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NURSE EDUCATOR EXPERIENCES OF VIRTUAL SIMULATION DEBRIEFING PRACTICES

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Dedication

I would like to dedicate this dissertation to my late brother Carl Rayaz Jadunandan. May God always grant you light and space.

Acknowledgement

First and foremost, I would like to thank God, the beneficent, the most merciful. Only through his grace and mercy could I get to this point in my journey, and I am forever indebted in gratitude.

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I have been blessed to have people in my life who have been instrumental in successfully completing this dissertation. I have spent countless hours in the virtual library with my incredible cohort members, who have inspired and motivated me. Mae has a special thanks; we have spent many late nights and early mornings writing what we thought were final drafts.

From the bottom of my heart, I want to sincerely thank my family, Motie, Anela, Ny, Zee, and Alyia, who believed in me even before I believed in myself. To my loving husband Darren, I cannot express how grateful I am for your support; thank you for always being on my team.

As Isaac Newton said, "If I have seen a little further, it is by standing on the shoulders of Giants."

Thank you for being the giants in my life.

Abstract

Simulation education provides unique experiential learning that enables nursing students to engage in clinical scenarios that replicate authentic clinical situations without causing harm to others or themselves. Simulation education has become a widely accepted and beneficial teaching modality in nursing curricula across Canada and globally. Virtual simulation was an essential part of nursing curricula before the pandemic. Even as the pandemic ends, the use of virtual simulation will continue to be integrated into nursing curricula as it offers an educational modality that supports students in meeting learning outcomes while accommodating the concern for the spread of infectious disease. Bound to the virtual simulation experience is instructor-led simulation debriefing, in which nurse educators guide students through critical reflection based on what happened during the simulation. However, research on nurse educators' development and instructional strategies in virtual simulation debriefing is scarce. This study was grounded in interpretive phenomenology and utilized semi-structured interviews of seven participants to explore nurse educator experiences about virtual simulation online debriefing practices at a single post-secondary institution in Ontario. After inductive coding, the results showed that the four main themes that emerged from the data were, *Demographics and Prerequisites of Virtual Simulation (VS) Debriefers, Improvement and Contribution to Best Practice, Experiences and Challenges of VS Debriefing,* and *Benefits and Opportunities of VS and Debriefing.* The findings suggest the implementation of formative evaluation of debriefing practices can provide valuable insight for improved instructional design and innovative practice change that extend beyond nursing education.

Keywords: high-fidelity simulation, virtual simulation, debriefing, nurse educators, nursing students, experiential learning

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Clinical Reasoning

Clinical reasoning is done by an individual who connects thinking (cognition) and reflective thinking (metacognition) to gather and comprehend data while recalling knowledge and skills about a situation as it unfolds. After analysis, information is put together into meaningful conclusions to determine alternative action (Dreifuerst, 2012).

Clinical Scenario

The plan of an expected and potential course of events for a simulated clinical experience.

Conceptual Framework

A visual representation of the study's research process, it shows the organization of main conceptualizations and ideas.

Constructivist Theoretical Framework

This philosophy holds that people actively construct their knowledge depending on their reality and experiences. In constructivism, learning is a process of discovery whereby the learner seeks to understand issues, guiding the individually relevant discovery process (Fosnot, 2013).

Debriefer

The debriefer is an individual who facilitates a debriefing session after the simulation. The debriefer is typically knowledgeable and skilled in performing appropriate, structured, and psychologically safe debriefing sessions (Centre for Medical Simulation, 2016).

Debriefing

A debriefing is a process immediately following a simulation. It is led by a trained facilitator using an evidence-based debriefing model. Participants' reflective thinking is encouraged, and feedback is provided regarding the participants' performance while various aspects of the completed simulation are discussed. The students are encouraged to explore emotions and question, reflect, and give feedback to other students, and the nurse educator provides feedback to students (Lopreiato et al., 2016).

