statement) to 5 (Strongly Agree with the statement). The scale also includes a Not Applicable (NA) option.

Content validity of the Learner Satisfaction with Learning Scale and the Self-Confidence in Learning Scale was established by a group of nine clinical experts in the NLN and Laerdal Medical project. A Cronbach's alpha of 0.94 for satisfaction and 0.87 for self-confidence was reported. (Jeffries & Rizzolo, 2006).

Classroom Community Scale

The study measured participants' sense of being part of a learning community using the CCS (Appendix G), which was administered before and after the simulation-based practice lab. Rovai (2002b) developed the 20-item survey to measure connectedness and learning as factors of classroom community among university students taking online distance courses. The CCS generates an overall score between 0 and 80, reflecting the strength of the classroom community. There are two subscales: connectedness and learning; each sub-score yields a value between 0 and 40. Connectedness corresponds to the students' feelings of cohesion, spirit, trust, and

interdependence. Learning corresponds to their feelings about interacting with each other as they construct knowledge and share values as well as the beliefs they hold in regards to the extent to which their educational goals and expectations are being met (Rovai, 2002b).

Within the set of 20 questions, 10 questions are related to the connectedness subscale and 10 questions to the learning subscale. Half of the items are positively worded; half are negatively worded. Each question has a 5-point Likert-type scale of possible responses: strongly agree, agree, neutral, disagree, and strongly disagree. The students' choices are given a value of 4 to 0 accordingly. The odd-numbered items (1 to 19) are added together for the connectedness subscale and the even numbered items (2 to 20) for the learning subscale; the sum of the weights of all 20 items yields an overall CCS score. Higher scores reflect stronger community cohesion (Rovai, 2002b).

For the purposes of the study, minor editorial changes were made to the CCS in order to promote clarity. The word *course* was changed to *course/lab* to avoid confusion, as the nursing students completed the instrument twice: after the videoconference theory class held four weeks before the practice lab, and after the concluding activity of the simulation-based practice lab. The revised version was reviewed by two practice lab facilitators to ensure there was no significant variation from the original tool. Permission to use the CCS and make changes was received from the author (Appendix H).

Interview Questions

Semi-structured interviews took place with volunteer student participants, lab facilitators, and clinical placement instructors. The researcher developed a set of

questions to serve as a guide for the interviews with each of the three groups). The three sets of interview questions were reviewed by two experts in obstetrical nursing who were familiar with the content and expected outcomes of the simulation-based practice lab.

Student interview guide. The student interviews were based on seven open-ended questions related to the research questions, and addressed the following: (a) knowledge, (b) skills, (c) learner satisfaction, (d) self-confidence, (e) connectedness, and (f) learning. The seven student interview questions were as follows:

1. How did you find the simulation experience?
2. Do you feel the simulation experience helped you to better understand the maternal-newborn content from the March videoconference class? Can you explain how?
3. Did you feel that the experience contributed to the development of your clinical skills? If yes, can you name a specific event in the simulation that was beneficial to that development?
4. What types of things that you learned in the simulation-based lab will help you in the clinical placement setting? (Probing question: Can you further explain how they will help?)
5. What was it like to work together as a group?
6. Did the presence of other students in the simulation help you with your learning? If so, can you explain how?
7. Do you have any additional comments that you would like to add?

Facilitator interview guide. The six questions in the Facilitator Interviews were based on the Teacher component of the Nursing Education Simulation Framework (Jeffries, 2007). The six facilitator interview questions were as follows:

1. How many years have you taught in the nursing program?
2. What is your clinical expertise?
3. How did you find the simulation experience?
4. Were you comfortable with the simulations that were used? Can you explain how?
5. Did you require any assistance to learn about the technology? Or your role as facilitator?
6. Do you have any additional comments that you would like to add?

Clinical placement instructor interview guide. The five questions for the Clinical Placement Instructor interviews were based on teacher characteristics and sought to investigate the teacher's perceptions of student preparation and skill performance in the clinical area post simulation-based practice lab experience. The five clinical placement instructor interview questions were as follows:

1. What clinical placement area are you currently working with the students in?
2. Have you supervised clinical placement with them before this rotation?
3. Have you noticed a change in their skill performance after participating in the simulation-based lab?
4. Have you noticed a change in their self-confidence after participating in the simulation-based lab?
5. Do you have any additional comments that you would like to add?

Procedures

As noted in Chapter 1, all students in the practical nursing program complete a lab course, Nursing Practice II, in the second semester of the two-year diploma program. The simulation-based practice lab, which addresses maternal-newborn nursing care, makes up five of the 45 course hours. Upon their acceptance into the practical nursing program, students were informed that they would be required to travel to and participate in the on-site practice lab and clinical experience.

Pre-Lab Phase

Announcement and invitation. Students were notified six months in advance that a simulation-based practice lab and a social event would be held at the main college campus at the end of the second semester of the first year of the program. A poster was placed on the Blackboard site in the Nursing Theory I course, as well as on the office bulletin board at each regional campus (Appendix I).

Eight weeks prior to the simulation-based practice lab, all students and faculty were sent a letter of invitation to participate in the research study (Appendix J). The letter explained the purpose of the research and described the quantitative and qualitative parts of the study. Students and faculty were asked to email the researcher indicating their intent to participate in either part.

Informed consent procedures. As a follow-up to the invitation , four weeks prior to the simulation-based practice lab, campus teaching assistants distributed the "Information and Consent to Participate in a Research Study" letter (Appendix K) to students at the beginning of the two-hour video conferencing class. During this class, the theory teacher (not the researcher) described the research study, including the risks and benefits, the right to refuse, and matters pertaining to the privacy, confidentiality, and anonymity of the study participants. After the class, signed consent forms were collected by the teaching assistant at each site and forwarded to the researcher by interoffice mail.

The researcher then gave the signed consent forms to the volunteer teacher at the Thunder Bay campus who was responsible for administering the surveys after the simulation-based practice lab. This step ensured that each student participating in the study had submitted a written consent form prior to the simulation-based practice lab.

Theory presentation. At the video conferencing session conducted four weeks prior to the simulation-based practice lab, students in all the regions simultaneously received a two-hour class on maternal/newborn theory via video conferencing. A nurse educator from the Thunder Bay campus who was familiar with the content and video conferencing delivery volunteered to teach the class. The virtual class was to ensure the quality and consistency of information received. This was the first time a

standardized delivery of this content was done; previously practice lab theory was presented by a lab instructor at each campus site.

Pre-lab data collection and coding. Preparation: To allow a data set to be assembled for each subject and to ensure anonymity, students were assigned an identifying code by the teaching assistant to write on the scoring sheets for the pre-test and the CCS. The regional campus teaching assistants had prepared a sheet of 20 randomized codes (not in chronological order) that had been set up and sent to each campus by the Nursing Department secretary to ensure that the researcher could not match a set of codes to a campus site.

Once the pre-lab knowledge quiz (Appendix B) and the pre-lab CCS (Appendix G) were administered at the conclusion of the class, students were asked to bring the completed instruments forward to the on-site campus teaching assistant at their location. The teaching assistant arbitrarily assigned each student a code from the list and wrote the code on the surveys. (No student names appeared on any of the survey instruments.) The teaching assistant then wrote that student's name beside the assigned code on the list.

All the surveys and codes for all five campus sites were then placed in a Confederation College envelope and sent interoffice mail to the main campus addressed to the volunteer nursing teacher.

At later post-lab administrations of the instruments, the nurse teacher volunteer checked the student's name and found the code previously given to that student; the assigned code was written on the post-simulation documents. Therefore, there was no identifying information on any of the pre- and post-simulation knowledge quizzes and CCS, as well as the three post-simulation NLN instruments.

After the post-lab instruments were coded, they were organized into student data sets. The volunteer nursing teacher collated 42 sets of completed surveys, and gave them to the researcher in two large Confederation College envelopes.

The demographic questionnaires were completed in the introduction session of the simulation-based practice lab. No student name or code appeared on any of the completed questionnaires. A nurse educator assisting the simulation facilitators collected the completed, unsigned demographic surveys and gave them to the researcher in a large Confederation College envelope. The researcher photocopied a complete set of all surveys for safe-keeping and stored them in a secure filing cabinet at home; the originals were used for scoring and data entry.

Lab scheduling and group organization. To accommodate the large size of the class in the practice lab setting, the students were divided into three groups based on their travel time and arrangements. Students from the farthest sites (Kenora and Sioux Lookout) were scheduled to attend the Friday afternoon lab so that they did not incur the cost of an additional night's stay. It was planned that 15 students would take part in the simulated practice lab on Friday afternoon from 3:00 to 5:00 pm, 16 students on Friday evening from 7:00 to 9:00 pm, and 12 students on Saturday morning, from 9:00 to 11:00 am.

Students were invited to attend a "Pizza and Pop" social event to be held in the college cafeteria on Friday evening between 5:00 and 6:00 pm. Assigned seating was used to mix students from various campus sites, and two icebreaker activities were conducted to encourage the students to talk and get to know each other.

For the practical component of the simulation-based practice lab, students were further divided into groups of three or four students. A simulation rotation was devised to ensure that each group participated in an orientation, all three scenarios, a debriefing session, and the social event (Appendix L). The rotation schedule was given to students prior to the lab experience and posted outside each room of the simulation lab environment to serve as a reminder for students and facilitators.

Simulation Lab Phase

Orientation session. During the orientation session in the first hour of the simulation-based practice lab, the students were introduced to a description of the planned activities and short video clip was shown depicting the nature of the simulations. The students were then given an opportunity to practice taking vital signs and listening to breathing and fetal heart sounds on the simulators.

Lab organization and simulation settings. To decrease the possibility of bias due to a researcher effect in this study, the researcher was not involved in the instruction or implementation of the simulation-based practice lab. Five nursing educators volunteered to assist with the simulation-based practice lab and with data collection and coding. Three nursing educators familiar with the practice lab content and design facilitated the simulation-based practice labs, one for each of the three scenarios, and conducted the debriefing. One nursing teacher helped with orientation and organization of the weekend lab. One nursing teacher assisted with data collection, checking the student attendance list, cross-referencing codes for the surveys, invigilating the post-lab knowledge quiz and CCS, and the NLN surveys, and compiling the student data sets.

Based on the simulation rotation schedule (Appendix L), each group of students rotated through the three simulation scenario stations set up in separate practice lab environments at the main college campus (Figure 2).

Simulation Lab Room #2 Patient's Room – Maternity Floor	Simulation Lab Room #1 Labour and Delivery Room
Hallway	
	Simulation Lab Room #3 Newborn Nursery

Figure 2. Arrangement of simulation practice lab rooms.

Efforts were made to replicate real-life clinical environments for childbirth in a labour and delivery room, care of a postpartum mother with a Caesarean section in a patient's room on a maternity floor, and an assessment of a newborn in a nursery. The simulation-based practice lab rooms at the main campus contained all the equipment and supplies needed to implement the three simulation scenarios.

- There was a control room with sound equipment to project voice to the birthing simulator in Lab Room #1. Cameras and a microphone broadcasted to the computer in the control room and allowed the facilitator to see and hear what took place during the simulation scenario.

- Simulation Lab Room #2 housed the postpartum Caesarean section scenario. A hospital bed unit complete with equipment (such as portable blood pressure cuff, tympanic thermometer, bath basin, K-basin, and bedpan) as well as simulated oxygen and suction outlets were in place.
- Simulation Lab Room #3 housed the newborn nursery, which was equipped with baby mannequins, tables, and the supplies needed to complete a newborn assessment.

A total of one hour was allocated for each scenario. The role-playing activity was 30 minutes in duration. Each student played their assigned roles in a series of enactments of the scenario.

The template for the labour and delivery simulation scenario is included in Appendix M. This is a modified version of the Simulation Design Template presented by Childs, Sepples, and Chambers (2007). A similar design was used for the post-partum mother and newborn assessment scenarios.

Debriefing sessions. When the 30-minute time allotment for each simulation was completed, each group of students met for a 20-minute debriefing session with the facilitator. Each facilitator began the discussion with the same set of questions, and encouraged students to provide individual and peer feedback on the performance of their assigned roles (i.e., nurse 1, nurse 2, observer, family member) in the simulation. Upon completion of the debriefing session, 10 minutes was allocated for students to rotate on to the next simulation and for facilitators to reset the stations.

Upon completion of the simulation scenarios and debriefing, students gathered in a separate classroom for a wrap-up of the simulation-lab experience.

Post-Lab Phase

Administration of surveys. Students completed the SDS, EPSS, the Learner Satisfaction and Self-Confidence Scale, and the post-lab knowledge quiz and CCS. A nursing teacher volunteer ensured that students affixed the correct numeric code by checking the coded class lists and that no names appeared on the surveys or post-tests.

The surveys were scored by the volunteer teacher by following the scoring directions included with the instruments. The same nursing teacher filed each set of completed data collection instruments in a separate envelope and wrote the corresponding numeric code on the outside of the envelope.

Interview Procedures

Telephone and face-to-face interviews took place over a period of six weeks after the simulation-based practice lab. Three sets of interviews were conducted: student, facilitator, and clinical placement instructor.

Each interview began with a short introduction and explanation of the interview process, as well as a request for permission to tape record the conversation for accuracy. All participants were told that they could refuse to answer any question and that they could end the interview at any time. Each interview ended with the question, “Do you have any additional comments that you would like to add?” Each participant was thanked for their participation in the second phase of the research study.

A set of open- and closed- ended questions were identified for the interviews. Questions were repeated at a participant’s request. The interviewer reworded questions to clarify or expand on a participant’s answer as needed. The repeated aspect of

questioning and verifying is an important part of qualitative data collection and analysis as researchers must listen carefully to what they hear and experience to determine meaning (Streubert Speziale & Carpenter, 2007).

Student interviews. Eight weeks prior to the simulation-based practice lab, a letter of invitation was sent to the 45 practical nursing students asking for volunteers to participate in a telephone interview as the second phase of the research study. Students who volunteered for the interview were contacted by the researcher and a mutually convenient time scheduled for the interview.

The researcher used a quiet, private distance education meeting room at the college to conduct the telephone interviews. She called each student using a telephone with speaker-phone capabilities. A digital recorder placed next to the phone recorded each interview in its entirety. The researcher conducted each interview, reading from a "Student Interview Questions" guide sheet to ensure consent and consistency (Appendix N).

Facilitator interviews. The three nursing faculty members who assumed the role of facilitators in the simulation-based practice lab agreed to be interviewed. As the researcher is also a member of the nursing faculty, a third party (a non-nursing faculty member) volunteered to conduct the face-to-face interviews. The alternate interviewer was used in order to allow the facilitators to respond to the questions more comfortably or openly or with more candor, particularly if they had negative comments that they might be hesitant to relate to the researcher.

Prior to conducting the interviews, the researcher met with the volunteer interviewer and reviewed the following aspects of the interview process: obtaining

consent, right to refuse or end the interview, consistency in asking the questions, repeating questions, ways of clarifying answers.

The interviews took place in a quiet, private meeting room at the college. A digital recorder recorded each interview in its entirety. The interviewer conducted each interview reading from a "Semi-Structured Interview Questionnaire for Lab Facilitators" (Appendix O).

Clinical placement instructor interviews. The five part-time clinical placement instructors gave consent to be interviewed. None of the interviewees had previously worked with the researcher.

The researcher used a quiet, private distance education meeting room at the college to conduct the telephone interviews. She called each clinical instructor using a telephone with speaker-phone capabilities. A digital recorder placed next to the phone recorded each interview in its entirety. The researcher conducted each interview reading from a "Semi-Structured Interview Questionnaire for Clinical Placement Instructors" (Appendix P).

Data Analysis

Quantitative Data Analysis

Prior to analysing the quantitative data, all data entries were reviewed for entry errors. All errors were corrected prior to analysing data using SPSS ® Version 17.0. Descriptive statistics were obtained first, followed by appropriate statistical analysis. The following describes the analysis for the data obtained on the demographic questionnaire,

pre- and post- lab knowledge quizzes, pre- and post-lab administrations of the CCS, and the three NLN instruments: SDS, EPSS, and the LSSCLS.

Demographic data were described in terms of frequency and percentage. Characteristics (age and gender) can be measured on a nominal scale as they describe the attributes of a sample (Huck, 2000).

Descriptive and relational statistics were used to analyze the data provided by the pre- and post-knowledge quizzes. Using the number of correct answers on the pre- and post-tests, an overall mean score and standard deviation was calculated. Because the subjects were the same group of students, a t-test for dependent group or paired *t* test was used to determine if the difference in scores was based on knowledge gain following the simulation-based practice lab experience. This test is used to compare means in a sample when the group consists of the same people, i.e., a within-subjects design (Polit, 2010).

Descriptive and relational statistics were used to analyze the data provided by CCS surveys administered before and after the simulation-based practice lab. First, the CCS Connectedness subscale scores were obtained by adding the weights of all the odd-numbered questions and the CCS Learning subscale scores were obtained by adding the weights of all the even-numbered questions. An overall mean score and standard deviation were calculated for each pre- and post-lab CCS subscale. A paired *t* test was then used to determine differences within each subscale.

Second, an overall CCS score was obtained by adding the weights of all 20 items. A paired *t* test was then used to determine if there was a significant difference between the two administrations of the survey in the sense of community in the group as a whole.

Third, an overall mean score and standard deviation were calculated for the "Before Social" and "After Social" post-CCS Connectedness subscale scores. All students participated in the social event at some point during the two-day experience, either before (n = 19) or after (n = 23) the simulation-based practice lab. A paired *t* test was used to determine if there was a significant difference between the sub-scores of each group, i.e., if the social event had affected the students' sense of connectedness as measured by the CCS.

Descriptive statistics were used to analyze the data obtained by the SDS and the EPSS. Data from the SDS were analyzed and mean scores were calculated for the ratings of the presence and the importance of the 20 simulation design features. This analysis revealed the participants' perceptions of simulation design features. Using the data from the EPSS, mean scores were calculated for the ratings of the presence and importance of the 16 educational practice elements. This analysis provided the participants' perceptions of whether best practice principles were being used in the simulation-based practice lab activities.

Descriptive statistics were used to analyze the information provided by the Learner Satisfaction and Self-Confidence in Learning Scale. An overall mean and standard deviation was calculated for each of the five items in the satisfaction subscale. This analysis was done to examine the participants' levels of satisfaction with each element of the simulation experience. An overall mean and standard deviation were also calculated for each of the eight items in the self-confidence subscale. This analysis was done to examine the participants' perceptions of how confident they felt about their

knowledge and ability to perform the skills needed to care for the type of clients presented in the simulation experience.

Qualitative Data Analysis

Data analysis for the qualitative portion of the research study began prior to the interviews and continued through transcription, coding, and interpretation of the interview text. Interviews were conducted with 27 students, three simulation-based practice lab facilitators, and five clinical placement instructors. The interviews were audio-taped with permission, and transcribed by an independent transcriptionist. The researcher compared each transcript with the original recording to ensure accuracy (Burns & Grove, 2009).

The three sets of interview transcripts were subjected to qualitative analysis using a selective or highlighting approach for isolating thematic statements. The selective approach focuses on phrases or sentences that are considered to be essential or revealing about the experience described in the text of the transcripts (van Manen, 1990).

Qualitative research focuses on the human experience and the meaning that individuals who are living that experience give to it. The methods used in qualitative research allow a broader understanding and deeper insight into human behaviours (Lincoln, 1992).

Thematic analysis is a method for "identifying, analyzing and reporting patterns (themes) within data" (Braun & Clarke, 2006, p. 79). A theme identifies something important in the data in relation to the research questions and implies a level of patterned response or meaning. Thematic analysis is a step-by-step process that begins when the coder/researcher notices patterns of meaning in the data and ends with the reporting of

those patterns/themes and sub themes (Braun & Clarke, 2006). The data generated from the use of qualitative analysis added detail, providing a rich description and insight into what was being studied. Moreover, in addition to a greater understanding of the area of study, triangulating the qualitative and quantitative findings provided complementary analyses, strengthening the validity of this study's findings (Norwood, 2010).

The steps used in analyzing the content of the taped interviews followed Bogdan and Bilken's (1998) basic manual coding procedures as described below.

Pre-coding procedure. A collaborative coding process involving two independent coders was used in order to promote the rigor of the study. Data analysis can benefit from the collaborative process because views are discussed openly and explicitly in a way that is difficult to replicate when done as a single researcher (Paulus, Woodside, & Ziegler, 2008). Collaborative coding sought to provide corroborating evidence for conclusions drawn in this study. Paulus et al. (2008) proposed that collaboration can be a method for enhancing rigor and consequently strengthen the validity of research findings. It is important therefore to develop clear and transparent guidelines that can be followed by the researcher and others to eliminate sources of error.

Prior to the coding procedure, the researcher selected a co-coder. The co-coder was chosen because she was knowledgeable about the second semester nursing practice labs and the maternal-newborn content. She was also familiar with simulation as a teaching strategy as she had read articles on the topic, attended conferences, and written simulation scenarios.

The Collaborative Coding Process. To prepare for the collaborative coding process, the researcher and the co-coder discussed the study's research questions and the use of thematic analysis as an approach for qualitative data analysis. A data-driven inductive approach organizes the data to identify and develop themes (Fereday & Muir-Cochrane, 2006). Understanding the purpose of developing and sorting the coding categories is an important step in data analysis (Bogdan & Biklen, 1998). It was pre-determined that the unit of analysis would be the sentence, and that themes would be expressed in a single word or phrase relevant to the research questions.