Distance Education

Distance Education (DE), also recognized as online learning, is “fully planned online and organized teaching and learning in which learners are separated from teachers or facilitators in time and space" (Bozkurt, 2019, p. 261).

Faculty Advisor

The nursing educator that oversees and facilitates the virtual simulation debriefing in the Year four program for this study.

Fidelity

Fidelity is described as “The ability of the simulation to reproduce the reactions, interactions, and responses of the real-world counterpart. It is not constrained to a certain type of simulation modality, and higher levels of fidelity are not required for a simulation to be successful” (Lopreiato et al., 2016, p. 12).

Formative Evaluation

Formative evaluation is an approach to assessment that aims to provide both the students and instructor with a gauge of where their level of understanding is at the

current moment; it allows adjustment and iteration to the learning process (Lee et al., 2017).

Formative Evaluation in Instructional Design (ID)

Formative evaluation occurs during instructional design. It is the process of evaluating instruction and instructional materials to obtain feedback that drives revisions to make instruction more efficient and effective (Ibrahim, 2015).

High Fidelity Simulation

High fidelity simulation refers to the use of sophisticated life-like mannequins (Arthur et al., 2011). The environment determines the level of fidelity, including tools, educational technologies, and resources.

The International Nursing Association for Clinical Simulation and Learning (Healthcare Simulation Standards of Best Practices [HSSBP™])

The International Nursing Association for Clinical Simulation and Learning (INACSL, SOBP, 2021) is currently the leader in development of best practices for simulation standards to ensure evidence informed simulation education and research. Prior to 2021, the (HSSBP) were referred to as the standards of best practice (SOBP).

National League of Nurses (NLN) NLN Jeffries Simulation Framework

The NLN-Jeffries Simulation Framework provides nurse educators with a clear direction between the different concepts and variables to predict positive educational outcomes (Jeffries, 2016) and for the assessment and evaluation of the simulation outcomes.

Nurse Educator

A nurse educator is a Registered Nurse with advanced post-secondary education who provides evidence-based guidance, support, and structure for simulation-based learning, including virtual simulation activities and debriefing (Shellenbarger, 2018).

Nursing Student

A nursing student is, in this research, a student in a post-secondary nursing education program that leads to a license to practise nursing (Gagnon & Roberge, 2012).

NVivo

NVivo is a software program used for qualitative and mixed-methods research. Specifically, it is used to analyze the unstructured text, audio, video, and image data.

Preceptor

The preceptor is the Registered Nurse in a healthcare facility paired with a year 4 student to provide important mentoring, teaching, and learning experiences for the learner. In addition, the preceptor directly supervises the student in the clinical setting.

Phenomenological Heuristic Inquiry

Phenomenological research aims to describe the essential structures of a phenomenon. In a heuristic inquiry, the data are presented in the form of individual portraits of the researcher and participants. The portraits contain in-depth experiential data highlighting the individual experience (Sloan & Bowe, 2014).

Prebriefing

The prebriefing is where the preliminary information, including the function of the equipment, is reviewed with the participants. The participants are reminded of the

scenario's learning objectives. The prebriefing is recognized as the collaboration and planning of co-facilitators/co-debriefers prior to the simulation activity (INACSL, 2021).

Sessional Employment

In this study, sessional employment is defined as a short-term teaching contract for four months and less than 12 hours a week.

Screen-Based Simulation

A simulation is presented on a computer screen using graphical images and text, similar to popular gaming format, where the operator interacts with the interface using a keyboard, mouse, joystick, or other input devices (Lopreiato et al., 2016).

Simulation

Simulation is an educational strategy in which a particular set of conditions creates an artificial healthcare scenario that mimics potential real-life situations in education and practice, in this case, nursing. Simulation activities allow participants to develop their knowledge, skills, and attitudes and respond to realistic situations in a simulated environment (Lopreiato et al., 2016).

Training

In the context of this study, the term *training* represents the terminology sometimes used in the literature to describe methods to improve competency levels necessary for nursing professionals (Fukada, 2018).

Virtual Reality

"A computer-generated three-dimensional environment that gives an immersion effect" (Kardong-Edgren et al., 2019, p. 40).

Virtual Simulation (VS)

Virtual simulation is "the modelling of real-life processes with inputs and outputs exclusively confined to a computer, usually associated with a monitor and a keyboard or other simple assistive devices" (Lopreiato et al., 2016, p. 6).

Chapter 1: Introduction

The nursing profession requires nurses to care for patients with complex needs and be prepared to make instantaneous decisions that necessitate specific knowledge and clinical judgment skills. Simulation education has been widely recognized in the healthcare professions, specifically nursing, because it has the advantage of facilitating learning and skill acquisition in a safe environment (Baily, 2019). Breymier et al. (2015) conducted a National Simulation Study, which indicated that out of over 300 prelicensure nursing programs, over 95% use simulation, which demonstrates that simulation is widely accepted and regarded as beneficial to nursing education. Simulation education in nursing is not a new concept—it has been increasingly common as an effective approach for teaching procedural skills, developing interprofessional team collaboration, clinical reasoning, and reflective practice skills (Hughes & Hughes, 2019; Lavoie & Clarke, 2017).

An integral part of the simulation is debriefing. Instructor-led debriefing supports students in assimilating experience and knowledge for meaningful learning. Nursing students are expected to complete clinical placements; however, there is a limited number of clinical sites available for hands-on education, which the COVID-19 pandemic has further reduced. Virtual simulation (VS), which uses screen-based simulations to recreate a clinical environment, offers an innovative approach to experiential learning through distance education (Fogg et al., 2020). Despite the abundance of research about simulation, debriefing practices relating to the virtual environment are minimal (Breymier et al., 2015).

This chapter aims to provide background information on simulation and its integration into distance education as a valuable teaching modality to increase positive learning outcomes. This study differentiates between the roles of the nurse educator and student. Then, those roles

will be examined in a virtual simulation, using the vSim for Nursing™ for software, as it is the context of this study. Once the background and context are established, the research problem, purpose, theoretical framework, limitations, and delimitations are discussed to better understand what the research aimed to achieve. The study uses the NLN Jeffries Simulation Framework (2016) (Appendix A) as the theoretical framework. At the end of the chapter, the problem's significance is examined; the study contributes to improving the nurse educator's experience of the debriefing process. The chapter includes my experience as a junior faculty member and my experience in recognizing inequities between adjunct and full-time faculty. Therefore, Chapter 1 describes the basis for this study.

Historically, simulation education dates back to World War II (WWII), when flying simulators were used to support pilot training (Aebersold, 2018; Bailey & Mixer, 2018). Despite its early educational use, simulation has only been widely used and accepted as a teaching technique over the last two decades to reconstruct real-life experiences in various disciplines (Baily, 2019). Disciplines that use simulation-based learning include aviation, hotel hospitality, engineering, accounting, and aerospace (Aebersold & Tschannen, 2013; Baily, 2019). In nursing, the first use of a simulated patient was in 1911, when a life-sized mannequin was used to teach nurses how to transfer and dress patients (Aebersold, 2016).

Simulation-based education in the context of nursing is a teaching modality used to replicate a clinical environment in which students can practice nursing interventions without risking harm to actual patients, typically done through the use of high-fidelity mannequins (Norman, 2012). High-fidelity Simulation (HFS) utilizes mannequins which are technologically advanced models that are anatomically and physiologically created as human beings and safely allow for clinical skills training. In collaboration with trained facilitators, high-fidelity

mannequins can foster students' clinical skills such as giving injections, cardiopulmonary resuscitation (CPR), mental health intervention, and medication administration (Baily, 2019; Waznonis, 2014). In contrast, virtual simulation uses a computer screen-based program to simulate a virtual patient and healthcare environment that responds to the students' interventions, who select the appropriate actions on the computer (Lopreiato et al., 2016). Both in-person and virtual simulation debriefing are foundational to learning. Well-prepared faculty members who lead debriefing support the development of competent future practitioners equipped to handle even the most complex patient care situation.