Coding procedure. The three sets of interviews were coded separately in the following order: students, facilitators, clinical placement instructors. The coding was done in a sequence of five steps and followed the selective or highlighting process for isolating thematic statements suggested by van Manen (1990). In this approach, the coder focuses on the phrases or sentences that are essential or revealing about the experience that is being described in the body of the text (van Manen, 1990).

1. The three sets of data were organized in chronological order according to the time when the data were collected. A Microsoft word file was created for each set of interviews. Qualitative data analysis requires that the researcher become immersed in the data (Streubert Speziale & Carpenter, 2007). In a meeting, the researcher and co-coder agreed to read and re-read the transcripts independently in order to immerse themselves in the data, as well as to listen to the recordings to increase their knowledge of the data and ensure the

accuracy of the transcriptions. They also agreed to begin a preliminary list of possible coding categories as they read through the transcripts carefully.

2. Both coders worked independently for two weeks, reading the transcripts and identifying preliminary coding categories. As they read through the data, phrases or sentences that stood out (e.g., a research question or description of lived experience) were underlined and a word was noted in the margin to represent the topic. The underlined phases and sentences were then reviewed and highlighted with different colors. The topics were clustered and preliminary coding categories began to emerge. Research notes and memos were written directly on the transcript or on paper sheets and kept with the original transcripts for audit if requested.
    a. The researcher printed a hard copy of the Word documents and used different coloured highlighters to identify similarities. Each entry was read and code words were written in the margins. Comments and memos were written on a separate sheet of paper. All data were carefully read twice.
    b. The co-coder chose to color code similarities within the Word document using text highlighter colours. Comments and memos were typed into a separate document. All data were carefully read twice.
3. The researcher and co-coder met two weeks after the initial meeting to review their preliminary categories. Each set of interviews was reviewed separately in the following order: students, facilitators, and then clinical placement instructors. Both sets of categories were discussed; the researcher wrote

her categories first on a sheet of paper, the co-coder aligned her categories with the researcher's list. Overlapping themes were identified. New themes were agreed upon for each set of transcripts after much discussion and compromise. The preliminary coding categories were given an alphabet letter for each set of transcripts respectively. These transcripts and notes were photocopied so that each coder had an identical set of preliminary coded data.

4. The researcher and co-coder agreed to review the transcripts again to identify sub-codes for each set of preliminary categories by marking each unit (sentence) with the appropriate coding category, and then to group topics that relate to each other. The researcher and co-coder spent another two weeks reviewing the data according to the preliminary categories and assigned an alphabet letter to the units of data to identify sub-codes for each category.
5. After two weeks, the researcher and co-coder met again to finalize the coding categories (themes), assigned codes for the units of data, and sub-codes (subthemes). Together, the researcher and co-coder carefully analysed, discussed, and agreed upon each letter assigned to sentences in the units of data (transcript sentences). They discussed the inclusion or deletion of a few of the assigned coding categories for the units of data. Through reflection and inductive analysis, they identified the themes and subthemes for the three sets of interviews: students, facilitators, and clinical placement instructors.

Maintaining Rigor in Qualitative Analysis

Research, as a formal process, is well organized and carefully planned. The research process itself is described as rigorous (Norwood, 2010). Rigor in research is defined as "systematically striving for excellence and accuracy" (Norwood, 2010, p. 5). A second significant feature of research is its goal to provide reliable (i.e., trustworthy) and valid (i.e., accurate) knowledge (Norwood, 2010).

Norwood (2010) notes that while quantitative data analysis is rule driven and characterized by tests for reliability and validity, and formula-based statistical analysis, qualitative data analysis is an emergent and flexible process. The author goes on to propose that the absence of preset and universal rules gives the appearance that the qualitative data analysis process is easier and more relaxed. Norwood (2010) explains that this way of thinking is a disservice to what qualitative data analysis is really about: "organizing, synthesizing, attaching meaning to, and meticulously paying attention to detail and tracking connections between large amounts of narrative data" (p. 341). As qualitative research findings are gaining recognition as an alternate from of scientific inquiry (Sandelowski, 1986), there is a need to identify the specific steps taken in a study to ensure rigor.

Guba and Lincoln (1981) identified four factors associated with rigor in quantitative and qualitative research: truth value; applicability; consistency; and neutrality (cited in Sandelowski, 1986, p. 29).

The truth value of quantitative research relates to the validity of tests and instruments that measure the phenomena being studied. The truth value in a qualitative study involves finding the human experience as perceived by the subjects,

rather than the researcher. Credibility is present when the descriptions of the experience are recognizable by the subjects, other researchers, or readers (Sandelowski, 1986).

Applicability of quantitative research relates to the degree that the findings and procedures of the study are comparable outside the research environment. From the qualitative perspective, generalizability and representativeness are frequently not required because it is more naturalistic with fewer controlling conditions (Sandelowski, 1986). Sandelowski (1986) further notes that representation in qualitative research most often refers to the data, not the subjects or settings. Guba and Lincoln (1981) proposed that "fittingness" be the condition that applicability of qualitative research be based on those differences. When a qualitative study can "fit" its findings into environments outside of the study and the readers can find meaning and application within their own experiences, then the study has achieved the condition of fitness (Guba & Lincoln, 1981).

The reliability of a measure refers to consistency, stability, and dependability in quantitative research and is considered a pre-condition for validity (Sandelowski, 1986). All measurement techniques contain some potential sources of error (Burns & Grove, 2009). Guba and Lincoln (1981) advise that auditability is the standard of rigor that relates to consistency of qualitative findings. Auditability requires the researcher to present a clear decision trail that another researcher could identify and follow, as well as arrive at the same or comparable conclusion.

Guba and Lincoln's (1981) fourth factor relating to tests of rigor is neutrality, which refers to freedom from bias in the research process and findings. Objectivity is the measure of neutrality when reliability and validity are achieved in quantitative research

(Sandelowski, 1986). Guba and Lincoln (1981) note that confirmability is the measure of neutrality in qualitative research and is achieved when truth value, applicability, and auditability are established. Qualitative research values engagement with the subjects rather than detachment, as is the case in quantitative research. By reducing the distance between researcher and subjects, qualitative researchers can emphasize the meaningfulness of the findings.

Examples of research strategies used in this study to achieve rigor as it relates to Guba and Lincoln's (1981) framework included the following: audio taping of interviews, transcription audit (both coders checked the accuracy of the audio tape and the transcripts), field notes, and memos. As mentioned earlier, an additional research strategy used in this study was the use of co-coders. Collaborative coding offers greater consistency in the findings as individual meanings become collaborative meanings after discussion and confirmation of themes and sub themes. Identifying the steps and guidelines for coding prior to analysis made the process transparent and replicable.

The level of agreement between two or more coders is known as inter-rater reliability (Burns & Grove, 2009). Inter-rater reliability is a method to ensure themes or codes are constant (Paulus et al., 2008). A concern with the traditional measure of inter-rater reliability, which counts the number of rater agreements and presents it as a percentage or degree of agreement, is that it does not take into account the probability of chance agreement between raters which is likely to inflate percentages in all cases, especially with two coders and few coding categories (Grayson & Rust, 2001). To promote inter-rater reliability, this study used emersion (i.e., reading and re-reading the interviews) and discussion between both coders at the various stages of the coding

process (i.e., constantly checking individual and collaborative interpretations) to understand the meaning of the data.

A difficulty associated with the use of multiple coders is coder drift. Marston, Zimmerer, and Vaughan (1978) identified coder drift as the change that takes place in the way observation is used by multiple coders. Coders who observe the same behaviour may change or "drift" in the consistency of their observations if ground rules are not established to help them code reliably.

For the purpose of this study, coder reliability referred to the agreement between the two coders analysing the same data during the same time frame. To ensure that the researcher and co-coder followed the same processes, they wrote out and agreed upon each step of the process in advance. Coder reliability is strengthened with the development of such clear and concise guidelines. Paulus et al. (2008) proposed that "making the collaborative process among researchers transparent has great potential for adding rigor to qualitative data analysis" (p. 236). In addition, both coders checked in with each other on a regular basis. Marston et al. (1978) noted that coders who communicate with each other tend to drift in the same direction – the changes that they make are consistent with each other.

Ethical Considerations

Ethical issues and standards must be considered and met in both quantitative and qualitative research. Researchers have a responsibility to design their study in a way that maintains ethical principles and protects human rights (Streubert Speziale & Carpenter, 2007).

Students were notified verbally and in writing about the requirement to attend the simulation-based practice lab when they were accepted into the practical nursing program. At that time, each campus manager informed their students that they would have to travel to Thunder Bay to attend the simulation-based practice lab and incur expenses related to their attendance.

Although the simulation-based practice lab was a graded component of their program, students were informed that their participation in the study was voluntary and that they could refuse to participate in the study or leave the study at any time without prejudice or academic penalty. Consent forms were obtained prior to data collection (see Appendix K).

Researchers must consider issues of anonymity and privacy during data collection and manuscript writing (Streubert Speziale & Carpenter, 2007). Once quantitative data collection was completed, any identifying information was removed and identity codes were affixed. Interviews were audio-taped with permission, and transcribed by an independent transcriptionist. Participants could refuse to answer any question in the interviews or stop the interview at any time. Care was taken to ensure the identities of all participants (students and teachers) could not be determined in the presentation of qualitative data (i.e., through the use of pseudonyms and numbers). All data were kept confidential and stored in a locked filing cabinet or in password-protected computer files.

Every precaution was taken in this research study to protect the participants from physical or mental harm. Simulation objectives, expectations, and ground rules were given verbally and in writing during the videoconference presentation of maternal-

newborn theory, and reviewed again in the Orientation during the first hour of the practice lab to decrease any potential risk of student anxiety or stress.

The researcher had completed the Interagency Advisory Panel on Research Ethics Introductory Tutorial for the Tri-Council Policy Statement: Ethical Conduct for Research involving Humans. The study was approved by the Research Ethics Board (REB) at Athabasca University and the Research Ethics Committee at Confederation College (Appendix Q and R).

Summary

Within the context of a simulation-based practice lab, a mixed research design was used to study the instructional effectiveness of the practice lab (i.e., knowledge, skills, learner satisfaction, and self-confidence) and the promotion of a sense of connectedness with a learning community. A convenience sample of 42 practical nursing students participated in the simulation-based practice lab. Data were obtained by means of a demographic questionnaire, a 20-item pre-test/post-test knowledge quiz, and three instruments developed by the NLN (the SDS, the EPSS, and the Learner Satisfaction and Self-Confidence in Learning Scale), as well as from Rovai's (2002b) CCS administered before and after the simulation-based practice lab. Interviews were also conducted. Descriptive and inferential statistical analyses of the quantitative data were conducted. For the qualitative data, thematic analysis with a selective highlighting approach was used to identify common themes. Ethical considerations were also discussed.

CHAPTER 4

RESULTS AND DISCUSSION

The purpose of this study was to create an effective simulation-based practice lab in a blended distance practical nursing program in order to improve instructional effectiveness and increase students' preparedness for clinical practice as well as to promote students' sense of belonging to a cohesive learning community. The following research questions were addressed:

1. What effect, if any, does participation in a simulation-based practice lab have on the following outcomes of instructional effectiveness as presented in the Nursing Education Simulation Framework (Jeffries, 2007): knowledge, skills, learner satisfaction, and self-confidence?
2. What effect, if any, does participation in a simulation-based practice lab have on sense of connectedness as measured by Rovai's (2002b) Classroom Community Scale (CCS)?

The study used a mixed-method research design. Quantitative data were collected using a demographic questionnaire, a pre- and post-knowledge quiz to assess students' understanding of maternal-child theory, and Rovai's (2002b) CCS to measure the level of community cohesion before and after the simulation-based practice lab. Three NLN surveys were also administered to measure students' perceptions of simulation design, educational best practices, and learner satisfaction and self-confidence. Qualitative data were collected using semi-structured interviews with 27 students, three facilitators, and five clinical placement instructors.

Descriptive and inferential statistical analyses of the quantitative data were conducted. Thematic analysis with a selective highlighting approach was used for the qualitative data to identify common themes.

This chapter presents the results obtained from the data analyses and discusses the findings. It is divided into three main sections: (a) a description of the characteristics of the sample obtained in the study, (b) the results of the descriptive and inferential statistical analyses of the quantitative data, and (c) the thematic analysis of the qualitative data obtained in the study. A summary of findings concludes the chapter.

Characteristics of the Sample

This research study involved a convenience sample of 42 practical nursing students enrolled in the second semester of the first year of a two-year diploma program. Students were located across five regional campus sites in Northwestern Ontario: nine students were in Fort Frances, 12 in Atikoken, seven in Kenora, 10 in Dryden, and four in Sioux Lookout. Although 45 students were initially involved in the study, two students withdrew from the program and one student became ill just before the on-site simulation-based practice lab. As a result, a final sample of 42 students from five campus sites was obtained for the study.

Table 4 presents the demographic characteristics of the sample. Of the 42 students who participated in the study, 37 were females (88.1%) and five were males (11.9%). The age range was from18 to 50 years, with an average age of 30.2 years. None of the students had previous lab experience with simulators.

Table 4

Demographic Characteristics

Characteristic	Female	Male	Total
Gender			
n (%)	37 (88.1)	5 (11.9)	42
Age (Years)			
Mean	30.0	31.6	30.2
Range	18-50	25-39	18-50

Quantitative Analysis and Findings

Analyses were conducted of the data obtained from each of the following instruments: pre- and post-lab administrations of a knowledge quiz; the SDS; the Educational Practices Questionnaire; the Learner Satisfaction and Self-Confidence in Learning Scale; pre- and post-lab administrations of Rovai's (2002b) CCS.

Pre- and Post-Lab Knowledge Quiz

All students attended a two-hour class on maternal/newborn theory via two-way video conferencing held four weeks prior to the simulation-based practice lab and completed a 20-item knowledge quiz after the session. The same 20-item knowledge quiz was administered after the simulation-based practice lab.

Descriptive statistics were used to analyse knowledge gain based on students' passing scores (pass = 60% or higher). Prior to the simulation lab, 14 students passed the knowledge quiz; whereas, after the simulation lab, 30 students passed. The scores on the pre-test ranged from 20% to 75%, with a mean of 51.9%. The scores on the post-test ranged from 25% to 85%, with a mean of 62.4%. Figure 3 presents a histogram of the

pre-test and post-test scores, showing the increase in knowledge gain in the group as a whole.

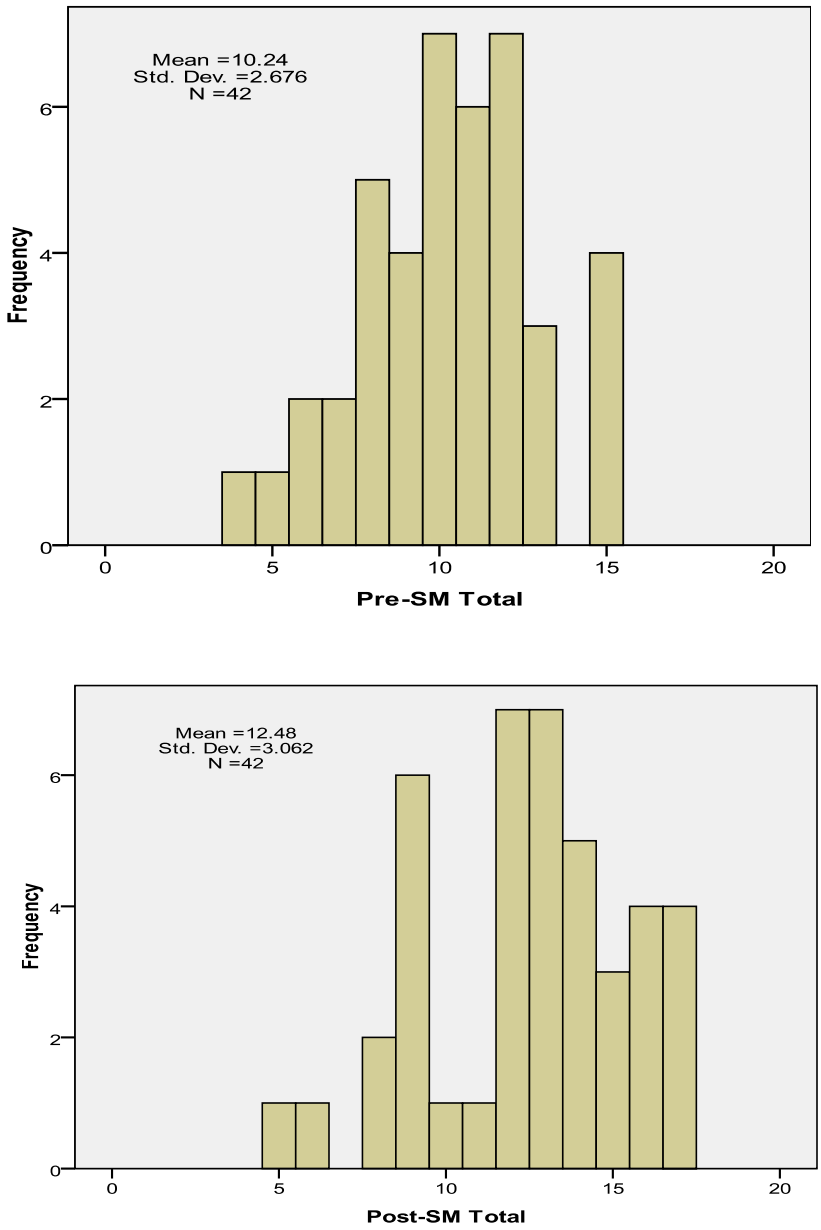


Figure 3. Scores on the pre- and post-simulation (SM) knowledge quiz.

When the means are calculated for the same participants at different points in time (e.g., for a pre- and post-test), a within-subjects, dependent *t* test is appropriate (Polit, 2010). A paired sample *t* test showed that the improvement in knowledge quiz scores was statistically significant (t (41) = -4.46, $p < 0.01$). The t-test resulted in a probability (p) value less than 0.01, indicating that the differences in the test scores were by association not due to chance (Polit, 2010).

National League for Nursing Instruments

The participants' perceptions of simulation design, educational best practices, learner satisfaction, and self-confidence in relation to the simulation-based practice lab were measured using three NLN instruments: SDS, EPSS, and the Learner Satisfaction and Self-Confidence in Learning Scale. The completed questionnaires were examined prior to data entry into the Social Sciences for Windows (SPSS) 17.0 program; there were no incomplete instruments or missing data.

Simulation Design Scale. Descriptive statistics were used to examine the subscale scores on both parts of the SDS questionnaire. Mean subscale ratings for the elements of the simulation design ranged from 4.25 to 4.76 (out of a possible score of 5.00). The overall high scores indicated that students perceived all of the following five design elements to be clearly present in the simulation-based practice lab: objectives and information, support, problem solving, feedback/guided reflection, and fidelity. Results for each simulation design subscale and for all 20 items are reported in Table 5.

The design feature receiving the highest presence score was Feedback with an overall mean score of 4.76. Students felt the feedback received in the simulation-based practice lab was constructive (M = 4.79) and provided in a timely manner (M = 4.79).

The lowest mean score (*M* = 4.17) was on the problem-solving design element, for the statement, “The simulation provided me an opportunity to goal set for my patient.”

Mean scores of the importance of the design features were slightly higher than the presence scores, and ranged from 4.44 to 4.78. The Feedback/guided practice (*M* = 4.72) and Fidelity (*M* = 4.78) subscales received the highest ratings of importance. Students rated constructive feedback (*M* = 4.81), real-life scenarios (*M* = 4.79), and real-life factors built into the simulation scenario (*M* = 4.79) as the most important features of simulation design. The lowest importance mean score (*M* = 4.17) was obtained on the problem-solving item, “Independent problem solving was facilitated.”

The size of the difference between students’ assessments of the presence of design elements and their importance provides an indication of improvements in the practice lab design and implementation. The list of design elements also gives direction to nurse educators when developing the simulation-based activities and scenarios; attention to planning is important to ensure that all the elements are present in the design.

The largest difference between the presence of the simulation design feature and its importance (0.41) was obtained for the Objectives and Information item, “The simulation provided enough information in a clear manner for me to problem-solve the situation.” This difference implies that the level of problem-solving needs to be considered when designing the simulation experience (i.e., basic versus complex problem-solving depending on whether the student is in the first or second year of the program).