The simulation environment has been shown to improve clinical practice and student self-efficacy (Mullen & Byrd, 2013). In-person simulation education in nursing has become an established and invaluable part of nursing curricula to develop competency and evidence-based practice for entry-level nursing outcomes, including providing safe, ethical, competent, client-centred and informed nursing care across the lifespan (Konrad et al., 2021).

In 2020, the world was profoundly affected by unprecedented changes during the COVID-19 pandemic. It presented a high risk of spreading the virus to nurse educators, students, patients, and the community. In response to the increased risk, clinical sites, including hospitals and long-term care facilities, greatly restricted student placements as a means to reduce patient and staff interaction to decrease the likelihood of spreading the virus (Fogg et al., 2020). The pandemic shed light on the pivotal role that nurses play in healthcare and education. There is a need to understand how to continue nursing education and experiential learning safely (Konrad et al., 2021). Nurses and healthcare providers alike were at the forefront of the pandemic. Therefore, there was an even more dire need for educational institutions to find innovative ways to have students meet the intended learning objectives required for clinical practice while

accommodating the need to have less direct contact with one another. Through innovations in simulation technology and as a result of COVID-19, there has been an increase in clinical virtual simulation in nursing curricula. It is recognized as the recreation of reality depicted on a computer screen and involves real people operating simulated systems (Verkuyl et al., 2020). As virtual simulation allows learners to practice clinical reasoning, decision skills, and communication skills without being in the same place as the nurse educator or other students, there has been an expansive uptake of this learning modality and calls for innovative debriefing design (Verkuyl et al., 2020). Clinical virtual simulation can provide a pedagogical teaching and learning modality that can facilitate knowledge retention and improve self-efficacy for learners (Sofer, 2018).

The Components of Simulation

Prebriefing is the discussion between the nurse educator and the group of students who participate in the simulation scenario. The researcher draws on her own experience in this section as discussed later in the proposal. The prebriefing occurs before the case scenario. The nurse educator describes the upcoming context of the case scenario, offers preliminary information and describes the background of the patient being cared for (Chmil, 2016). A prebriefing in nursing simulation includes logistic details about the scenario, including a medical history of the simulated patient, age, gender, pertinent medical issues, the nurse's role in that scenario and an indication of available equipment. The prebriefing includes the goal for that particular patient and learning outcomes for the students. Prebriefing plays a significant role in setting the stage for a scenario while supporting the learner in achieving the objectives (Dileone et al., 2020). Prebriefing itself is not a new concept. It has been used in healthcare and many other disciplines such as aviation, aerospace, and engineering to provide contextual information that will allow the

learner to act appropriately in the simulation. Berman et al. (2016) pointed out that prebriefing is vital to clarifying expectations, assisting the learner in suspending disbelief, and supporting engagement during the simulation. Concerning student outcomes, explicit instruction provided before the scenario is advantageous in improving learner performance, reducing disruptions during medical procedures and improving communication (McGrath et al., 2018). Prebriefing creates a context for the case scenario and communicates that learners will be respected and in a safe learning environment, contributing to students' physiological safety (Pinar, 2020).

The second part of simulation training is the simulation scenario or event: the hands-on/psychomotor or immersive experience, either in person or virtually, using simulation education software. During the simulation scenario, the student encounters a simulated patient; during this time, the student can provide appropriate interventions. This second part reflects what the student would encounter in clinical practice. The simulations are designed to create authentic learning experiences that mimic realistic situations. Real clinical cases inspire the scenarios. The design of simulation is critical in supporting student learning; it is evidence-based and specific to what skills the student needs to develop. The simulation scenario requires a meticulous instructional design that considers the situation and the simulation modality, the level of authenticity needed, and the feasibility of creating specific learning environments (Rim & Shin, 2020). For this study, the modality was a virtual simulation using the vSim for Nursing™ for software: the students encountered the simulation scenario asynchronously and debriefed with the nurse educator synchronously.