Table 5

Ratings of Subscales and Items in the Simulation Design Scale (SDS)

Design Feature and Items	Presence (Mean)	Importance (Mean)	Difference
Objectives and Information	4.34	4.61	
1. Information provided at the beginning	4.27	4.60	0.33
2. Purpose understood	4.45	4.67	0.22
3. Information for problem-solving	4.19	4.60	0.41
4. Information provided during simulation	4.29	4.60	0.31
5. Cues appropriate	4.52	4.64	0.12
Support	4.46	4.60	
6. Timely support	4.43	4.62	0.19
7. Needs for help recognized	4.40	4.45	0.05
8. Supported by teacher	4.43	4.62	0.19
9. Learning process supported	4.62	4.74	0.12
Problem Solving	4.25	4.44	
10. Facilitate independence	4.29	4.31	0.02
11. Explore all possibilities	4.21	4.40	0.19
12. Designed for my level	4.19	4.45	0.26
13. Prioritize nursing assessment	4.40	4.57	0.17
14. Goal set for patients	4.17	4.50	0.33
Feedback/ Guided Reflection	4.76	4.72	
15. Constructive feedback	4.79	4.81	0.02
16. Timely feedback	4.79	4.69	-0.10
17. Analyze own behaviour	4.76	4.69	-0.07
18. Guidance from teacher	4.71	4.71	0
Fidelity (Realism)	4.61	4.78	
19. Real-life situations	4.57	4.79	0.22
20. Real-life factors built in	4.67	4.79	0.12

Educational Practices in Simulation Scale. The EPSS is a 16-item questionnaire used to measure the extent to which four educational practices were present in the simulations and the importance of each practice to the learner (Jeffries & Rizzolo, 2006). Descriptive statistical analyses were used to examine the educational practices subscales and the item responses on both the presence and importance parts of the questionnaire. Results for the four subscales and all 16 items of the EPSS are reported in Table 6.

Mean subscale scores for the presence of elements of educational practices ranged from 4.46 to 4.68 (out of a possible 5.00). Students perceived all four educational practices to be clearly present in the simulation-based practice lab: active learning, collaboration, diverse ways of learning, and high expectations. The educational practice subscale with the highest mean score was collaboration with a mean of 4.68. The items with the highest mean score indicated that students learned from comments made by the teacher (M = 4.81) and felt they worked together with their peers during the clinical simulation (M = 4.73). The lowest mean score was found in active learning as students felt they did not have the opportunity to put more thought into their comments during the debriefing session (M = 4.21).

Mean scores for the importance of the educational practices ranged from 4.48 to 4.54. While subscale scores indicated that diverse ways of learning (M = 4.54) was rated the highest in terms of importance, students rated learning from teacher comments (M = 4.74) and using simulation activities to make learning time more productive (M = 4.69) as the items of highest importance. The least important item was found in the active

learning subscale, “I received cues during the simulation in a timely manner,” which received a mean rating of 4.29.

Table 6

Ratings of the Subscales and Items in the Educational Practices in Simulation Scale (EPSS)

Educational Practices and Items	Presence (Mean)	Importance (Mean)	Difference
Active Learning	4.47	4.51	
1. Discuss the ideas	4.48	4.52	0.04
2. Debriefing participation	4.71	4.62	-0.08
3. Thoughts into comments	4.21	4.33	0.12
4. Clearly understand material	4.24	4.60	0.36
5. Learn from teacher comments	4.81	4.74	-0.07
6. Timely cues	4.49	4.29	-0.20
7. Discuss objectives with teacher	4.37	4.40	0.03
8. Discuss ideas and concepts with instructor	4.34	4.45	0.11
9. Instructor responses	4.31	4.52	0.21
10. Learning time more productive	4.81	4.69	-0.12
Collaboration	4.68	4.53	
11. Work with peers	4.64	4.54	-0.01
12. Work together in clinical situation	4.73	4.54	-0.21
Diverse Ways of Learning	4.57	4.54	
13. Variety ways of learning	4.57	4.59	0.02
14. Variety ways of assessing learning	4.57	4.51	-0.06
High Expectations	4.46	4.48	
15. Objectives clear and easy to understand	4.43	4.48	0.05
16. Instructor communication	4.51	4.50	-0.01

The largest difference between the presence of the educational practice and its importance was seen in the active learning subscale item, “There were enough opportunities in the simulation to find out if I clearly understood the material,” where a difference of 0.36was obtained. The size of the differences between students’ assessments of educational practices and the importance provides direction for future improvements in practice lab design and implementation.

Learner Satisfaction and Self-Confidence in Learning Scale. The Learner Satisfaction and Self-Confidence in Learning scale is a 13-item instrument with two subscales: *Satisfaction with Current Learning* and *Self-Confidence in Learning*. The *Satisfaction* subscale has five items designed to measure student satisfaction related to the simulation-based practice lab. The *Self-Confidence* subscale has eight items designed to measure how confident students feel about the skills they practiced and their knowledge about the care they gave to the patient simulation-based practice lab (Jeffries & Rizzolo, 2006).

Descriptive statistical analysis of the responses in the *Satisfaction* subscale revealed that mean scores for the *Satisfaction with Current Learning* ranged from 4.61 to 4.88. Student satisfaction was highest for the “teaching materials used in the simulation” item (M = 4.88), and lowest on the “the suitability in the way the instructor taught the simulation” item (M = 4.61). The overall mean subscale score was 4.74 (SD = 0.53) indicating that students were extremely satisfied with the simulation activity. Results for the Satisfaction subscale and all five items are presented in Table 7.

Table 7

Ratings for the Satisfaction Subscale

	Minimum Score	Maximum Score	Mean Score	Standard Deviation
Satisfaction with Current Learning			4.74	0.53
1. Teaching methods helpful	4	5	4.83	0.37
2. Variety of learning	3	5	4.64	0.53
3. Enjoy the instructor	3	5	4.76	0.48
4. Teaching materials	4	5	4.88	0.32
5. Suitable way for me to learn	1	5	4.61	0.79

Descriptive statistics were also obtained for the responses in the *Self-Confidence in Learning* subscale. Mean scores for the items ranged from 3.38 to 4.59 (out of a possible 5.00). Students gave the highest ratings of self-confidence on the item "It is my responsibility to learn what I need to know from this simulation activity" (M = 4.59), and the lowest ratings on the item "It is the instructor's responsibility to tell me what I need to learn of the simulation activity content during class time" (M = 3.38). The overall subscale mean score of 4.27 (SD = 0.73) indicated that students were generally confident in their ability to care for the patients in the scenarios presented in the simulation activity. Results for the self-confidence subscale and all eight items are presented in Table 8.

Table 8

Ratings for the Self-Confidence Subscale

	Minimum Score	Maximum Score	Mean Score	Standard Deviation
Self-Confidence in Learning			4.27	0.73
6. Mastering the content	2	5	4.09	0.65
7. Covered critical content	3	5	4.28	0.67
8. Skill development	3	5	4.38	0.53
9. Helpful resources	4	5	4.57	0.50
10. My responsibility	3	5	4.59	0.54
11. Know how to get help	3	5	4.45	0.55
12. Know how to use simulation	3	5	4.45	0.55
13. Instructor's responsibility	1	5	3.38	1.01

Classroom Community Scale

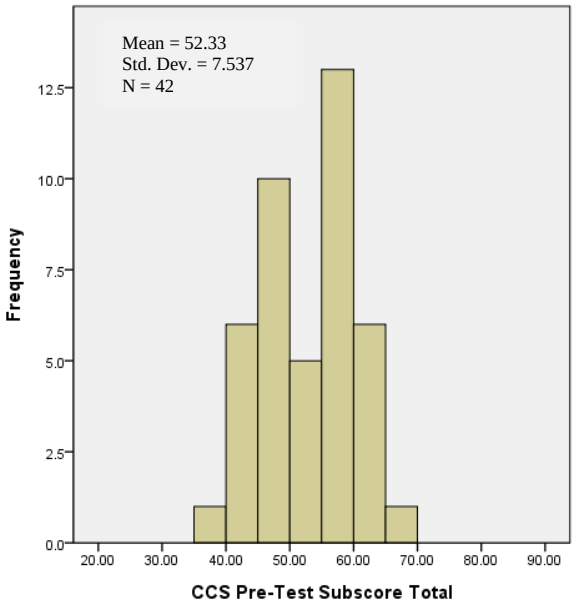
Classroom community was measured using Rovai's (2002b) 20-item survey before and after the simulation-based practice lab. The first administration of the CCS yielded a total score of 52.33 (out of a possible 80), with 25.19 (out of a possible 40) for the *Connectedness* subscale and 27.14 (out of a possible 40) for the *Learning* subscale. The second administration of the CCS indicated an overall increase. The overall score was 57.40, with 27.74 for the *Connectedness* subscale and 29.67 for the *Learning* subscale.

There was an increase from 25.19 to 27.74 for the *Connectedness* subscale and from 27.14 to 29.67 for the *Learning* subscale. A paired sample *t* test showed that the increase was statistically significant for both sub-scores ($t(41) = -4.460$, $p<0.01$). The pre-lab CCS score ($M = 52.33$, $SD = 7.53$) and the post-lab CCS score ($M = 57.40$, $SD =$

9.47) showed an increase in sense of community in the group as a whole (Figure 4). A paired sample *t* test showed that the difference between the CCS scores was statistically significant ($t(41) = -3.946$, $p<0.001$).

All students were invited to an informal social event in conjunction with the simulation-based practice lab. Due to scheduling and the size of the group, 23 students attended the social *after* attending the simulation-based practice lab and completing the CCS survey; whereas, 19 students attended the social and the simulation-based practice lab *before* completing the survey. Therefore, for the first group, the potential effect of attending the social event on the students' sense of community was not captured on the CCS.

A further analysis was conducted to determine if the social event had an effect on connectedness as measured by the CCS. An independent sample t-test was used to compare the mean post-test connectedness sub-scores of the "*Before* social" and the "*After* social" groups. Although there was a slight increase in the scores of the *after* group ($M = 28.22$), the difference was not statistically significant ($t(41) = -.661$, $p<0.513$). As a result, it was concluded that the increases in the CCS and subscale scores was attributable to the simulation-based practice lab activities themselves, and not to the evening social activities.



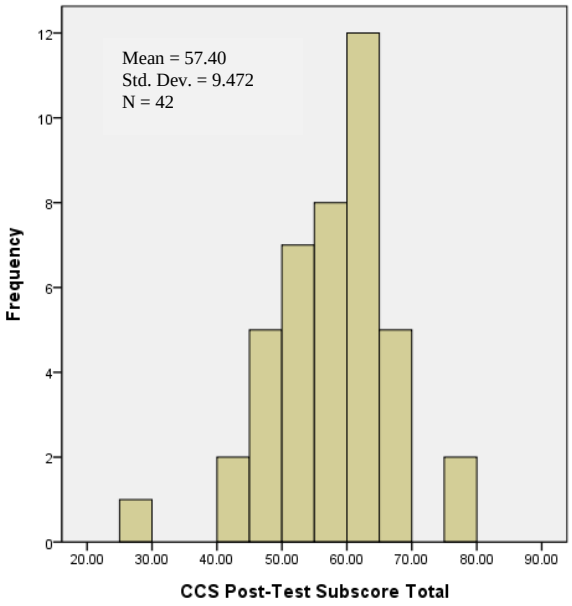


Figure 4. SPSS histograms generated from the overall CCS raw scores.

Qualitative Analysis

The qualitative part of this research study began with emailing interviewees prior to the interviews and continued through transcription, coding, and interpretation of the interview text. Data analysis started when data collection began (Speziale & Carpenter, 2007).

Three sets of transcripts were made: student, facilitator, and clinical placement instructors. In addition to the data collected in the transcripts, the researcher kept field notes during each telephone interview. Field notes describe what is heard or experienced by the researcher during the interviews that may not be captured by the voice recordings (Speziale & Carpenter, 2007). For example, one student had a bad cold but insisted on completing the interview when called. Another student had a child calling her, asking for her attention repeatedly during the interview, but she also wanted to finish answering the questions rather than be called back. In the remaining interviews, the researcher noted the presence of a quiet background, relaxed atmosphere while answering questions, eagerness to answer questions, and a positive tone of voice. These field notes were significant in the data analysis as they validated points made by the student and facilitated identification of themes that emerged during analysis (Speziale & Carpenter, 2007).

Student Interviews

Twenty-seven students originally responded to the letter of invitation and volunteered to be interviewed. Two students withdrew from the program reducing the number of interviewees to 25 out of 42 students (60%) volunteering to participate in a telephone interview. A digital recorder recorded each interview in its entirety. The 25 interviews yielded a total of 3.4 hours of student interviews. Student interviews ranged

from 5 to 21 minutes in length with an average time of 8 minutes. The student transcripts consisted of 45 double-spaced pages, a total of 15,487 words and 600 paragraphs.

Facilitator Interviews

The three nursing faculty members who assumed the role of facilitators in the simulation-based practice lab agreed to be interviewed. A digital recorder recorded each interview in its entirety. The three interviews lasted a total of 55 minutes. Facilitator interviews ranged from 17 to 20 minutes in length with an average time of 18.3 minutes. The facilitator transcripts consisted of eight pages with 4,504 words and 58 paragraphs.

Clinical Placement Instructor Interviews

The five part-time clinical placement instructors yielded a total of 3hours and 40 minutes of interview time. Clinical placement instructor interviews ranged from 8 to 9 1/2 minutes in length with an average time of 9 minutes. The clinical placement transcripts consisted of a total of four double-spaced pages, consisting of 1,587 words and 60 paragraphs.

Data Analysis

The researcher and a co-coder followed Bogdan and Bilken's (1998) basic manual coding procedures to generate themes and sub-themes. The coding was done in a sequence of five steps: data organization and immersion, identification of preliminary coding categories, revision and development of major codes (themes), identification of preliminary sub-coding categories, and revision and development of sub-codes (sub-themes). The preliminary findings are noted below:

Preliminary coding categories. The following 11 coding categories were originally identified by the researcher in the preliminary qualitative analysis of the

student interview transcripts: beneficial experience, developing communication skills, realism, confidence with skills, confidence with knowledge, positive experience, nervousness about new experience, classroom connectedness, benefits of the social, debriefing, and recommendations. In contrast, the co-coder generated eight preliminary coding categories for the student group: nurse-patient interaction, simulation design, confidence with skills, positive experience, meeting other students and teachers, learning from the debriefing, learning from the roles played, and theory to practice.

The researcher identified four preliminary coding categories for the facilitator group: mentor, facilitator, benefits, and simulation. The co-coder identified three categories: role of facilitator, guiding debriefing, benefits of technology.

The researcher identified three preliminary coding categories for the clinical placement instructor group: skill acquisition, self-confidence, and sense of community. The co-coder identified four preliminary coding categories: theory to practice, supportive learning, new opportunity, and wanting more simulation experiences.

Originally, the researcher identified 11 coding categories in the student transcripts while the co-coder identified 8. On closer examination 9 of the researcher's codes were similar to the co-coders' categories; the units of analysis were the same, but the codes were worded differently. Similar findings were evident for the facilitator and clinical placement instructor coding categories.

Disagreements or differences between the researcher and co-coder were addressed as follows: When the unit of analysis was the same (i.e., both coders identified the same phrase as important), but the code names were different (i.e., they were synonyms), the misalignment was not considered to be of concern and a common name was agreed upon

for the code. However, the remaining differences in the coding and categories needed to be addressed as they were potential sources of error in the study. In such situations, through a process of discussion and compromise, the researcher and co-coder achieved consensus and ultimately identified a set of consistent themes and sub-themes for the three sets of interviews as discussed below.

Thematic Analysis of Student Interviews

The thematic analysis of the student interviews yielded six themes and 15 sub-themes (Table 9). The number of codes (i.e., units of data or sentences) for each of the themes and subthemes is shown in Figure 5. Generally speaking, the number of codes reflects the comparative importance of a theme or sub-theme, as students tended to talk more about areas or issues that were important to them.

The largest number of codes was identified for the Supportive Learning theme, which includes statements indicating that students felt supported by other students and/or teachers in the simulation-based practice lab. Overall, students were very positive about the simulation-based practice lab experience. Nurse educators can look at these findings and use them to guide the development of their clinical simulation experiences. For example, support is provided to students during the debriefing sessions and therefore should be included in every simulation scenario. It is just as important to look at the subthemes. For example, while Supportive Learning had a greater number of codes than Nurse-Patient Interaction; however, Realistic Simulation design had a greater number of codes than Teachers Assisting with Learning.

Table 9

Themes and Subthemes (Student Interviews)

Themes	Subthemes
1.Benefits to Distance Learners	1. Proper Equipment 2. New Experience
2. Nurse-Patient Interaction	1. Hands on Practice 2. Realistic Simulation Design 3. Development of Communication Skills
3. Theory to Practice	1. Developing Clinical Skills 2. Increasing Confidence in Knowledge
4. Positive Experience	1. Initial Anxiety 2. Positive Environment
5. Sense of Community	1. Meeting Other Students 2. Meeting Other Teachers 3. Classroom Connectedness
6. Supportive Learning	1. Learning from Students in Small Groups 2. Teachers Assisting with Learning 3. Learning from Roles Played

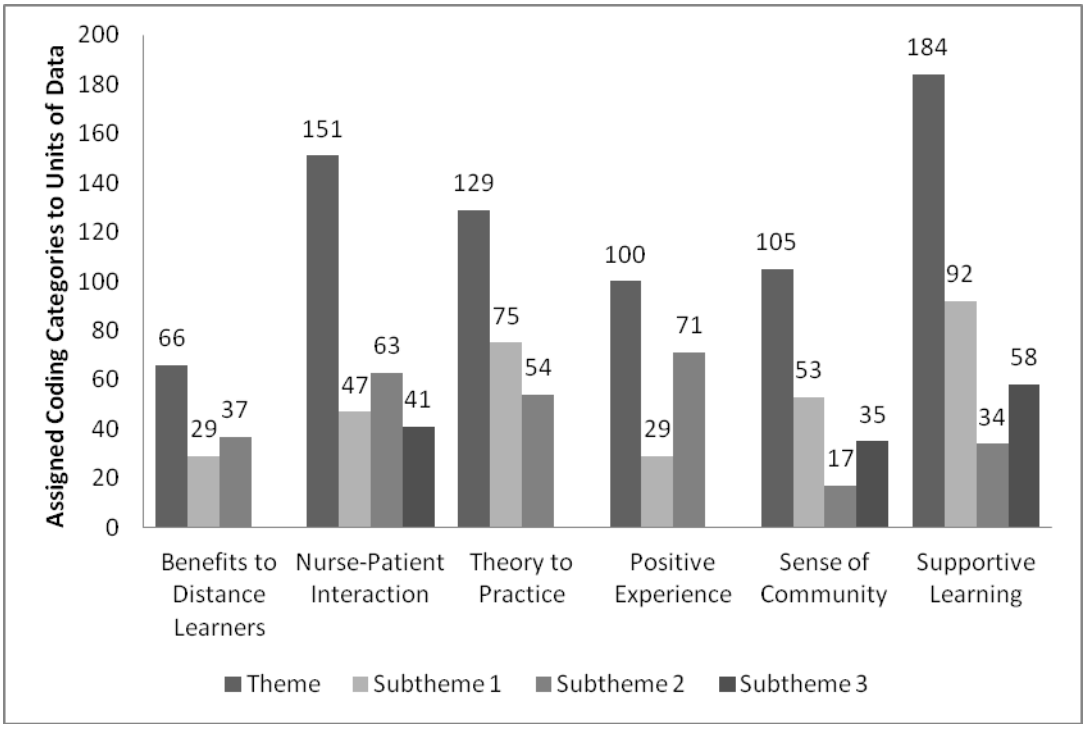


Figure 5. Themes and units of data in student interview analysis.

Theme 1: Benefits to Distance Learners

This theme pertained to the benefits the distance students gained by completing the simulation experience. A total of 66 codes were included in this category. Two subthemes were identified: the students' access to proper equipment (29 codes) and the availability of a new opportunity (37 codes). The students commented on the benefits that accrued when they were able to come together at the main campus and use new equipment in a simulated setting with other students and teachers. A problem with multi-site delivery of the practical nursing program is lack of equipment at the sites. The students were able to practice clinical skills (i.e., heart sounds and vital signs) with the mannequins prior to clinical in a safe, well-equipped environment. Students reported satisfaction with the simulated experience. Two students expressed excitement at the opportunity to use proper equipment:

> S1: I absolutely loved it and I think it is so beneficial to anybody especially people who live in the district because we actually got to use some equipment that was really kind of cool.

> S24: We have a mannequin but it doesn't do anything—it just kind of lays there and does nothing so it was really nice to see what all the other mannequins do like the heart beats and the breath sounds and that was my favourite part, was just playing with the mannequins, because we don't get to do that out here.

Another issue with multi-site delivery is the lack of consistent, high quality experiences for nursing students. Having the maternal-newborn content delivered to all the sites simultaneously and then coming together to experience the same clinical simulations was a benefit to distance learners. Two students referred to the simulation-based practice lab as a new opportunity to assist with their learning:

> S6: It was an awesome experience, something that I wouldn't get at the campus here.

> S17: I really liked the simulation dolls, like we don't have those here at our campus, so it was all new to us. It was just a really good experience and I really liked meeting the other people from the other campuses.

Theme 2: Nurse-Patient Interaction

This theme identified how the students perceived the simulation experience to enhance the effectiveness of nurse-patient interactions. A total of 151 codes were included in this category. Subthemes included (a) hands-on practice (47 codes), (b) realistic simulation design (63 codes), and (c) development of communication skills (41 codes). Some students expressed their appreciation of how the experience simulated the interaction between the nurse and the patient in a real, hands-on manner and comments on how it supported their learning and skill development. One student referred to the opportunity for obtaining hands-on-experience and the manner in which it contributed to her learning process in the following quotation:

> S3: I think just having to put it into practice is what makes it gel in your head. I mean its one thing to read it but when you actually have to verbalize it, even if it's just to a mannequin, verbalize the instructions to them and explain it; then it just makes it much more real.

Another student commented on the realism of the simulation scenarios. The closer the simulation experience is to the clinical environment the more it promotes learning:

> S16: I think one of the things that was good was actually being able to have like the scenarios, having someone act as the pregnant mother. The scenarios were like real. I mean, the scenarios were actually perfect because, you know, in a perfect world, its just not going to be really straightforward, right? So there were a few things thrown in there that made it more realistic. Everybody was able to interact as if it was real.

One student identified how the simulation scenarios helped with the development of communication skills, an important addition to the usual way skills were taught, and

further commented upon the high fidelity of the diagnostic cues presented by the mannequin:

> S14: Yeah, the simulation helped with communicating with others, I don't really think we had that before, so just bringing everyone together to do those scenarios kind of made us work a little more together. The lab also helped with checking the drainage and everything like that, that was good to actually see it, instead of you tell us what to look for, but when the teacher had it on the dolls— you kind of learned first hand.

Theme 3: Theory to Practice

This theme was associated with how the students perceived the simulation experience to help them link the theory they learned in the classroom to the simulated practice provided in the lab activities. A total of 129 codes were included in this category Subthemes broke the main code into two smaller categories: development of clinical skills (75 codes) and increased confidence and knowledge (54 codes). Students commented on the ability of the simulation-based practice lab to help them practice skills, gain knowledge, and develop confidence in a variety of nursing areas that they learned about in previous theory classes and from their textbooks. They expressed satisfaction with the outcome of the simulated experience.

Two students noted that the simulation experience gave them the opportunity to develop their clinical skills and increase their confidence in performing those skills:

> S4: Assessing the mother after a C-section -- that was very helpful. I learned to do chest sounds. We did the blood pressure and vital signs. We assessed the lochia and the BUBBLE-HE. I felt more confident in doing, and getting things done.

> S6: What I believe that the lab helped with was just some added skills and just some added direction how to handle a patient or client on a personal level and be professional at the same time, but yet, you know how you can put that… How would you put it?... Just your comfort and your compassion and your confidence.

> I was the nurse with the C-section scenario, I was nurse number one. Having that added role to do an overall assessment with the C-section mom was my first opportunity to be able to do so in that type of scenario, and so, I did learn some things that I could bring to my clinical placement.

One student discussed the increase in her knowledge from the simulation experience reinforced what they had learned in class. It helped them link theory to practice with a realistic scenario and environment:

> S13: The simulation experience helped me understand just by doing it. Like, we learned it all, we read it all, Mrs. M. taught us, and then we were able to put our hands on it, so it reinforced it more than I think it did just learning it in the classes. Like with the C-section part, that's something that I don't know if I'll ever get to be part of. But I just think just by being the nurse by doing that we're given just a little bit of experience, because it was very real.

Theme 4: Positive Experience

This theme pertained to the students' perceptions of the simulation as an overall positive experience. A total of 100 codes were included in this category. Subthemes separated the main code into two smaller categories: initial anxiety (29 codes) and positive environment (71 codes). Students were satisfied with the simulation experience despite their initial anxiety about performing and being observed in a lab setting. Students described feeling less anxious once they became familiar with the simulation-based practice lab experience and recognized the supports in place to facilitate their learning.

Two students identified an initial nervousness about participating in the simulation-based practice lab experience.

> S3: I just, um, I had um, to be honest with you I wasn't looking forward to the simulation experience, but when I went there and realized what it was, I just thought it was such a valuable learning tool. Maybe it was the travel a little bit. I enjoyed meeting the instructors. Just the energy with everybody, it was just a positive experience overall.

> S9: At first I was really nervous. We were the first ones up, the first ones of the day on the 9th, and I totally didn't know what to expect, but I thought it was great. I was just so pumped up afterwards that… it was just so much fun.

Three students referred to the feedback, constructive criticism, and support that created an overall positive environment and assisted with their learning. It is important for nurse educators to create a stress-free simulation environment that will promote student learning. Every student in the simulation-based practice lab that initially said they were nervous or anxious in the beginning of the experience talked about how the positive environment alleviated the nervousness for them:

> S8: You know what I felt was just, it was being able to say "Okay I"… the feedback was awesome, right? So, you go in and you know that you're not going to do it perfectly and you know that. But, being able to have somebody come back to you, very you know with constructive criticism—nobody was there to beat me down or whatever, so they were just suggestions that said, you know, these were the things that you did really, really well, but these are the things that we were kind of looking for, or that, you know, these are the situations that you might experience, and so these are the ways you could…deal with them.

> S12: The debriefing was almost the best part. Because you kind of got to go over everything—what went wrong, what didn't go so well, and just kind of letting things sink in and…I was really nervous to go, but once I got there it was great. It was a positive experience.

> S22: I found the simulation experience was really stressful because the first nurse didn't really know what to delegate, so we both looked at each other like, "Oh my god, there's a baby coming out!" But we did help each other, and the teacher gave us some hints.

Theme 5: Sense of Community

This theme identified the students' perception of the effects of the simulation experience on community cohesion. A total of 105 codes were included in this category. Subthemes broke the main code into three smaller categories: (a) meeting other students (53 codes), (b) meeting teachers (17 codes), and (c) classroom connectedness 35 codes). Following each scenario, the students met to "debrief" or discuss the simulation

experience. Some students commented positively on the benefits of working in groups, getting to meet their distance classroom teacher and new teachers in the scenarios, as well as coming together as a class.

One student identified the benefits of working in a group and meeting her distance classroom teacher. Collaborative learning enhances knowledge and skill development. Students spoke of learning from each other from observing what other students did in the simulation experience or by problem-solving together:

> S3: Um, you know I enjoyed working in a group because like I said we hadn't met anybody beforehand and also it was funny because sort of after the very first one then we immediately bonded. Because you know one person turned mid-way and said, "Oh, I wouldn't have done that" or "Thank goodness you did that!" You know? So that brought that out amongst us right away, and, you know the chuckling and probably because we had Mrs. M. first who is our distance classroom teacher, and that probably helped. You know because she was able to get that going knowing us too, but, yeah, that was, I thought that was really positive and she was really stressing the teamwork part of it. Yeah, so then the next time I went in, for the next scenario, you know, we were able to build on that I think.

Two students expressed how good it felt to meet the other students from their distance video conference classes. While students do connect in their theory classes via video conferencing each week, they don't always "see" each other as they would in a face-to-face environment. Sometimes not all students in the campus classroom can be seen on screen because of the way the students sit in a classroom, or the picture is blurry. Students in a distance video conferencing classroom can still feel isolated or disconnected from the class. Students spoke positively about being able to see fellow distance students in a face-to-face environment simulation-based practice lab:

> S4: I think it was good to see who you—like put faces to voices that you hear. And we were able to compare our sites and what we are learning and how we're doing things and different facilities that we have available and what we're able to

> do at our site. I think we kind of felt a bit more comfortable with everybody after that in class.
>
> S13: It was nice to get to meet everybody and I put faces to the names and to the voices that we hear and I think a lot of us from Atikokan—I'm not sure about the region—but, we meet up with people on Facebook now, and we're starting to form bonds with people in Dryden and Kenora. We had a distance class after the lab and we were able to see them and we were able to point them out. I had no idea who they were other than, you do know them like you can see who's talking but, yeah, you know a little bit more about them and their personalities too, so when something's funny but we're not catching on, you know? So this kind of brought us together.

One student identified a sense of connectedness as a class:

> S16: Meeting the other students in person made us feel like a class actually. Like it was good to get everybody down there, and you know, doing the same lab. It was really, really good.

Theme 6: Supportive Learning

This theme pertained to the supports the students felt they received during the simulation-based practice lab. A total of 184 codes were included in this category. Subthemes broke the main code into three smaller categories: (a) learning from students in small groups (92 codes), (b) teachers assisting with learning (34 codes), and (c) learning from the roles played (58 codes). Each lab group was composed of students from different campuses who had never met in a face-to-face environment before. Roles were assigned to each student and then changed as students rotated through the scenarios. Many students described their satisfaction with working in small groups. Students reported satisfaction as they commented positively on how the students in their group, the teachers, and the roles they played reinforced their learning.

> S5: Playing the role of the nurse helped me because it, once again, put a theory to practice and its hands on, actually being in the situation rather than just reading about it. Even though it was a simulation, you're still doing the skills. It helped me with organization.

> S10: Other students helped with my learning. I know in the infant part of it, when we had to do it… The instructor that was there actually asked us a whole bunch of questions in regards to, you know, things that you would look for, for the infant, things that you should watch for and stuff like that. It was actually beneficial because it kind of seemed like a jeopardy type thing—we would speak out in front of the other students. They would know the answers, so that was definitely, we worked together and helped each other. In the debriefing, the instructor actually made us feel awesome. They were all good. Said there were no right, no wrong questions that… we were still learning.

> S16: I think Mrs. M and Mrs. H debriefing went really well. I mean, they basically said that, you know they would go through all the good things first and the good things that everybody did throughout the scenario and then they would say, "Okay, well these are some things that needed to be done, we just brought them up as a main point for everybody," like it wasn't really directed at one person in general. So that went really well. The teachers made us comfortable and feel at ease.

The social event. All 42 students attended the social on Friday evening; however, 19 students had completed the simulation-based practice lab activities and filled out the CCS instrument prior to attending the social event. Statistical analysis revealed that there was no significance difference in the CCS connectedness subscale scores between those who attended the social before completing the CCS and those who did not. As such, it was concluded that the significant increase in learners' sense of connectedness was attributable to the simulation-based practice lab, rather than to the informal social get-together. Nevertheless, students identified positive outcomes associated with the social event in the interviews, particularly the opportunity to meet their previously virtual classmates in person and identify shared concerns and interests. For example, the following statements were made with regard to the social event:

> S8: It was nice to meet everybody else and it was really nice to know that we weren't alone in some of our anxieties, of, you know, oh my gosh, we're so busy and so overwhelmed and so it was interesting to just talk to the other sites and see how they were doing in their course and some of the things they were experiencing and…like, you know, we're all going for the same thing, so it was

just really good to put a face to a name and be able to say to them, you know, "Hi, how are you," and, you know, it just made it a bit more personal.

S15: Well, people look differently on screen rather than in person, I'll tell you that. At the social, I was able to talk with others in my class, including Mrs. M. She teaches us and we got to talk to her and other students and it was great all around.

S22: We had the social after [the practice lab], but it was a really great experience to look around and see all the other people, like we've been hearing over a microphone or you see on a video every once in a while. It was really nice to be able to talk to them.

S25: The social was neat. We actually got to see who we talk to on TV everyday. We actually got to know each other a little bit which was nice.

Thematic Analysis of Facilitator Interviews

The facilitators were very positive about the simulation-based practice lab experience. Three themes emerged from the qualitative analysis of the interviews with the facilitators. Table 10 and Figure 6 present the themes and subthemes for the facilitator group.

Table 10

Themes and Subthemes (Facilitator Group)

Themes	Subthemes
1. Benefits of simulation experience	1. Student benefits 2. Facilitator benefits
2. Facilitator role	1. Past experience 2. Supporting students 3. Guiding the debriefing
3. Technology	1. Comfort with the technology 2. Preparation for using the technology

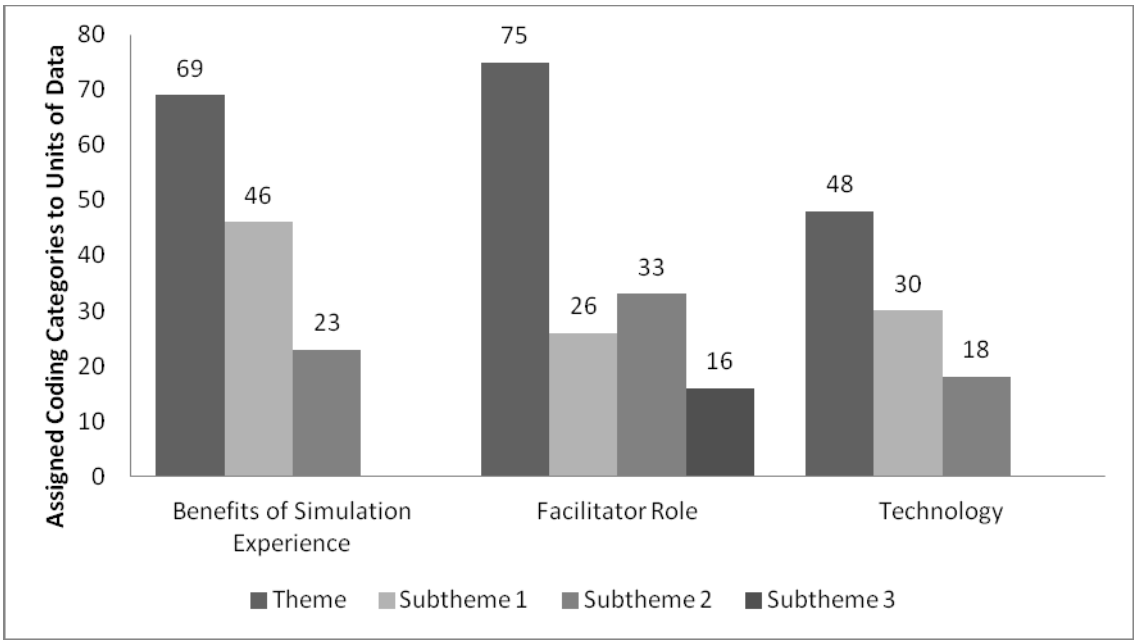


Figure 6. Themes and units of data in facilitator interview analysis.

Theme 1: Benefits of Simulation Experience

This theme identified the facilitator's perceptions of benefits the simulation experience afforded the students. A total of 69 codes were included in this category Subthemes broke the main code into two smaller categories: student benefits (46 codes) and facilitator benefits (23 codes). The facilitators in the simulation-based practice lab commented on the benefits that distance students received (such as hands-on opportunities, knowledge gain, and collaboration) when they were able to come together at the main campus and use new equipment in a simulated setting with other students. Comments from the facilitators identified how appreciative the students were to take part in the simulation and how they appreciated the experience as well. Benefits of the simulated experience appear in the excerpts below.

> F1: I found the simulation experience extremely rewarding. I felt that the students really benefitted coming to Thunder Bay and participating with the simulation exercises that we did. It was really nice to have them come and have supper and meet with them and just sort of share their stories and get to know them. And working with the students and having the groups move through – the comments were generally very, very positive. They appreciated all of the equipment; they appreciated the hands-on opportunities that they had with the various scenarios that I was involved with. And I really, really saw the benefit with the learning and the application of learning when we debriefed afterward each scenario and had a chance to talk about everything.
>
> F2: It was wonderful to see the students. I've been teaching this class of students for the last year and I've never really seen them face-to-face as I've been teaching them through distance education by video conferencing. So it was really great to actually get the opportunity to see them face-to-face and to work with them in the scenarios. It was really a great experience for me. It really just helped me to make a connection with those students. And I think it was really a good opportunity to see what knowledge they actually gained in the classroom. So, we actually developed the scenarios based on the content that they were covering in class. And they were basically in a situation where they had to apply the knowledge that they gained in class in the actual practical scenario.

Theme 2: Facilitator Role

This theme identified the facilitator's perceptions of their role in the simulation experience. A total of 75 codes were included in this category Subthemes broke the main code into three smaller categories: (a) past experience (26 codes), (b) supporting students (33 codes), and (c) guiding the debriefing (16 codes).

> All three facilitators were well versed in maternal-newborn content. Altogether their combined number of maternal-newborn nursing experience totalled 71 years.

The facilitators in the simulation-based practice lab commented positively on their role in supporting students throughout the simulation experience and guiding them in the debriefing process. Providing opportunities for students to problem-solve assists them in the learning process. The facilitators spoke about guidance, cues, and comfort in their roles. Facilitators reported satisfaction with the simulated experience.

> F2: I think it's really important that the teacher sets the stage at the beginning of the scenario and the students know that it is a non-threatening type of an encounter. It is a support thing and the students will know as well at the beginning that they are supporting each other and I always throw in the fact that making a mistake sometimes helps you learn more because you often will not want to repeat that mistake. And I've done a lot of reading in regards to design of scenarios and the debriefing. And I think as I've said before I think the debriefing is the key. It really draws on student knowledge, and I really try to step back and let the students debrief on their own as much as possible. I might give them some hints to lead them on but I think that during that debriefing period they help each other, and it really involves them working together and helping each other learn.

> F3: I feel very comfortable in the facilitation role. I've been teaching long enough. I have a ton of clinical experience, so I feel quite comfortable talking on the spot if I need to or answering student's questions on the run. I tend to probe the students to give them a bit of support, to encourage them to come up with the answer or truly think critically what the next intervention should be that they would do. I also feel comfortable with debriefing—talking as a group, how should we do this better, if we had another chance to go over this again, what did we learn, and what did we find hard.

Theme 3: Technology

This theme pertained to the use of the simulation technology. A total of 48 codes were included in this category Subthemes broke the main code into two smaller categories: comfort with the technology (30 codes) and preparation for using the technology (18 codes). The facilitators in the simulation-based practice lab expressed satisfaction with their knowledge of and preparation for using the technology in the simulation-based practice lab. They were very positive about the simulated experience that they provided for the students.

> F1: We had met prior to the simulation experience and set up the lab to go over the equipment and go over the scenarios and those were all actually provided to us earlier so that I could see just what my role was and rehearse and learn and review accordingly and appropriately so that I was able to function as effectively as I could in my role as a facilitator. I only required that the computer help people come down and give me a hand with the filming of the actual scenario. It was all set up for me but just with regards to my watching the actual scenario on the computer behind the drapes where I was situated I needed them to just come in

and show me the on and off button for the record, the pause, or the rewind, etc. And it really wasn't difficult to learn, and that was all that was required.

F3: So as far as the comfort level with the simulation, I thought it was fine. As far as the technology goes, I think there is a bit of a learning curve for people in that area. Most of the technology was related to Noelle and newborns and then just the moderate fidelity mannequins for the C-section kind of thing; which I felt was pretty straightforward to use. Certainly Noelle is easy to use; you can take her through the whole labour and delivery process quite easily. I've used the technology before and felt comfortable with it. Overall I think I have to say it was quite a good experience.

Thematic Analysis of Interviews with Clinical Placement Instructors

The clinical placement instructors worked with the students in the clinical area after the students completed the simulation-based practice lab experience. They commented that the experience had positive outcomes for their students. Three themes emerged from the interviews with the clinical placement instructors. Table 11 and Figure 7 present the themes and subthemes for the clinical placement instructors group.

Table 11

Themes and Subthemes (Clinical Placement Instructors Group)

Themes	Subthemes
1. Theory to practice	1. Developing clinical skills 2. Increasing confidence in knowledge
2. Positive experience	1. Requesting more simulated experience 2. Decrease in anxiety
3. Sense of community	1. Meeting other students 2. Supportive learning

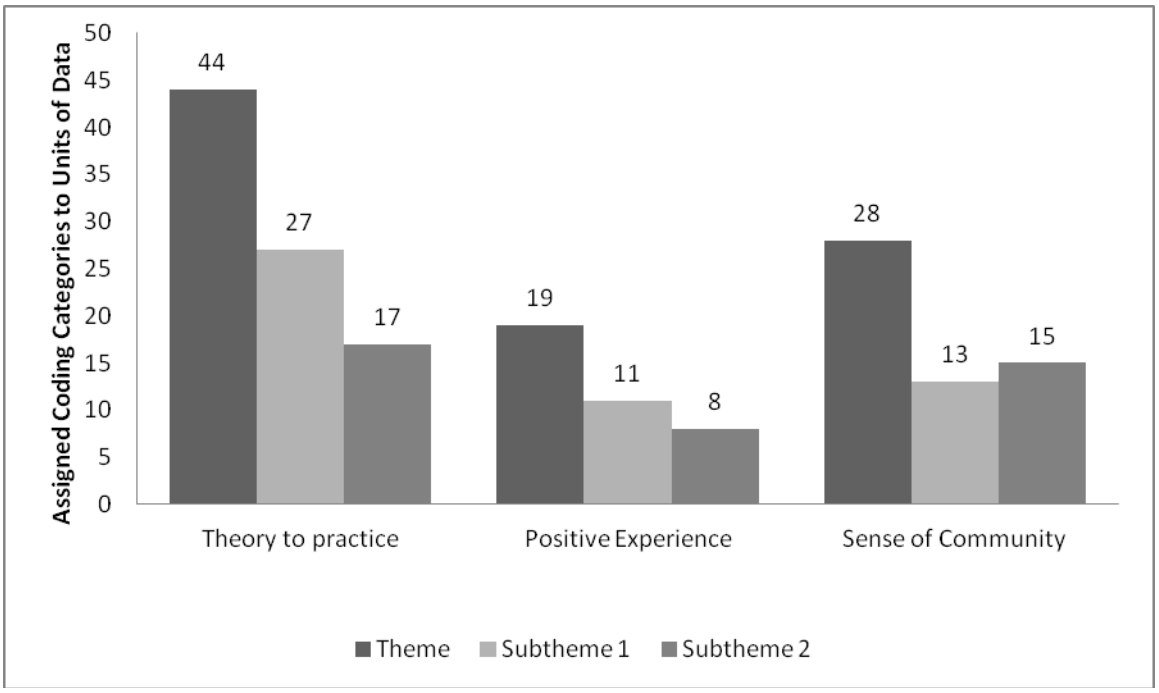


Figure 7. Themes and units of data in clinical placement instructors interview analysis.

Theme 1: Theory to Practice

This theme pertains to how the clinical placement instructors perceived the simulation experience to have helped the students link the theory they learned in the classroom and the clinical simulation experience to the clinical area. A total of 44 codes were included in this category. Subthemes broke the main code into two smaller categories: developing clinical skills (27codes) and increasing confidence in knowledge (17 codes). The clinical placement instructors reported that they felt the students' nursing skills and their confidence levels had improved following the simulation-based practice lab. They expressed satisfaction with the simulated experience in assisting the students with their learning:

> CPI1: The hands-on experience was excellent for them and the liked that part of the lab experience. Their self-confidence showed when they came back to clinical.
> CPI2: In the medical-surgical areas, their organizational and assessment skills improved after the lab and are great. Almost all my students have been through the one day Maternity rotation now, and they have all commented on how they can relate what they did in the Maternal-Infant lab in Thunder Bay to the maternity work. They say the pieces are falling into place. They can see how it all made sense now. Some students have even had a client who had a C-section, which was one of the scenarios in the lab. They told me that was not their expectation before they went to the lab because they did not know what to expect. But they see now how it all fits and really made a difference.
>
> CPI4: Their organization skills and communication skills improved. They loved the way the lab was organized; that it was okay to ask questions. They had an increase in their self-confidence too. The students were impressed with themselves afterwards on how much they had learned.

Theme 2: Positive Experience

This theme was associated with the facilitator's perceptions about the students' feelings that the simulation-based practice lab was a positive experience. A total of 19 codes were included in this category Subthemes broke the main code into two smaller categories: requesting more simulated experience (11 codes) and decrease in anxiety (eight codes). The clinical placement instructors reported that the students felt the experience was positive and wanted it to be repeated in the future. Their comments expressed how much the students had learned from it but that they had enjoyed it immensely as well. They expressed satisfaction that the simulated experience had been a positive experience and hoped it would be repeated as well.

> CPI1: The students really enjoyed the experience and would like to do it again. In fact they asked the coordinator in lab class the other day if they could do it again. The kids loved the simulation lab, and want to do it again—so keep doing it…it was great.
>
> CPI2: You know I'll tell you that the students came back from the Maternal-Infant Lab saying that they extremely enjoyed it. In fact they are still talking

> about it; they wish they could go back and do another one. They loved working with the equipment and mannequins. They got a lot out of it.
>
> CPI3: I do remember that they were nervous before they left to go to the lab and they said they were not nervous once they got into the lab activities. They enjoyed the lab in Thunder Bay a lot and learned a lot from it.

Theme 3: Sense of Community

This theme pertains to the facilitator's perceptions of the effect that the simulation experience had on the students' sense of community cohesion. A total of 28 codes were included in this category. Subthemes broke the main code into two smaller categories: meeting other students (13 codes) and supportive learning (15 codes). The clinical placement instructors reported that the students felt the experience provided them an opportunity to meet new people and learn collaboratively with the other students from other campuses. They expressed satisfaction in knowing that this simulation-based practice lab opportunity helped their learning.

> CPI1: Before the students went to Thunder Bay for the lab they were really excited about it because they see everyone on video and did not really know people. Then when they came back they said they got to meet people one-on-one and meet all the teachers from Thunder Bay as well. They felt more like a whole group.
>
> CPI4: The lab seemed to enhance their teamwork. They did say after they came back that they felt like one big class and wished they could have another lab like that. They liked having roles to play in the scenarios and felt they learned from playing that role and observing other students play their roles. They felt supported by the teachers and the other students that they worked with.
>
> CPI5: The students told me they really enjoyed the lab actually. They had finally got to meet everybody in their class in the lab in Thunder Bay. I think this was good actually because I think they felt separated from everyone else before that. They enjoyed working with the other students and said they learned from working with them in the scenarios.

Triangulation of Findings

A mixed-method research design was used in this study to investigate the instructional effectiveness and community cohesion associated with a simulation-based practice lab in a blended distance nursing program. The most common mixed-method design is a triangulation design in which the researcher collects both quantitative and qualitative data (Lodico, Spaulding, & Voegtle, 2006). Triangulation is defined as "the use of two or more methods of data collection in the study of some aspect of human behaviour" (Cohen et al., 2007, p. 142). Cohen et al. (2007) indicate that triangulation can provide the researcher with two important advantages. First, it allows the researchers to go beyond single observation and achieve confidence in the results when different methods of data collection produce similar results. Second, the use of multiple methods helps researchers who rely only on one particular, familiar methodology – the problem of "methodboundedness" (Cohen et al., 2007, p. 142). Jick (1979) identifies a third advantage of triangulation, one that goes beyond reliability or validation. Triangulation provides a more complete or holistic view of the data being studied. It may also "uncover some unique variance which otherwise may have been neglected by single methods" (Jick, 1979, p. 603).

Triangulation of Quantitative and Qualitative Data

The triangulation of the findings from the quantitative and qualitative analyses can identify similarities between the results and help to confirm findings and provide answers to the research questions. Differences or discrepancies may suggest areas for further study. The results of the qualitative and quantitative analyses

complemented each other and added a rich, descriptive understanding of how a simulation-based practice lab can promote instructional effectiveness and community cohesion. The triangulation of the quantitative and qualitative findings is presented below.

Instructional Effectiveness

Triangulation of the quantitative and qualitative data analyses revealed similarities between the results of the SDS and Educational Practices Questionnaire and the narratives about instructional effectiveness obtained from the interviews. The quantitative analysis provided strong support for the instructional effectiveness of the simulation-based practice lab. Overall mean scores for the five subscales in the SDS ranged from 4.25 to 4.76 indicating that students perceived the presence of all five design elements in the simulation experience. Overall mean scores for the four subscales in the EPSS ranged from 4.46 to 4.68 indicating that students perceived the presence of all four educational practices to be present in the simulation-based practice lab experience. The qualitative analyses of the student, facilitator, and clinical placement instructor interviews revealed a number of themes related to instructional effectiveness, as described below, and helped to confirm and add detail to the quantitative results.

- In the *Supportive Learning* theme, students commented positively about how their learning was reinforced by the small group activities, the teachers, and the roles they played in the scenarios. For example, “Playing the role of the nurse helped me … put a theory to practice and it’s hands-on — actually being in the situation rather than reading about it.”

- In the theme pertaining to *Facilitator Role,* facilitators referred positively to their role in supporting students throughout the stages of the simulation-based practice lab experiences from setting up the scenarios to the debriefing sessions afterwards, making comments such as, “I think it’s really important that the teacher set the stage at the beginning of the scenario” and “I think the debriefing is the key. It really draws on student knowledge, and I really try to step back and let the students debrief on their own as much as possible.”
- In the *Theory to Practice* theme, the clinical placement instructors noted that their students returned from the simulation-based practice lab saying that they loved the way the lab was organized. One instructor said that her students had been impressed with how much they had learned from the simulation lab.

Knowledge gains. Triangulation of the quantitative and qualitative data revealed similarities between the results of the pre-and post-lab knowledge quiz and the narratives about knowledge gain obtained from the interviews. Overall there was an increase in knowledge gain in the group as a whole (14 students passed the pre-test; while after the simulation lab, 30 students passed the post-test). A paired sample *t* test (M = -2.23, SD = 3.25) showed this improvement to be statistically significant ($t(41) = -4.46$, $p<0.01$). The narrative accounts of student, facilitator, and clinical placement instructor interviews revealed a number of themes related to knowledge gain:

- In the *Theory to Practice* theme, students commented on how the simulation-based practice lab reinforced what they had learned in class. For example, “It reinforced it more than I think it did just learning it in the classes.”

- In the *Positive Experience* theme, students recognized supports in place during the simulation-based practice lab to facilitate their learning. For example, "I thought it was such a valuable learning tool."
- In the *Benefits of Simulation Experience*, facilitators commented on the knowledge students had gained from taking part in the simulation scenarios and the debriefing sessions afterwards. For example, "We actually developed the scenarios based on the content that they were covering in class. They were in a situation where they had to apply the knowledge that they gained in the class in the actual practical scenario."
- In the *Positive Experience* theme, the clinical placement instructors reported on how the students had commented that they had learned a lot from the simulation experience.

Skill development. The simulation-based practice lab provided a safe, realistic environment in which nursing students could comfortably and competently develop their skills prior to clinical placement. The feedback/guided reflection and fidelity (realism) subscales of the SDS survey and the self-confidence in learning subscale from the Learner Satisfaction and Self-Confidence in Learning survey addressed students' perceptions of skill development in the simulation-based practice lab. Triangulation of the quantitative and qualitative data analyses revealed similarities between the results of the NLN instruments and the narratives about skill development obtained from the interviews, which helped to confirm the findings of the quantitative analysis and add to the understanding of the processes involved in the increased knowledge and skill levels. The overall high ratings for the three subscales indicated students perceived the

opportunities were present for skill development. For example, "The simulation allowed me to analyze my own behaviour and actions" (*M* =4.76), "Real life factors, situations, and variables were built into the simulation scenario" (*M* = 4.67), and "I am confident that I am developing the skills and obtaining the required knowledge from this simulation to perform the necessary tasks in clinical" (*M* – 4.38). The narrative accounts of student and clinical placement instructor interviews revealed themes related to skill development. For example:

- In the *Nurse-patient Interaction* theme, students expressed their satisfaction with how the practice lab simulated the interaction between the nurse and patient in a real, hands-on manner which provided an opportunity for them to practice and develop their skills.
- In the *Theory to Practice* theme, clinical placement instructors reported that they felt that the students' organizational and communication skills had improved following the simulation-based practice lab.

Learner satisfaction. Triangulation of the quantitative and qualitative data revealed similarities between the results of the Learner Satisfaction and Self-Confidence in Learning survey and the narratives about learner satisfaction obtained from the interviews. The overall mean of the *Satisfaction with Current Learning* subscale was 4.74 indicating that students were highly satisfied with the simulation-based practice lab. For example, a mean rating of 4.83 was found for the item, "The teaching methods used in this simulation were helpful and effective." The qualitative analysis of the student, facilitator, and clinical placement instructor interviews revealed a number of themes related to learner satisfaction as discussed below.

- In the *Benefits to Distance Learners* theme, students reported satisfaction with the using new and proper equipment in the simulation experience in Thunder Bay. For example, "I absolutely loved it and I think it is so beneficial to anybody especially people who live in the district."
- In the *Positive Experience* theme, students stated they were satisfied with the simulation experience despite their initial anxiety about coming to Thunder Bay and being observed by teachers in a lab setting.
- In the *Benefits of Simulation Experience* theme, facilitators reported student appreciation of all the new equipment in the simulation experience, as well as the hands-on opportunities that they had in the various scenarios.
- In the *Positive Experience* theme, clinical placement instructors stated their students came back from the lab experience saying that they had enjoyed it immensely and had loved working with the equipment and mannequins.

Self-confidence. Triangulation of the quantitative and qualitative findings revealed similarities between the results of the Learner Satisfaction and Self-Confidence in Learning survey and the statements about student's self-confidence obtained from the interviews. The overall mean for the *Self-Confidence in Learning* subscale was 4.27 (out of 5.00) indicating that students were generally confident in their ability to care for the patients in the obstetrical scenarios presented in the simulation-based practice lab. For example, "I am confident that I am mastering the content of the simulation activity" (M = 4.09). The narrative accounts of student, facilitator, and clinical placement instructor interviews revealed a number of themes related to learner self-confidence:

- In the *Theory to Practice* theme, students reported confidence in their knowledge and skills after doing them in the simulation experience. For example, "We did the blood pressure and vital signs. We assessed the lochia and BUBBLE-HE. I felt more confident in going and getting things done."
- In the *Benefits of Simulation Experience* theme, facilitators commented on student benefits of the simulation experience. For example, "There is so much capacity to learn and what I find during the debriefing with the students, I can just see light bulbs clicking. And I can see how effective it is as a learning strategy. I can see how confident they've become."
- In the *Theory to Practice* theme, clinical placement instructors reported that their student's self-confidence showed when they came back to clinical after the simulation experience.

Community Cohesion

Triangulation of the quantitative and qualitative data analyses revealed similarities between the results of the CCS and the narratives about community cohesion obtained from the interviews. There was a statistically significant difference in the pre- and post-tests for the *Connectedness* and *Learning* subscales. The overall CCS score for the pre- and post-test showed an increase in sense of community in the group as a whole. The narrative accounts of student, facilitator, and clinical placement instructor interviews revealed a number of themes related to community cohesion:

- In the *Sense of Community* theme, students commented positively on working in groups, meeting their distance classmates in person, and coming together in a face-to-face environment as a class. For example, "It was nice to get to meet

everybody and put faces to the names and to the voices that we hear," and "Meeting the other students in person made us feel like a class."

- In the *Benefits of Simulation Experience*, one facilitator commented on the bonding that took place after taking part in the simulation scenarios for both the students and herself, "We had different students from different campus site, regional campus sites, in different groups for the scenarios. And I think it help them to sort of bond a little bit more together," and "Going to class (video conference) after the scenario with the same students…I was able to connect with them a little bit more."
- In the *Sense of Community* theme, the clinical placement instructors reported on how the students had felt the experience provided them an opportunity to meet and learn with the other students in their class from other campuses. For example, "They had finally got to meet everybody in their class in the lab in Thunder Bay. I think this was good actually because I think they felt separated from everyone else before that. They enjoyed working with the other students and said they learned from working with them in the scenarios."

Unique variance. Jick (1979) notes that triangulation of quantitative and qualitative data can sometimes uncover a unique variance that may have been missed or neglected by a single method that can enrich or enhance the findings. The narrative accounts of the student interviews revealed that in addition to positive responses in all aspects of the simulation-based lab experience, students requested the opportunity for more experience overall or for more varied experiences. For example, "I would really liked to have more simulation, like have it a full day because

there was other mannequins that were there and it would be great to do more," and "I wish there was another lab for us to do, like for our last year, at some point for anything. I thought it was a really good lab." One reason for the single-method finding can be attributed to the format of the quantitative surveys (statements with Likert Scales) compared to the open-ended interview questions which allowed for additional responses. This result can lead to recommendations for future simulation experiences and further research.

Divergence. There can be dissimilar results in multi-method analysis which lead to unexpected findings. Jick (1979) notes that divergence can become an opportunity for enriching the explanation of the findings. One unexpected finding in the study's results pertained to the informal social event that took place Friday evening. Nineteen students attended the social and the lab experience *before* completing the survey; 23 students attended the social *after* completing the survey. To determine if the social event had an effect on connectedness, an independent sample t-test was used to compare the mean post-test connectedness sub-scores of the *before* and *after* groups. Although there was a slight increase in the scores of the *after* group (M = 28.22), the difference was not statistically significant (t (41) = -.661, p<0.513). As a result, it was concluded that the increases in the CCS and subscale scores was attributable to the simulation lab activities themselves, and not to the evening social activities. However, narrative accounts provided support for the social event or greater understanding of its role as student interviews revealed positive outcomes. For example, "At the social, I was able to talk with others in my class, including Mrs. M. Mrs. M. teaches us and we got to talk to her and other students and it was great all around," and "We had the social after

but it was a really great experience to look around and see all the other people, like we've been hearing over a microphone or you see on a video every once in a while. It was really nice to be able to talk to them."

The results of this mixed methods study generates a rich and comprehensive view of the nature of instructional effectiveness and community cohesion as they relate to the use of an on-site simulation-based practice lab.

Rigor of the Study

As noted earlier, Guba and Lincoln (1981) identified four factors relating to tests of rigor in research: truth value; applicability; consistency; and neutrality (cited in Sandelowski, 1986, p. 29). In looking at the different strategies employed to meet these criteria, this study was able to achieve the conditions of credibility, fitness, auditability, and confirmability in the qualitative and quantitative analyses in the following ways:

Internal validity versus credibility. A research design achieves internal validity when there is confidence that the findings are attributable to the variables being studied, not the procedure itself (Sandelowski, 1986). For example, history and testing are threats to internal validity in quantitative studies. To promote internal validity, each scenario in this study used a design template, such as the Labour and Delivery Template (Appendix M), to maintain consistency and avoid different outcomes that may be attributed to change. In addition, the validity of the knowledge quiz in this study was confirmed by content experts.

Credibility is present in a qualitative study when the descriptions of the experience are faithful to the human experience and recognizable by the subjects, other researchers or readers (Sandelowski, 1986). For example, this study included the use of field notes, research memos, tape recordings, and accurate transcription of the interviews to ensure full and accurate data upon which the researcher could interpret the meaning and build rich descriptions that others could recognize.

External validity versus fittingness. External validity of quantitative research relates to the confidence that "selection biases, effects of pretesting subjects, effects of being in a study, and multitreatment effects have not produced conditions that are incomparable to conditions in the natural world" (Sandelowski, 1986, p. 31). For example, the lack of random selection of participants in this study limits the generalizability of the study results. In contrast, in qualitative research all subjects who belong to a group are appropriate and the researcher must establish "observed events, behaviors, or responses in the lives of the subjects" (Sandelowski, 1986, p.32). Findings are thought to have fittingness if the researcher's interpretation or conclusions are considered to fit the data (Norwood, 2010).

The qualitative findings in this study were well-grounded the experience. The use of a co-coder helped to reflect the elements of the simulation-based practice lab experiences from the sample. Collaborative coding led to corroborative evidence and strengthened the findings.

Reliability versus auditability. Reliability is the degree of consistency between two or more administrations of an instrument. For example, this research study showed a significant difference between the pre- and post-knowledge quiz taken two-weeks apart.

A period of 2 weeks to 4 weeks is recommended between two testing times for paper-and-pencil tests (Burns & Grove, 2009). In addition to the effect of the simulation-based practice lab, this increase in scores may also have been due to the effects of student maturation and remembering first time test responses. The researcher could have put strategies in place to minimize these potential sources of error and achieve test-retest reliability.

In comparison, auditability emphasizes the uniqueness of the experience and requires the researcher to present a clear decision trail that another researcher could identify and follow, as well as arrive at the same or comparable conclusion (Sandelowski, 1986). For example, this study used collaborative coding, frequent meetings, field notes (containing perceptions and thoughts), and research memos to capture the unique meaning of the experience. A decision trail describing the rules used by the researcher and co-coder for categorizing and identifying themes in the data (Norwood, 2010) was presented in the study. Furthermore, the researcher's field notes, memos, personal notes from the thematic analysis, and interview transcripts (anonymity maintained) can be made available for auditing by another researcher/ to confirm findings (Norwood, 2010).

Objectivity versus confirmability. In quantitative research, objectivity is established when researcher detachment from the subjects and the data is maintained. For example, the researcher never taught the students in this study and distanced herself when the students completed the quiz and surveys. In contrast, qualitative research values engagement with the subjects. For example, the researcher conducted interviews, immersed herself in the data analysis, and incorporated a co-coder to help corroborate the findings.

Summary

This chapter presented the findings of both the quantitative and qualitative analysis. The quantitative analysis used descriptive and inferential statistical procedures to compare pre- and post-laboratory values for knowledge and classroom community. Significant improvement in both knowledge and classroom community were identified. Descriptive analysis was conducted of ratings of simulation design and educational practices, as well as learner satisfaction and self-confidence. Students confirmed the presence and importance of specific design elements and educational practices. In addition, students seemed to be satisfied with their learning and their ability to care for the patients in the obstetrical scenarios presented in the simulation activity.

The qualitative analysis of interviews with students, facilitators, and clinical placement instructors in the qualitative phase of the study revealed specific themes and subthemes for each group. The students reported on the simulation-based practice lab and the benefits it had for distance learners and the nurse-patient relationship. They were able to identify how the simulation lab affected their practice in a positive, supportive way. Students also discussed the influence the lab experience had in the development of a strong sense of community. Facilitators reported on the importance of the simulation experience and their roles, as well as their satisfaction with the simulation technology. Clinical placement instructors identified the impact the simulation lab experience had on their students' practice. They related students' satisfaction with positive experiences and developing sense of community.

The next chapter discusses the significance of these findings and provides recommendations for further research.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Distance education provides a means for nursing programs to meet the challenges of a changing health care system and continued nursing shortages. Many distance nursing programs, including the program featured in this study, use a blended format in which the theoretical component of courses is offered online and/or by video conferencing or other computer-mediated technology, while the practice labs and clinical placements are done on-site at a learning centre or local healthcare facility. This integrated delivery model allows students to live and learn in their home communities and increases the likelihood that they will remain and work there after graduation.

As students often find the transition from theory to practice challenging, distance nurse educators continually strive to provide effective teaching methods to prepare students for clinical practice. One of the newest and most promising strategies in nursing education today is the use of computerized human patient simulators and simulations based on clinical scenarios. However, to date, there has been little research on teaching strategies to prepare distance nursing students for clinical practice, and even fewer studies on the use of simulators and simulation-based practice labs. The results of this study add to the body of research in both areas, and provide a deeper understanding of the instructional effectiveness of simulation-based practice labs for preparing students for clinical placements.

In addition, distance nursing programs share common values about the importance of establishing a learning community where students feel a sense of cohesion

or connection with other learners. This research study provides a better understanding of how students' participation in an on-site simulation-based practice lab and the use of collaborative learning activities can promote their sense of belonging to a learning community. The results of this study provide support for the use of simulation-based practice labs to promote cohesion and foster collaborative learning within a community of learners.

Conclusions

The findings of this study support the use of simulation-based practice labs based on the Nursing Education Simulation Framework (Jeffries, 2007). The study found that a well-designed simulation-based practice lab is an effective instructional method for developing clinical nursing skills and knowledge and increasing students' preparedness for clinical placements. These results are similar to those of other studies that also found positive student outcomes resulting from simulation-based clinical practice experiences (Childs & Sepples, 2006; Reese et al., 2010; Smith, 2008; Smith & Roehrs, 2009).

Distance nurse educators should take note of these findings and design simulation-based practice labs to ensure that

(a) simulation activities and scenarios are as closely related as possible to real clinical events,

(b) debriefing sessions, which follow the situation experience, are given adequate time to discuss students' portrayals of all the roles thoroughly,

(c) the learning environment is interactive and allows nursing students to make the connections from theory to practice, and

(d) small groups and assigned roles are incorporated into activities to enhance students' ability to work together (Jeffries & Rogers, 2007).

The study found that the development of skills and knowledge resulting from the learners' participation in the simulation-based practice lab activities was also associated with increased confidence in their ability to care for patients as well as with greater satisfaction in the practice lab itself. These results are similar to other studies that have reported positive satisfaction and self-confidence ratings with clinical simulation experiences (Jeffries & Rizzolo, 2006; Reese et al., 2010; Smith & Roehrs, 2009).

Finally, participation in the simulation-based practice lab was associated with students' greater sense of belonging and connection within a community of learners, as indicated by a significant increase in CCS scores. These results are similar to those of several studies of community cohesion in online courses (Rovai, 2002b; Thurston, 2005; Dawson, 2006; Moisey et al.,2008), including the study by Rovai and Jordan (2004), which examined the sense of community in blended, traditional, and fully online learning environments. While that study did not include simulation, the results showed that the blended learning environment had the highest connectedness and learning subscale scores, and a stronger sense of community among students than either the traditional or the fully online course.

The results of the qualitative and quantitative analyses of this study complemented each other and added a rich, descriptive understanding of how a simulation-based practice lab can promote instructional effectiveness and community cohesion. Triangulation of the quantitative and qualitative findings revealed similarities

between the results, provided answers to the research questions, and yielded the conclusions summarized below.

Instructional Effectiveness

1. Simulation-based practice labs should have the following components of best practices in education identified in the Nursing Education Simulation Framework (Jeffries, 2007): (a) promote active learning, (b) include diverse ways of learning, (c) have high expectations of learner performance, and (d) include collaborative activities and foster collaborative learning.
2. The design of a simulation-based practice lab requires attention to the following design components identified in the Nursing Education Simulation Framework (Jeffries, 2007) in order be instructionally effective: (a) objectives/information, (b) student support, (c) appropriate level of problem solving/complexity, (d) fidelity, and (e) guided reflection/debriefing.
3. Instructional effectiveness is dependent on the fidelity and relevance of the scenarios used for the collaborative learning activities in the simulation-based practice lab.

Community Cohesion

1. The scenarios provide the opportunity for the students to work in a small group setting to promote team work and collaborative learning.
2. The simulation-based practice lab should include group-based activities such as role playing and peer feedback where students work together to promote collaboration and community cohesion.

Knowledge and Skill Development

1. Collaboration and diverse ways of learning (e.g., visual, auditory, and kinaesthetic) are the most important factors in providing a quality learning experience for the students.
2. Feedback/ guided reflection (debriefing) and fidelity/ realism are the most important factors contributing to skill development.
3. To maximize skill development during the simulation-based practice lab, students need to be orientated to and comfortable with the simulation technology prior to the practice lab.
4. Students are able to transfer the specific knowledge and skills they gain from the obstetric-related scenarios in the simulation-based practice lab to generic clinical areas (i.e., medical or surgical nursing practice).

Learner Satisfaction

1. Scenarios should include collaborative problem-solving opportunities to promote team-building and enhance learner satisfaction.
2. The teaching materials (i.e., mannequins, equipment, props, environment) used in the simulation are the most important factor contributing to learner satisfaction.

Self-Confidence

1. Providing a safe, realistic simulation-based lab environment provides students with an opportunity to practice their skills and develop a sense of self-efficacy for nursing clinical practice.

2. Accepting personal responsibility for learning what they need to know is the most important factor contributing to students' self-confidence.

Recommendations

Based on the findings of this study, recommendations are made in the two areas presented below.

Practice Lab Improvements

To improve the simulation-based practice lab experience:

1. Allocate more time for activities. Student interviews revealed that there was not always enough time for students to work within their assigned roles in a simulation. Each simulation was scheduled for 30 minutes with a 20-minute debriefing period. The role of nurse, family member, and observer were randomly assigned; each student only had the opportunity to play the role of the nurse in either the obstetrical or post-partum scenarios. While students recognized the benefits of playing the observer or family member role, they would have liked to have more hands-on practice time with the simulators in the scenarios. The size of this study's sample (n = 42) made it difficult to schedule longer times or repeat scenarios giving students an opportunity to be the nurse in each scenario. Designing the simulation lab experience to allow for increased time for each student to play all three roles would provide this opportunity for more hands-on practice.
2. Schedule additional simulation-based lab experiences. Student interviews also revealed that students wanted to have more clinical simulation experiences.

Students commented on the realistic, hands-on environment where they felt comfortable and able to learn from each other. Some students had identified initial anxiety about coming to the main campus and performing in front of other teachers or students. As they felt comfortable with the expectations and the support they received, they identified positive feelings about the simulation experience and wanted to repeat it. Providing an additional simulation-based practice lab experience in the second year would address their requests.

3. Ensure sufficient knowledge preparation. Student surveys revealed that students needed more preparatory information prior to the simulation-based practice lab. The learning management system, Blackboard Learn™, could be used for posting preparation material and theory presentations that students could access at any time before or during the simulation-based practice lab experience.

Recommendations for Further Research

Based on the findings of this study, the following are recommendations for additional research that would build on the design and implementation of the simulation-based practice lab experience:

1. Assess critical thinking skills. This study only addressed four outcomes identified by the Nursing Education Simulation Framework: knowledge, skill development, learner satisfaction, and self-confidence. One other outcome is described by this model – critical thinking. While critical thinking was subsumed under problem-solving in this study, further research is recommended on the use of human patient simulators for the development of

critical thinking. Critical thinking, as well as knowledge and skill development, learner satisfaction, and self-confidence, are important outcomes for students as they continue in the program and prepare to work in the health care field.

2. Evaluate skill performance. While the qualitative analysis provided insight into the development of skills in the simulation-based practice lab, further research using more objective measures of skill performance (e.g., checklists) to study the development of skill competencies would provide further insight into the instructional effectiveness of the simulation-based practice lab.
3. Explore simulation lab activities in other disciplines. The results of this study are significant for directing the activities of distance nurse educators in the preparation of nursing students for clinical practice. Further research should address the use of similar simulation-based practice activities and scenarios for other health sciences and community service programs delivered by distance education, such as Paramedic, Personal Support Worker, Police Foundations, or Social Service Worker.
4. Examine ways to develop learning community environments. As mentioned earlier, the Nursing Education Simulation Framework (Jeffries, 2007) and Rovai's (2002b) Classroom Community construct provided the conceptual bases for this study. The point of connection between the two frameworks is the learning community which fosters collaborative learning and promotes the development of competent graduates. This is an important and unique finding that adds to the body of knowledge in both nursing and

distance education. Further research should investigate the use of distance technologies (e.g., video conferencing, web-cameras, computer conferencing) to create real-time practice labs that connect students who cannot travel to an on-site simulation-based practice lab. For example, a distance student sitting in a remote classroom could connect to a practice lab using video technology and interact with classmates in group activities as they assume the role of observer or family member. In Second Life (an online 3D virtual world), students could learn collaboratively with other students as they engage in a clinical scenario and provide feedback to their peers in a virtual debriefing room.

Concluding Thoughts

The significance of this study has been addressed at various points within this dissertation, and a final review of this significance is provided below.

The results of this study will provide practical benefits for distance nurse educators. Understanding how well designed simulation experiences can have positive outcomes on students' knowledge, skill development, satisfaction, and self-confidence can encourage distance nurse educators to include simulation in the design of practice labs to ensure better preparation for clinical practice. In addition, understanding the relationship between students' sense of belonging to a learning community and their participation in the collaborative group activities involved in the simulation-based practice lab can support the incorporation of simulation and simulation practice into distance or blended nursing programs.

In conclusion, this study has contributed to the scholarly research and literature in the fields of nursing and distance education research. Further research will continue to investigate the instructional effectiveness and community cohesion that a simulation-based practice lab promotes in a blended distance nursing program.

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Appendix A

Demographic Questionnaire

Identifying Code: _____

Demographic Questionnaire

Please answer the following questions about yourself:

1. Gender: Male: _____ Female: _____
2. Age: _____
3. Number of times you have taken part in a lab experience using a Human Patient Simulator prior to today: _____ times

Note: A human patient simulator is a life-sized adult or child mannequin with a highly developed computer interface that allows healthcare providers an opportunity to experience patient scenarios in many pathologies and respond realistically to a variety of treatments (Bremner, Aduddell, Bennett, & Vangeest, 2006).

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Appendix B

Multiple Choice Knowledge Quiz – (Pre- & Post-Tests)

Nursing Practice II – Lab Theory and Practice
Maternal Newborn: Nursing Care During Labour and Birth,
Post-Caesarean Section, and Newborn Assessment.

MULTIPLE CHOICE

1. The nurse measures the frequency of a labouring woman's contractions by noting:
   a. How long the patient states the contractions last
   b. The time between the end of one contraction and the beginning of the next
   c. The time between the beginning and the end of one contraction
   d. The time between the beginning of one contraction and the beginning of the next

2. The relaxation phase between contractions is important because:
   a. The labouring woman needs to rest
   b. The uterine muscles fatigue without relaxation
   c. The contractions can interfere with fetal oxygenation
   d. The infant progresses toward delivery at these times

3. Vaginal examination reveals the presenting part is the infant's head, which is well flexed on his/her chest. This presentation is referred to as:
   a. Vertex
   b. Military
   c. Brow
   d. Face

4. When the infant is in a vertex presentation, meconium-stained amniotic fluid indicates:
   a. Fetal distress
   b. Fetal maturity
   c. Intact gastrointestinal tract
   d. Dehydration in the mother

5. It is determined that the presenting part of the fetus is the buttocks. At delivery the fetus's hips are flexed and the knees are extended. The nurse would record this presentation as:
   a. Complete breech
   b. Frank breech
   c. Double footling
   d. Buttocks presentation

6. The nurse, while caring for a woman in the first stage of labour, reminds the patient that contractions during this stage of labour:
   a. Get the baby positioned for delivery
   b. Push the baby into the vagina
   c. Dilate and efface the cervix
   d. Get the mother prepared for true labour

7. A woman is 7 cm dilated and her contractions are 3 minutes apart. When she begins cursing at her birthing coach and the nurse, the nurse assesses the most likely explanation for the woman's change in behaviour is that:
   a. Labour has progressed to the transition phase
   b. She lacked adequate preparation for the labour experience
   c. The woman would benefit from a different form of analgesia
   d. The contractions have increased from mild to moderate intensity

8. The nurse explains that the function of contractions during the second stage of labour is to:
   a. Align the baby into the proper position for delivery
   b. Dilate and efface the cervix
   c. Push the baby out of the mother's body
   d. Separate the placenta from the uterine wall

9. The nurse explains that the third stage of labour ends with:
   a. Full cervical dilation
   b. Expulsion of the placenta and membranes
   c. Birth of the baby
   d. Engagement of the head

10. During the fourth stage of labour, the nurse encourages the mother to void, because a full bladder may:
   a. Interfere with cervical dilation
   b. Obstruct progress of the infant through the birth canal
   c. Obstruct the passage of the placenta
   d. Predispose the mother to uterine hemorrhage

11. When the nurse observes the patient bearing down with contractions and crying out, "The baby is coming!" the nurse should:
   a. Go and find the physician
   b. Stay with the woman and use the call bell to get help
   c. Send the woman's partner to locate a registered nurse
   d. Assist with deep breathing to slow the labour process

12. The nurse would coach the labouring woman with a fully dilated cervix to push by saying:
a. "At the beginning of a contraction, hold your breath and push for 10 seconds."
b. "Take a deep breath and push between contractions."
c. "Begin pushing when a contraction starts and continue for the duration of the contraction."
d. "At the beginning of a contraction, take two deep breaths and push with the second exhalation."

13. The most important nursing activity during the fourth stage of labour is to:
a. Monitor the frequency and intensity of contractions
b. Provide comfort measures
c. Assess for haemorrhage
d. Promote bonding

14. One hour post delivery the nurse notes the new mother has saturated three perineal pads. The nurse should:
a. Check the fundus for position and firmness
b. Report to the doctor immediately
c. Change the pads and chart the time
d. Time how long it takes to soak one pad

15. The husband of a woman in labour asks, "What does it mean when the baby is at -1 station?" After giving an explanation, the nurse determines that teaching was effective when the husband states the fetal head is:
a. Above the ischial spines
b. Below the ischial spines
c. Engaged in the mother's pelvis
d. Visible at the perineum

16. The nurse formulates a nursing diagnosis for a woman in the fourth stage of labour. The most appropriate nursing diagnosis is:
a. Pain related to increasing frequency and intensity of contractions
b. Fear related to the probable need for Caesarean delivery
c. Dysuria related to prolonged labour and decreased intake
d. Risk for injury related to haemorrhage

17. At 1 and 5 minutes of life, a newborn's Apgar score is 9. The nurse understands that a score of 9 indicates this newborn:
a. Will require resuscitation
b. May have physical disabilities
c. Will have above average intelligence
d. Is in stable condition

18. The best way to maintain the newborn's temperature immediately after birth is the following:
a. Dry the infant thoroughly, including the hair.
b. Give the infant a bath using warm water.
c. Feed 1 to 2 ounces of warm formula.
d. Limit the length of time parents hold the infant.

19. A student nurse questions the instructor as to what alteration should be made for the assessment of the fundus of a new postoperative Caesarean section patient. The best response is that the fundus of a patient with a Caesarean section is:
a. Not assessed until the second postoperative day
b. Gently assessed as usual
c. Assessed only if large clots appear in lochia
d. Only once every shift

20. Which of these assessments is an expected finding 24 hours after birth?
a. Scant amount of lochia alba on the perineal pad
b. Fundus firm and midline of the abdomen
c. Breasts distended and hard with flat nipples
d. Slight separation of a perineal laceration

Appendix C

Request for Permission to Use NLN/Laerdal Simulation Instruments

From: Alyss Doyle [mailto:adoyle@nln.org]
Sent: Friday, January 08, 2010 4:08 PM
To: walker (Debra Walker)
Subject: RE: Request to Use NLN Research Instruments

Congratulations! You have been granted permission to use the NLN/ Laerdal Simulation Instruments. Attached to this email are your approval letter and the instruments themselves. Good luck!

Alyss Doyle | Coordinator of Educational Programming | National League for Nursing | www.nln.org
adoyle@nln.org | Phone: 800-669-1656 x145 | Fax: 212-812-0391 | 61 Broadway | New York, NY 10006

National League for Nursing The Voice for Nursing Education

NLN
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January 08, 2010

Debra Walker
Confederation College
1450 Nakina Dr., PO Box 398
Thunder Bay, ON P7C 4W1

It is my pleasure to grant you permission to use the "Educational Practices Questionnaire," "Simulation Design Scale" and "Student Satisfaction and Self-Confidence in Learning" NLN/Laerdal Research Tools. In granting permission to use the instruments, it is understood that the following assumptions operate and "caveats" will be respected:

1. It is the sole responsibility of (you) the researcher to determine whether the NLN questionnaire is appropriate to her or his particular study.
2. Modifications to a survey may affect the reliability and/or validity of results. Any modifications made to a survey are the sole responsibility of the researcher.
3. When published or printed, any research findings produced using an NLN survey must be properly cited as specified in the Instrument Request Form. If the content of the NLN survey was modified in any way, this must also be clearly indicated in the text, footnotes and endnotes of all materials where findings are published or printed.

I am pleased that material developed by the National League for Nursing is seen as valuable as you evaluate ways to enhance learning, and I am pleased that we are able to grant permission for use of the "Educational Practices Questionnaire," "Simulation Design Scale" and "Student Satisfaction and Self-Confidence in Learning" instruments.

M. Elaine Tagliareni

Elaine Tagliareni EdD, RN, CNE, FAAN
Chief Program Officer
National League for Nursing

Appendix D

Simulation Design Scale (SDS)

Simulation Design Scale (Student Version)

In order to measure if the best simulation design elements were implemented in your simulation , please complete the survey below as you perceive it. There are no right or wrong answers, only your perceived amount of agreement or disagreement. Please use the following code to answer the questions.

Use the following rating system when assessing the simulation design elements:

1 - Strongly Disagree with the statement
2 - Disagree with the statement
3 - Undecided - you neither agree or disagree with the statement
4 - Agree with the statement
5 - Strongly Agree with the statement
NA - Not Applicable; the statement does not pertain to the simulation activity performed.

Rate each item based upon how important that item is **to you.**

1 - Not Important
2 - Somewhat Important
3 - Neutral
4 - Important
5 - Very Important

Item	1	2	3	4	5	NA	1	2	3	4	5
Objectives and Information											
1. There was enough information provided at the begining of the simulation to provide direction and encouragement.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
2. I clearly understood the purpose and objectives of the simulation.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
3. The simulation provided enough information in a clear matter for me to problem-solve the situation.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
4. There was enough information provided to me during the simulation.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
5. The cues were appropriate and geared to promote my understanding.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
Support											
6. Support was offered in a timely manner.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
7. My need for help was recognized.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
8. I felt supported by the teacher's assistance during the simulation.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
9. I was supported in the learning process.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5

Revised December 22, 2004

Simulation Design Scale (Student Version)

Use the following rating system when assessing the simulation design elements:

1 - Strongly Disagree with the statement
2 - Disagree with the statement
3 - Undecided - you neither agree or disagree with the statement
4 - Agree with the statement
5 - Strongly Agree with the statement
NA - Not Applicable; the statement does not pertain to the simulation activity performed.

Rate each item based upon how important that item is **to you.**

1 - Not Important
2 - Somewhat Important
3 - Neutral
4 - Important
5 - Very Important

Item	1	2	3	4	5	NA	1	2	3	4	5
Problem Solving											
10. Independent problem-solving was facilitated.	○ 1	○ 2	○ 3	○ 4	○ 5	○ NA	○ 1	○ 2	○ 3	○ 4	○ 5
11. I was encouraged to explore all possibilities of the simulation.	○ 1	○ 2	○ 3	○ 4	○ 5	○ NA	○ 1	○ 2	○ 3	○ 4	○ 5
12. The simulation was designed for my specific level of knowledge and skills.	○ 1	○ 2	○ 3	○ 4	○ 5	○ NA	○ 1	○ 2	○ 3	○ 4	○ 5
13. The simulation allowed me the opportunity to prioritize nursing assessments and care.	○ 1	○ 2	○ 3	○ 4	○ 5	○ NA	○ 1	○ 2	○ 3	○ 4	○ 5
14. The simulation provided me an opportunity to goal set for my patient.	○ 1	○ 2	○ 3	○ 4	○ 5	○ NA	○ 1	○ 2	○ 3	○ 4	○ 5
Feedback/Guided Reflection											
15. Feedback provided was constructive.	○ 1	○ 2	○ 3	○ 4	○ 5	○ NA	○ 1	○ 2	○ 3	○ 4	○ 5
16. Feedback was provided in a timely manner.	○ 1	○ 2	○ 3	○ 4	○ 5	○ NA	○ 1	○ 2	○ 3	○ 4	○ 5
17. The simulation allowed me to analyze my own behavior and actions.	○ 1	○ 2	○ 3	○ 4	○ 5	○ NA	○ 1	○ 2	○ 3	○ 4	○ 5
18. There was an opportunity after the simulation to obtain guidance/feedback from the teacher in order to build knowledge to another level.	○ 1	○ 2	○ 3	○ 4	○ 5	○ NA	○ 1	○ 2	○ 3	○ 4	○ 5
Fidelity (Realism)											
19. The scenario resembled a real-life situation.	○ 1	○ 2	○ 3	○ 4	○ 5	○ NA	○ 1	○ 2	○ 3	○ 4	○ 5
20. Real life factors, situations, and variables were built into the simulation scenario.	○ 1	○ 2	○ 3	○ 4	○ 5	○ NA	○ 1	○ 2	○ 3	○ 4	○ 5

Revised December 22, 2004

Appendix E

Educational Practices in Simulation Scale (EPSS)

Educational Practices Questionnaire (Student Version)

In order to measure if the best practices are being used in your simulation, please complete the survey below as you perceive it. There are no right or wrong answers, only your perceived amount of agreement or disagreement. Please use the following code to answer the questions.

Use the following rating system when assessing the educational practices:

1 - Strongly Disagree with the statement
2 - Disagree with the statement
3 - Undecided - you neither agree or disagree with the statement
4 - Agree with the statement
5 - Strongly Agree with the statement
NA - Not Applicable; the statement does not pertain to the simulation activity performed.

Rate each item based upon how important that item is **to you.**

1 - Not Important
2 - Somewhat Important
3 - Neutral
4 - Important
5 - Very Important

Item	1	2	3	4	5	NA	1	2	3	4	5
Active learning											
1. I had the opportunity during the simulation activity to discuss the ideas and concepts taught in the course with the teacher and other students.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
2. I actively participated in the debriefing session after the simulation.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
3. I had the opportunity to put more thought into my comments during the debriefing session.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
4. There were enough opportunities in the simulation to find out if I clearly understand the material.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
5. I learned from the comments made by the teacher before, during, or after the simulation.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
6. I received cues during the simulation in a timely manner.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
7. I had the chance to discuss the simulation objectives with my teacher.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
8. I had the opportunity to discuss ideas and concepts taught in the simulation with my instructor.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
9. The instructor was able to respond to the individual needs of learners during the simulation.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
10. Using simulation activities made my learning time more productive.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5

Revised December 22, 2004

Educational Practices Questionnaire (Student Version)

Use the following rating system when assessing the educational practices:
- 1 - Strongly Disagree with the statement
- 2 - Disagree with the statement
- 3 - Undecided - you neither agree or disagree with the statement
- 4 - Agree with the statement
- 5 - Strongly Agree with the statement
- NA - Not Applicable; the statement does not pertain to the simulation activity performed.

Rate each item based upon how important that item is **to you.**
- 1 - Not Important
- 2 - Somewhat Important
- 3 - Neutral
- 4 - Important
- 5 - Very Important

Item	1	2	3	4	5	NA	1	2	3	4	5
Collaboration											
11. I had the chance to work with my peers during the simulation.	○ 1	○ 2	○ 3	○ 4	○ 5	○ NA	○ 1	○ 2	○ 3	○ 4	○ 5
12. During the simulation, my peers and I had to work on the clinical situation together.	○ 1	○ 2	○ 3	○ 4	○ 5	○ NA	○ 1	○ 2	○ 3	○ 4	○ 5
Diverse Ways of Learning :											
13. The simulation offered a variety of ways in which to learn the material.	○ 1	○ 2	○ 3	○ 4	○ 5	○ NA	○ 1	○ 2	○ 3	○ 4	○ 5
14. This simulation offered a variety ways of assessing my learning.	○ 1	○ 2	○ 3	○ 4	○ 5	○ NA	○ 1	○ 2	○ 3	○ 4	○ 5
High Expectations											
15. The objectives for the simulation experience were clear and easy to understand.	○ 1	○ 2	○ 3	○ 4	○ 5	○ NA	○ 1	○ 2	○ 3	○ 4	○ 5
16. My instructor communicated the goals and expectations to accomplish during the simulation.	○ 1	○ 2	○ 3	○ 4	○ 5	○ NA	○ 1	○ 2	○ 3	○ 4	○ 5

Revised December 22, 2004

Appendix F

Learner Satisfaction and Self-Confidence in Learning Scale

Learner Satisfaction and Self- Confidence in Learning

Instructions: This questionnaire is a series of statements about your personal attitudes about the instruction you receive during your simulation activity. Each item represents a statement about your attitude toward your satisfaction with learning and self-confidence in obtaining the instruction you need. There are no right or wrong answers. You will probably agree with some of the statements and disagree with others. Please indicate your own personal feelings about each statement below by marking the numbers that best describe your attitude or beliefs. Please be truthful and describe your attitude as it really is, not what you would like for it to be. This is anonymous with the results being compiled as a group, not individually.

Mark:
1 = STRONGLY DISAGREE with the statement
2 = DISAGREE with the statement
3 = UNDECIDED - you neither agree or disagree with the statement
4 = AGREE with the statement
5 = STRONGLY AGREE with the statement

Satisfaction with Current Learning	**SD**	**D**	**UN**	**A**	**SA**
1. The teaching methods used in this simulation were helpful and effective.	O 1	O 2	O 3	O 4	O 5
2. The simulation provided me with a variety of learning materials and activities to promote my learning the medical surgical curriculum.	O 1	O 2	O 3	O 4	O 5
3. I enjoyed how my instructor taught the simulation.	O 1	O 2	O 3	O 4	O 5
4. The teaching materials used in this simulation were motivating and helped me to learn.	O 1	O 2	O 3	O 4	O 5
5. The way my instructor(s) taught the simulation was suitable to the way I learn.	O 1	O 2	O 3	O 4	O 5
Self-confidence in Learning	**SD**	**D**	**UN**	**A**	**SA**
6. I am confident that I am mastering the content of the simulation activity that my instructors presented to me.	O 1	O 2	O 3	O 4	O 5
7. I am confident that this simulation covered critical content necessary for the mastery of medical surgical curriculum.	O 1	O 2	O 3	O 4	O 5
8. I am confident that I am developing the skills and obtaining the required knowledge from this simulation to perform necessary tasks in a clinical	O 1	O 2	O 3	O 4	O 5
9. My instructors used helpful resources to teach the simulation.	O 1	O 2	O 3	O 4	O 5
10. It is my responsibility as the student to learn what I need to know from this simulation activity.	O 1	O 2	O 3	O 4	O 5
11. I know how to get help when I do not understand the concepts covered in the simulation.	O 1	O 2	O 3	O 4	O 5
12. I know how to use simulation activities to learn critical aspects of these skills.	O 1	O 2	O 3	O 4	O 5
13. It is the instructor's responsibility to tell me what I need to learn of the simulation activity content during class time..	O 1	O 2	O 3	O 4	O 5

Revised December 22, 2004

Appendix G

Classroom Community Scale (CCS)

Identifying Code: _____

Classroom Community Scale (CCS)

DIRECTIONS: Below, you will see a series of statements concerning a specific course you are presently taking or lab you have recently completed. Read each statement carefully and select the statement that comes closest to indicate how you feel about the course. There are no correct or incorrect responses. If you neither agree nor disagree with a statement or are uncertain, select the neutral (N) area. Do not spend too much time on any one statement, but give the response that seems to describe how you feel.

Please respond to all items.

(SA) = Strongly Agree, (A) = Agree, (N) = Neutral

(D) = Disagree, (SD) = Strongly Disagree

1. I feel that students in this course care about each other..... (SA) (A) (N) (D) (SD)
2. I feel that I am encouraged to ask questions..... (SA) (A) (N) (D) (SD)
3. I feel connected to others in this course..... (SA) (A) (N) (D) (SD)
4. I feel that it is hard to get help when I have a question ..... (SA) (A) (N) (D) (SD)
5. I do not feel a spirit of community..... (SA) (A) (N) (D) (SD)
6. I feel that I receive timely feedback..... (SA) (A) (N) (D) (SD)
7. I feel that this course is like a family..... (SA) (A) (N) (D) (SD)
8. I feel uneasy exposing gaps in my understanding ..... (SA) (A) (N) (D) (SD)
9. I feel isolated in this course ..... (SA) (A) (N) (D) (SD)
10. I feel reluctant to speak openly ..... (SA) (A) (N) (D) (SD)
11. I trust others in this course..... (SA) (A) (N) (D) (SD)
12. I feel that this course results in only modest learning..... (SA) (A) (N) (D) (SD)
13. I feel that I can rely on others in this course..... (SA) (A) (N) (D) (SD)
14. I feel that other students do not help me learn..... (SA) (A) (N) (D) (SD)
15. I feel that members of this course depend on me..... (SA) (A) (N) (D) (SD)
16. I feel that I am given ample opportunities to learn..... (SA) (A) (N) (D) (SD)
17. I feel uncertain about others in this course ..... (SA) (A) (N) (D) (SD)
18. I feel that my educational needs are not being met..... (SA) (A) (N) (D) (SD)
19. I feel confident that others will support me ..... (SA) (A) (N) (D) (SD)
20. I feel that this course does not promote a desire to learn..... (SA) (A) (N) (D) (SD)

Appendix H

Request for Permission to Use Classroom Community Scale (CCS)

From: Alfred Rovai [mailto:alfrrov@regent.edu]
Sent: December 4, 2009 5:57 AM
To: Debra Walker
Subject: RE: Request for permission to use to your Classroom Community Scale

Good morning, Debra.

You may use the instrument as you requested. Attached is an Adobe Acrobat file you may find helpful.

Best wishes,
Fred

Alfred P. Rovai, Ph.D.
Associate Vice President, Academic Affairs, Regent University 1000 Regent University Drive, Virginia Beach, VA 23464-9800
757.352.4861

From: Debra Walker [dawalker@shaw.ca]
Sent: Thursday, December 03, 2009 11:08 PM
To: Alfred Rovai
Subject: Request for permission to use to your Classroom Community Scale

Dr. Rovai,

To introduce myself, I am a second year doctoral student in Athabasca University's Doctor of Education in Distance Education program.

I am doing research with nursing students that will look at Optimizing Instructional Effectiveness and Community Cohesion in a Blended Nursing Distance program.

I am sending this email to ask your permission to use your Classroom Community Scale in my research project. Your survey will be used for the purpose outlined in this email only. The only modification that I will make to the items will be to change the word 'course' to 'simulation' with the exception of item #18 in which it will be changed to 'lab, group' to avoid confusion for the students completing it. The report of my research will note this, as well as acknowledging that permission was granted to use your survey.

I thank you in advance for your consideration, and I look forward to hearing from you.

Sincerely,
Debra Walker, RN. BA, MDE
Athabasca University
Athabasca, AB
Canada

Appendix I

Poster Notification for Maternal-Infant Simulation-Based Practice Lab

CONFEDERATION COLLEGE

Education That Works

Maternal Newborn Lab
for Regional Practical Nursing Students

Section 1 – Friday - 1300 to 1800
Section 2 - Saturday- 0800 to 1300

Friday1830 to 2000
Social Thunder Bay Campus – all students

This lab reviews three content areas: delivery, newborn, and post-partum assessment.

It will provide students with:

- **Hands on practice with patient simulators**
- **Opportunity to apply knowledge and skills in a safe, interactive simulation environment**.

Facilitators:

Barb Morrison RN, HBScN, MEd
Lynne Thibeault, RN (EC), HBScN, MEd, ENC(C)
Caroline Hutch, RN, MScN

Questions – Contact: Debra Walker RN, BA, MDE, Doctoral student
807-473-4992

Appendix J

Student, Facilitator, and Clinical Placement Teacher Letters of Invitation

AthabascaUniversity

Centre for Distance Education

Dear Student,

This letter is to invite you to participate in a research study investigating the instructional effectiveness and community cohesion associated with the onsite delivery of a simulation-based practice lab in a blended Practical Nursing program at Confederation College.
The purpose of this research, which is being undertaken as part of my doctoral studies at Athabasca University, is to:

1. Determine what effect, if any, participation in a simulation-based practice lab has on instructional effectiveness (Jeffries, 2007): knowledge, skills, learner satisfaction, and self-confidence.
2. Determine what effect, if any, participation in a simulation-based practice lab has on sense of connectedness as measured by Rovai's (2002) Classroom Community Scale.

I am seeking your participation in this study because you will be participating in a scheduled simulation-based practice lab in Thunder Bay. If you agree to participate, I will ask you to sign an "Information and Consent to Participate" form before taking part in your practice lab.

If you are interested in volunteering for this study, you would be expected to:

1. Respond to this invitation by email (see below).
2. If you agree to take part in this research study, you will be asked to spend about 30 minutes to fill out a short demographic questionnaire and to complete two pre-test/post-test quizzes, plus another 45 minutes after the simulation lab to complete three post lab paper surveys (75 minutes, total).
3. Participate in a 15-20 minute semi-structured telephone interview with the researcher to be held during the month of April or May after the simulation-based practice lab has taken place.

Please be assured that your involvement in this research is completely voluntary and there are no known or anticipated risks to participation in this study. You have the right to refuse to participate and to withdraw at any time during this research, without prejudice. Your participation or your choice to withdraw will in no way affect your standing, or grades, in PN226 Nursing Practice II-Lab Theory & Practice or in the Practical Nursing program. You may also refuse to answer any question posed to you during this study.

All information collected from you will be stored in a secure location that can be accessed by the researcher only and *all information will be held confidential.* The data collected will be coded so that no identifying information remains, and it will be retained permanently for future research use. On completion of analysis, a summary of the results of this research will be made available to all interested participants on request to Debra Walker. The existence of the research will be

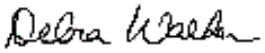
listed as an abstract, available online through the Athabasca University Digital Thesis and Project Room (DTPR), and the final research paper will be publicly available.

If you have any questions about this study please feel free to contact me at 1-807-473-4992 or via email at dawalker@shaw.ca, or you may contact my researcher supervisor, Dr. Susan Moisey at 1-866-403-7426.

This study has been reviewed by the Athabasca University Research Ethics Board and Confederation College Research Ethics Team. If you have any comments or concerns regarding your treatment as a participant in this study, please feel free to contact the Athabasca University Research Ethics Board at 1-800-788-9041 or via email rebsec@athabascau.ca, or Confederation College Research Ethics Team at 1-807-473-3781 or via email at jbarton@confederationc.on.ca .

Thank you in advance for your interest in this project.

Yours sincerely,



Debra Walker, RN, BA, MDE, Doctoral student
Doctor of Education in Distance Education Program,
Centre for Distance Education
Athabasca University
1 University Drive
Athabasca, AB T9S 3A3

Phone: 1-807-473-4992
Email: dawalker@shaw.ca

To participate in this research,
please e-mail Debra Walker at dawalker@shaw.ca .

Please include EITHER one or the other of the following statements in the body of your email:

- I _____ (first and last name) agree to participate in the pre- and post-lab parts of the study, including the demographic questionnaire, pre-test/post-test quizzes, and post-lab paper surveys.

OR

- I _____ (first and last name) agree to participate in the pre-and post-lab parts of the study, including the demographic questionnaire, pre-test/post-test quizzes, and post-lab paper surveys, **and** I would like to be contacted to take part in an interview after the lab. My contact information for the interview is:

  Preferred e-mail address _____.
  Telephone number where I can be reached between the hours of _____ and _____ on _____ (day of the week) is _____.

  Your e-mail will serve as your consent to participate in the interview.
  Volunteers will be notified by e-mail with a time and date for the interview.

AthabascaUniversity

Centre for Distance Education

Dear Colleague,

This letter is to invite you to participate in a research study investigating the instructional effectiveness and community cohesion associated with the onsite delivery of a simulation-based practice lab in a blended Practical Nursing program at Confederation College.

The purpose of this research, which is being undertaken as part of my doctoral studies at Athabasca University, is to:

1. Determine what effect, if any, participation in a simulation-based practice lab has on instructional effectiveness (Jeffries, 2007): knowledge, skills, learner satisfaction, and self-confidence.
2. Determine what effect, if any, participation in a simulation-based practice lab has on sense of connectedness as measured by Rovai's (2002) Classroom Community Scale.

I am seeking your participation in this study because you have either been a facilitator in the simulation-based practice lab experience or you will be working with the students in clinical after they have completed the simulation-based practice lab experience.

If you are interested in volunteering for this study, you would be expected to:

1. Respond to this invitation by email (see below).
2. Participate in a 15-20 minute semi-structured telephone interview with the researcher, to be held after the simulation-based practice lab has taken place at a time and date at your convenience, or immediately after the lab.

Please be assured that your involvement in this research is completely voluntary and there are no known or anticipated risks to participation in this study. You have the right to refuse to participate and to withdraw at any time during this research, without prejudice. You may also refuse to answer any question posed to you during this study.

All information collected from you will be stored in a secure location that can be accessed by the researcher only and *all information will be held confidential.* The data collected will be coded so that no identifying information remains, and it will be retained permanently for future research use. On completion of analysis, a summary of the results of this research will be made available to all faculty members and I will share any

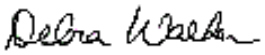
publications resulting from this research on request. The existence of the research will be listed as an abstract, available online through the Athabasca University Digital Thesis and Project Room (DTPR), and the final research paper will be publicly available.

If you have any questions about this study please feel free to contact me at 1-807-473-4992 or via email at dawalker@shaw.ca, or you may contact my researcher supervisor, Dr. Susan Moisey at 1-866-403-7426.

This study has been reviewed by the Athabasca University Research Ethics Board and Confederation College Research Ethics Team. If you have any comments or concerns regarding your treatment as a participant in this study, please feel free to contact the Athabasca University Research Ethics Board at 1-800-788-9041 or via email rebsec@athabascau.ca, or Confederation College Research Ethics Team at 1-807-473-3781 or via email at jbarton@confederationc.on.ca .

Thank you in advance for your interest in this project.

Yours sincerely,



Debra Walker, RN, BA, MDE, Doctoral student
Doctor of Education in Distance Education Program,
Centre for Distance Education
Athabasca University
1 University Drive
Athabasca, AB T9S 3A3

Phone: 1-807-473-4992
Email: dawalker@shaw.ca

To participate in this research,
please e-mail Debra Walker at dawalker@shaw.ca.

Please include the following statement in the body of your email:

> "I _____ (first and last name) agree to participate in a 15-20 minute semi-structured telephone interview with the researcher to be held after the simulation-based practice lab has taken place."

Your e-mail will serve as your consent to participate in the study.
You will be notified by e-mail with a time and date for the interview.

Appendix K

Information and Consent to Participate in a Research Study

Information and Consent to Participate in a Research Study

Title of the Research: Designing Simulation-based Practice Labs: Optimizing Instructional Effectiveness and Community Cohesion in a Blended Nursing Distance Education Program

Contact Information:

Researcher: Debra Walker
1-807-473-4992
Program
dawalker@shaw.ca

Supervisor: Dr. Susan Moisey
Doctor of Education in Distance Education

Athabasca University
1 University Drive
Athabasca, AB T9S 3A3
Canada.
1-866-403-7426

Invitation: As a student enrolled in the first year of the distance Practical Nursing program, you are invited to participate in a research study conducted by an Athabasca University doctoral student.

Description of Research: The purpose of this research study is to create an effective practice lab for Practical Nursing students in a distance education program. As part of your course requirement for PN228 this winter, you will be assigned to groups of three or four to take part in a simulation-based practice lab in Thunder Bay. It will take approximately 5 hours to complete the practice lab, and approximately 90 minutes to attend an evening social event at the college. If you agree to take part in this research study, you will be asked to fill out a short demographic questionnaire, complete two pre-test/post-test quizzes, and three post lab paper surveys. You will also be asked to volunteer to participate in an interview after the simulation-based practice lab has taken place. By participating in this study, you will help provide valuable information about how best to incorporate simulation-based practice labs in our distance nursing program.

Risks and Benefits: Participation in this research study is strictly voluntary. No marks will be assigned or lost if you do not wish to take part in the study; you will still be able to take part in the simulation exercises. Active involvement in the research process makes learning more meaningful.

Right to Refuse: You are being asked to participate in this research project. However, you will be able to withdraw at any time during the period in which data is being collected, without prejudice or academic penalty. You may refuse to answer any questions in the survey, questionnaire or interview setting.

Privacy, Confidentiality and Anonymity: Steps will be taken to respect your privacy in this study. No names will be required on surveys or questionnaires. All data will be stored in a locked cabinet at the researcher's home and will be shredded on completion of the analysis. Only the researcher will have access to the original data from this study. No names will be used in the research report, now or in the future.

"**All information will be held confidential, except when legislation or a professional code of conduct requires that it be reported**."

“I have read and understood the information contained in this letter, and I agree to participate in the study, on the understanding that I may refuse to answer certain questions, and I may withdraw during the data collection period.”

_____ _____

Signature Date

Appendix L

Simulation Schedule

Schedules

1100 to 1600 1200 to 1700	Group #1: 19 students
1600 to 1700 1800 to 2200	Group #2: 12 students
0800 to 1300	Group #3: 11 students

Simulation Schedule		
1 hour	Introduction	
1 hour	30 minutes for scenario 20 minutes for debriefing 10 minutes to rotate and reset stations	Station #1: Station #2: Station #3:
1 hour	30 minutes for scenario 20 minutes for debriefing 10 minutes to rotate and reset stations	Station #1: Station #2: Station #3:
1 hour	30 minutes for scenario 20 minutes for debriefing 10 minutes to rotate and reset stations	Station #1: Station #2: Station #3:
1 hour	Wrap up Complete surveys (pen and pencil)	Room 175

Appendix M

PN Semester 2 Labour and Delivery Template

PN Semester 2 Labour and Delivery Template

Date: **File Name: Labour and delivery**

Discipline: Nursing **Student Level: first year**

Expected Simulation Run Time: 20 min

Guided Reflection Time: 30 min

Location: Sim lab **Location for Reflection: Sim lab**
- **need chairs**

Admission Date: **Today's Date:** **Yesterday** **Brief Description of Client** **Name: Gender: Age: 26** **Race:** **Noelle Blaze** **Weight: ____kg Height: ____cm** **Religion: Major Support:** **Phone:** **Allergies:** **Immunizations:** **Attending Physician/Team:** **Past Medical History:** **History of Present illness:** **40 weeks gestation** **Social History:** **First child** **Primary Medical Diagnosis:** **Surgeries/Procedures & Dates:** **P1**	**Psychomotor Skills Required Prior to Simulation** 1. Coaching of mother and assistance during labour and delivery. 2. Assessment of the mother during labour and delivery and post partum period. 3. Assessment of the newborn. 4. Assisting the mother and newborn with breast feeding. 5. Providing care for the post partum mother and newborn. 6. Body substance precautions. **The following Cognitive Activities should be performed prior to the simulation –** 1. Review the following in the Leifer textbook: **Chapter 6** Nursing care of the mother and infant during labour and birth, **Chapter 7** Nursing management of pain during labour and birth, **Chapter 9** The family after birth, **Chapter 12** The term newborn, **Chapter 21** The child's experience of hospitalization 2. Complete the Critical Thinking questions and Review Questions at the end of each of the above chapters. 3. Review the following in the Jarvis textbook: Interview techniques and therapeutic communication.

Simulation Learning Objectives

1. Apply critical thinking skills when caring for a mother and infant in simulated scenarios.
2. Perform a comprehensive assessment of a mother and newborn during labour and delivery.
3. Provide individualized nursing care during labour and delivery.
4. Implement non- pharmacological methods of pain management during labour and delivery.
5. Provide individualized nursing care to a mother and infant.
6. Demonstrate therapeutic communication and interview skills when caring for a new mother and family.
7. Provide appropriate health teaching for a new mother and family.
8. Evaluate care provided.

Fidelity (choose all that apply to this simulation)

Setting/Environment o **Women's Center** **Simulator Mannequin/s Needed:** **Noelle® model with 2 connectors and baby with placenta intact** **Vita sim Baby – in control room for crying** **Screaming mother tape/recording?** **Props:** **Glass of water Ball** **Bloody fluid** **Mannequin lubricant** Equipment attached to mannequin: **X IV tubing with primary line NS fluids running TKVO** **X ID band Noelle Blaze** Equipment available in room o **Pillows** o **OBS kit** o **Cord clamp - students not to close** o **Solution for cleaning - water in basin** o **Goggles/gowns** o **Gloves various sizes**	**Medications and Fluids** - **Water cup** - **Diagnostics Available** Documentation Forms o **Paper** Recommended Mode for Simulation (i.e., manual, programmed, etc.) **Manual – turn on intercom speaker for Noelle's voice and Vita Sim baby in the control room for the crying**

<table>
<tr>
<td>

Doppler
Blue pads
Bulb Suction
Towels
Face Cloths - one wet one on table
Soaker pads
Baby warmer / towels/ APGAR chart

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<tr>
<td>
Roles / Guidelines for Roles

Primary Nurse
Secondary Nurse
Family Member #1
Observer/s & Staff Nurse

Important Information Related to Roles

Nurse one responsible for pt
Do not clamp on umbilical cord
Help cervix if not progressing

Significant Lab Values

Physician Orders
</td>
<td>
Student Information Needed Prior to Scenario:
X Has been oriented to simulator
X Understands guidelines /expectations for scenario
X Has accomplished all pre-simulation requirements
X All participants understand their assigned roles
X Has been given time frame expectations
X Other – show supplies, show family member the switch for Noelle

Report Students Will Receive Before Simulation from the staff nurse

Time: It is now 0730

You have been assigned to assist in the care of Noelle Blaze, a 26 year old who has been admitted to your unit. She has been in labour for 6 hours, membranes have ruptured and is currently having 45 second contractions, 3 minutes apart. Refusing analgesics. Vitals– 120/72, 95, 24, T 37.2 Sat 97%. Fetal heart rate 145 / min

You need to check that we have everything set up in the room. Stay with Noelle and her family member and check and see how she is progressing including the fetal heart rate. I’ll be back when I get a chance.
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References, Evidence-Based Practice Guidelines, Protocols, or Algorithms Used For This Scenario: (site source, author, year, and page)

Leifer

Labour and Delivery Scenario Summary
You have been assigned to assist in the care of Noelle Blaze, a 26 year old who has been admitted to your unit. She has been in labour for 6 hours; membranes have ruptured and mom is currently having 45 second contractions, 3 minutes apart. Refusing analgesics. Vitals– 120/72, 95, 24, T 37.2 Sat 97%. Fetal heart rate 145 / min

You need to check that we have everything set up in the room. Stay with Noelle and her family member and check and see how she is doing including the fetal heart rate. I'll be back when I get a chance.

Active labour
Pain control
Relaxation techniques – let your arm relax, now let your shoulders relax, now let your neck relax
Effluerage – "What were we supposed to do on her stomach?" "I remember something about stroking it??? – Can you show me how to do it?"
I'm feeling dizzy, is there anything you can do to help? – turn to side / pillows

Fetal HR – check pulse 14- 145…
Sacral pressure – once on side – What was I supposed to do with this ball?
Focal point – focus on that camera during the contractions

Breathing

- Breathing rapidly …. Feeling dizzy, my mouth is numb ".'Is there anything we can do for her dizziness?" – cupped hands, moist washcloth, hold breath before exhaling
- Try slow paced breathing – cleansing breath, slow, cleansing breath
- Try modified breathing – cleansing breath, fast , cleansing breath
- Try modified paced breathing – cleansing breath, slow, fast, slow, cleansing breath
- Need to push = try pant, blow, pant, pant, blow, pant, pant, pant, blow
- Need to push = try pant, pant, pant, blow, pant, pant, pant, blow

"Can you see the head?" Can you see the head?.... we can see the head Noelle,
"The baby is coming" I need to push!
Husband – fingertips on the top of the fundus- hard to indent like a chin – later really hard, like a forehead

Explain regarding cleansing breath before and after– slow paced breathing or modified breathing

Hyperventilating…breathe through face cloth, cupped hands, hold breath before exhaling

Cleanse perineum – top, side, side, down
Notes, fully dilated
Cleansing breath, deep breath and push with open glottis to count of 10
Supports head – suctions when able
Push
Watch shoulder/cervix support head
Help out baby – clamp cord - pass to other nurse
Assist with placenta Check for hemorrhage, fundal massage
Nurse #2 – dry, warm, check APGAR – bring back to mom to nurse - warmth

Labour and Delivery Scenario Progression Outline

Timing (approximate)	**Mannaquin Actions**	**Expected Interventions**	**Husband/ Sister May Use the Following Cues**
0- 3 **Slowest setting on Noelle – on pause** **HR 160** **Right Occiput Anterior position** **Contractions about 30 sec apart**	**" Oh here's another one!" breathing deeply**	**Introduce self – collect baseline info re labour** -	***Turn on Noelle** *Relaxation techniques* – **"You need to relax Noelle….Let your arm relax, now let your shoulders relax, now let your neck relax…"**
	" Oh here's another one!" breathing deeply		**"How are things going? Is it time yet? How much is she dilated?"**
3-5	I'm feeling dizzy, is there anything you can do to help? – **" Oh here's another one!" breathing deeply**	**Help to position on side - pillows** **Fetal HR – check pulse 14- 145…** **Try to count duration and frequency**	*Effluerage* – **"What were we supposed to do on her stomach?" " I remember something about stroking it??? – Can you show me how to do it?"**

			***Keep your hand on the fundal area -*
5 – 10 (increases force at about 8 min)	"This breathing isn't helping!!!!!" "Here's another one" Cleansing breath… rapid modified breathing and cleansing breath	**Explain regarding cleansing breath before and after – slow paced breathing or modified breathing**	**"What's happening is it time yet?" Her stomach felt like a rock during that last contraction**
	"Here's another one" Cleansing breath… very rapid breathing…cleansing breath **I'm getting dizzy again…my lips and face are getting numb**	**Hyperventilating… breathe through face cloth, cupped hands, hold breath before exhaling** **Cleanse perineum – top, side, side, down**	**"I think she's hyperventilating" Can you see the baby's head? Can you see the baby's head??? … ***IF can see the head* …Noelle, we can see her head!**
10- 15	"Here's another one" I need to push!!!!	**Not fully dilated:** Need to push = try pant, blow, pant, pant, blow, pant, pant, pant, blow Need to push = try pant, pant, pant, blow, pant, pant, pant, blow **Notes, fully dilated Cleansing breath , deep breath and push with open glottis to count of 10** **Supports head – suctions when able**	***Pick up the ball on the over bed table*

	I need to PUSH!!!!!!	**Push** **Watch shoulder/cervix** **support head**	
15 – 20 **BABY CRYING** **Baby Content**	**Oh , I did it…** **"Here's another one!"** **I want to see my baby!**	**Help out baby – Suction now or earlier, clamp cord - pass to other nurse** **Assist with placenta** **Check for haemorrhage, fundal massage** **Nurse #2 – dry, warm, check APGAR – bring back to mom to nurse - warmth**	***Stunned –* "**What was I supposed to do with this ball?"**

Debriefing / Guided Reflection Questions for Labour and Delivery Sim

1. How did you feel throughout the simulation experience?

2. What were the key assessments at the beginning of the scenario?
   Contractions length/frequency
   Fetal HR - how often should this be checked during the delivery? If no monitor between contractions
   Mom's status - pain control/breathing
   Dilation

3. Observer: Was the coaching of the mother effective?
   Calm
   Controlled breathing
   Encouragement - almost done… Observer: How would the mother have felt in this case?
   Including the partner?

4. What could the dizziness have been caused by? Associated intervention?
   Pressure on superior vena cava - turn slightly on side
   Hyperventilating - cleansing breath, slow down, paper bag…

5. What were you thinking when Noelle told you that she had to push?
   Is there any assessment that should be done before you encourage her to push? - Dilated
   If she isn't fully dilated what might happen? Tearing, swelling of presenting part, injury
   - What could the nurse encourage the pt to do to prevent pushing too soon? try pant, blow, pant, pant, blow, pant, pant, pant, blow during contraction OR try pant, pant, pant, blow, pant, pant, pant, blow

6. How did you prepare for the delivery?
   Positioning/ supporting legs
   Cleansing perineum
   Equipment available
   Gloves/ eye protection/ gown
   Instructing the mother to push with open glottis - If closed can stim vagal nerve and drop BP

7. Family: how did you feel during the scenario? Is there anything they could have done to encourage you to help more? Did they answer your questions?
   Effleurage - stroking abd closes nerve endings
   Ball - counter pressure on back

8. Was the care safe following delivery? For the baby? APGAR, warmth, airway/suctioning

For the mom? Haemorrhage, comfort? Fundal massage? Why would breast feeding be beneficial? Bonding + contraction of uterus

9. Were you satisfied with your ability to work through the simulation?

10. To Observer: Could the nurses have handled any aspects of the simulation differently?

11. If you were able to do this again, how could you have handled the situation differently?

12. What did the group do well?

13. How did they work as a team?

14. Is there anything else you would like to discuss?

Complexity – Simple to Complex

Suggestions for Changing the Complexity of This Scenario to Adapt to Different Levels of Learners – basic first year level

Noelle Blaze Report from the staff nurse

Time: It is now 0730

You have been assigned to assist in the care of Noelle Blaze, a 26 year old who has been admitted to your unit. She has been in labour for 6 hours; membranes have ruptured and mom is currently having 45 second contractions, 3 minutes apart. Refusing analgesics. Vitals– 120/72, 95, 24, T 37.2 Sat 97%. Fetal heart rate 145 / min

You need to check that we have everything set up in the room. Stay with Noelle and her family member and check and see how she is progressing including the fetal heart rate. I'll be back when I get a chance.

PN Sem 2 OBS Scenario – Faculty Debriefing Check List

Action	Done	Comments
Washes hands –		
Introduces self to pt (name, occupation – student nurse, purpose) & Family		
Explains that will be doing assessment Contractions - duration, frequency		
Checks fetal Heart rate		
Checks for cervical dilation - gloves on		
Coaches with breathing		
Dizzy – Turns on side		
Shows family effluerage		
Hyperventilating – coaches with breathing		
Checks is Fully dilated before pushing/ positions mom/ coaches with breathing		
Cleanses perineum		
Supports Head and suctions		
BSP?		
Encouraging mother throughout		
Babe assessed – placed skin to skin		
Babe kept warm		
Placenta delivered and checked		
Checks mom for haemorrhage - fundal massage		
Apgar for baby		
Position for Breast feeding - Skin/skin		
Delegation/ Team work		
Explains what is doing throughout		
Other		

Labour and Delivery Scenario Family Cues

Timing (approximate)	**Mannequin Actions**	**Husband/ Sister May Use the Following Cues**
0- 3 **Slowest setting on Noelle – on pause** **HR 160** **Right Occiput Anterior position** **Contractions about 30 sec apart**	**" Oh here's another one!" breathing deeply**	****Turn on Noelle** *Relaxation techniques* – **"You need to relax Noelle….Let your arm relax, now let your shoulders relax, now let your neck relax…"**
	" Oh here's another one!" breathing deeply	**"How are things going? Is it time yet? How much is she dilated?"**
3-5	I'm feeling dizzy, is there anything you can do to help? – **" Oh here's another one!" breathing deeply**	*Effluerage* – **"What were we supposed to do on her stomach?" " I remember something about stroking it??? – Can you show me how to do it?"** ***Keep your hand on the fundal area -*
5 – 10 **(increases force at about 8 min)**	"This breathing isn't helping!!!!!" "Here's another one" Cleansing breath… rapid modified breathing and cleansing breath	**"What's happening is it time yet?" Her stomach felt like a rock during that last contraction**
	"Here's another one" Cleansing breath… very rapid breathing …cleansing breath **I'm getting dizzy again…my lips and face are getting numb**	**"I think she's hyperventilating" Can you see the baby's head? Can you see the baby's head??? *… **If can see the head* …Noelle, we can see her head!**
10- 15	"Here's another one" I need to push!!!!	***Pick up the ball on the over bed table*
	I need to PUSH!!!!!!	
15 – 20	**Oh, I did it… "Here's another one!" I want to see my baby!**	***Stunned* – "**What was I supposed to do with this ball?"**

Appendix N

Semi-Structured Interview Questionnaire for Students

Student Interview Questions - Guide

I am trying to gather more information on the simulation-based practice lab that you experienced at the Confederation College campus in Thunder Bay.

I am interested in your comments on how you felt about the simulated lab experience. I have questions to help guide this interview but please feel free to add any comment, or refuse to answer any question during our conversation. You may end the interview at any time.

First however, I would like your permission to tape record our conversation for accuracy.

1. How did you find the simulation experience?
2. Do you feel the simulation experience helped you to better understand the maternal-newborn content from the March videoconference class? Can you explain how?
3. Did you feel that the experience contributed to the development of your clinical skills? If yes, can you name a specific event in the simulation that was beneficial to that development?
4. What types of things that you learned in the simulation-based lab will help you in the clinical placement setting? (Probing question: Can you further explain how they will help?)
5. What was it like to work together as a group?
6. Did the presence of other students in the simulation help you with your learning? If so, can you explain how?
7. Do you have any additional comments that you would like to add?

Appendix O

Semi-Structured Interview Questionnaire for Lab Facilitators

Facilitator Interview Questions - Guide

I am trying to gather more information on the simulation-based practice lab that you facilitated at the Confederation College campus in Thunder Bay.

As a facilitator in the simulation-based practice lab I am interested in your comments on how you felt about experience. I have questions to help guide this interview but please feel free to add any comment, or refuse to answer any question during our conversation. You may end the interview at any time.

First however, I would like your permission to tape record our conversation for accuracy.

1. How many years have you taught in the nursing program?
2. What is your clinical expertise?
3. How did you find the simulation experience?
4. Were you comfortable with the simulations that were used? Can you explain how?
5. Did you require any assistance to learn about the technology? Or your role as facilitator?
6. Do you have any additional comments that you would like to add?

Appendix P

Semi-Structured Interview Questionnaire for Clinical Placement Instructors

Clinical Placement Instructor - Interview Questions - Guide

I am interested in gathering more information on a simulation-based practice lab that took place at the Confederation College campus in Thunder Bay.

As a clinical placement instructor for the Practical Nursing students that took part in the simulation-based practice lab I am interested in your evaluation of their learning outcomes such as skill performance and self-confidence since they took part in the experience. I have questions to help guide this interview but please feel free to add any comment, or refuse to answer any question during our conversation. You may end the interview at any time.

First however, I would like your permission to tape record our conversation for accuracy.

1. What clinical placement area are you currently working with the students in?
2. Have you supervised clinical placement with them before this rotation?
3. Have you noticed a change in their skill performance after participating in the simulation-based lab?
4. Have you noticed a change in their self-confidence after participating in the simulation-based lab?
5. Do you have any additional comments that you would like to add?

Appendix Q

Athabasca University Research Ethics Board Approval

Athabasca University
Canada's Open University

MEMORANDUM

DATE: February 25, 2010

TO: Debra Walker

COPY: Dr. Susan Moisey (Research Supervisor)
Janice Green, Secretary, Research Ethics Board

FROM: **Dr. Simon Nuttgens, Chair, Research Ethics Board**

SUBJECT: **Ethics Proposal #09-78: *"Using Simulation-Based Practice Labs to Promote Instructional Effectiveness and Community Cohesion in a Blended Nursing Program"***

The Athabasca University Research Ethics Board reviewed the above-noted proposal and supporting documentation. I am pleased to advise that this project has been granted **FULL APPROVAL** on ethical grounds.

The approval for the study "as presented" is **valid for a period of 12 months from the date of this memo**. If required, an extension must be sought in writing prior to the expiry of the existing approval.

A final Progress Report (form) is to be submitted when the research project is completed. The reporting form can be found online at http://www.athabascau.ca/research/ethics/.

As you progress with implementation of the proposal, if you need to make any changes or modifications please forward this information to the Research Ethics Board as soon as possible. If you have any questions, please do not hesitate to contact rebsec@athabascau.ca

Appendix R

Confederation College Research Ethics Committee Approval

Confederation
COLLEGE

P.O. Box 398, 1450 Nakina Drive, Thunder Bay Ontario Canada P7C 4W1
Telephone: (807) 475-6110 Facsimile: (807) 475-6698 Toll-free: 1-800-465-5493 (in Ontario and Manitoba)
Website: www.confederationc.on.ca

Debra Walker

Faculty, Practical Nursing Program

School of Health and Community Services

Confederation College

Dear Debra:

This is to certify that the Confederation College Research Committee has examined the application for ethical approval for the research project:

Using Simulation-Based Practice Labs to Promote Instructional Effectiveness and Community Cohesion in a Blended Nursing Program

The members of the Research Committee found that the research met the appropriate ethical standards.

Judy Barton — Feb 9/10

Judy Barton
Date

Chair, Research Committee

Confederation College

Judi Maundrell — Feb. 9/10

Judi Maundrell
Date

Vice-President Academic

Confederation College

Appendix S

Copyright Permission to Use NLN Materials

National League for Nursing

April 20, 2012

Debra Walker
Coordinator & Professor PSW/Professor PN
School of Health & Community Services
1450 Nakina Dr., PO Box 398
Confederation College
Thunder Bay, ON P7C 4W1
Debra.Walker@confederationc.on.ca

Dear Ms. Walker:

I am writing in response to your request for permission to use NLN materials for your dissertation at Confederation College.

NLN Material Copyright Request

1. Utilize the following NLN Research Tools in your dissertation:
    a. Simulation Design Scale
    b. Educational Practices Questionnaire
    c. Student Satisfaction and Self-Confidence in Learning instrument
2. Include the following NLN Research Tools within the Appendix of your dissertation:
    a. Simulation Design Scale
    b. Educational Practices Questionnaire
    c. Student Satisfaction and Self-Confidence in Learning instrument
3. Include the Nursing Education Simulation Framework from the publication listed below in your dissertation.

    Jeffries, P. & Rodgers, K. (2007). Theoretical framework for simulation design. In P. Jeffreis (Ed.) Simulation in nursing education: From conceptualization to evaluation (pp. 21-33). New York: National League for Nursing.

Permission Granted to:

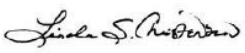
1. Utilize the following NLN Research Tools in your dissertation:
    a. Simulation Design Scale
    b. Educational Practices Questionnaire
    c. Student Satisfaction and Self-Confidence in Learning instrument
2. Include the following NLN Research Tools within the Appendix of your dissertation:
    a. Simulation Design Scale
    b. Educational Practices Questionnaire
    c. Student Satisfaction and Self-Confidence in Learning instrument
3. Include the Nursing Education Simulation Framework from the publication listed above in your dissertation.

In granting permission to include the material noted above, it is understood that the following assumptions operate and "caveats" will be respected:

- The material will be included only in your dissertation.
- The material will not be modified in any way.
- The material will be cited as noted above.
- The dissertation in which the requested material appears will acknowledge that it has been included with the permission of the National League for Nursing, New York, NY
- The National League for Nursing owns these rights being granted
- No fees are being charged by the NLN for this permission.

I am pleased that material published by the NLN is seen as valuable, and I'm pleased that we are able to grant permission for its use. Please call me *(212-812-0329)* with any questions about items noted in this letter. Thank you.

Most sincerely,



Linda S. Christensen, JD, MSN, RN
Chief Administration Officer
National League for Nursing