The simulation scenario is designed to allow students to assess, gather information and provide interventions to a simulated patient that responds in a way that a human patient typically would. The simulation scenarios for in-person labs are 10-15 minutes, but virtual simulation lasts

approximately 30 minutes. The in-person simulations are often shorter as students work as a team versus going through the simulation individually in a virtual simulation. The next phase of debriefing is longer than the simulation itself, as it critically analyzes the rationale of the nursing interventions. Students are encouraged to discuss their rationale for their interventions (Rim & Shin, 2020).

The third part of simulation training is recognized as the debriefing, which is inseparably bound to the simulation experience. It has been recognized as one of the most effective nursing simulation learning cornerstones (INACSL, 2016; Jeffries, 2016; Waznonis, 2014). Debriefing is intentional dialogue after, in this case, the virtual simulation experience, led by a nurse educator, also recognized as the debriefer**,** which encourages enhanced student comprehension and learning. Even though the value of debriefing in nursing education is well established, there is a lack of research that relates to the debriefer's ability to support and evaluate simulation in a virtual setting (Williams et al., 2020). The World Health Organization (2016) posits that nursing education requires the nurse educator to create and maintain a safe environment conducive to learning in theoretical, clinical simulation, and practice settings. Reigeluth (2013) explained that the learner's role in simulation is dynamic and involves peers and instructional agents; therefore, as instructional functions progress, there is an increasing responsibility for support in learning tasks. Thus, the development and integration of simulation learning in nursing require the debriefer to have access to support, education, and training that will, in turn, foster rich educational experiences and well-informed instructional design (Rim & Shin, 2021).

In-person and Virtual Simulation

Simulation practice labs have traditionally been done in an in-person setting. Although this study examined virtual simulation and debriefing practices, it is essential to understand how

in-person simulation labs are conducted to identify the difference between this type of simulation and virtual simulation. Typically, in-person simulation labs have three areas. The first is the simulation event area with the high-fidelity or low-fidelity mannequin, where the scenarios occur. Based on the simulation scenario, the educator sets up the simulation with the necessary equipment before students enter the room. Simulations are designed to replicate clinical situations that represent the clinical setting—all students experience the same scenario and setup, there is often the ability to review video and audio recordings of the simulation. The second area is the control room, where the educator observes the students interacting in the patient care area through a one-way mirror. A typical group consists of 6-8 students per instructor. The rationale for this is that 6-8 students would be in a clinical setting. However, only 2-3 students enter the simulated patient area at once. The smaller sub-groups allow each student to have a more active role in the simulation while still acting in a team-based and collaborative manner. The third area is the debriefing area. This area is where the nurse educator and students, in the entire group of 6-8 people, discuss what happened during the scenario. In most cases, the audio and video recordings are played back so that interventions can be reviewed, paused, and discussed.

Once the scene is set up, the nurse educator leaves the lab area and enters the control room. The student group enters the simulation scenario area to complete the simulation's interventions; the simulation takes approximately 10 minutes. The prebriefing happens in this simulation event area room with the nurse educator. Both in virtual simulation and in-person simulation, the nurse educator may lead students through this process, or sometimes students may do this independently, allowing them to see the equipment available and be introduced to the scenario environment. During the prebriefing, student learners are reminded of the intended learning outcomes and skills expected to be developed. The skills vary based on the scenario. For

example, an intended skill for students to build may be assessing the cardiovascular and respiratory systems. The simulation scenario would have a mannequin experiencing cardiovascular and respiratory challenges to support students as they develop skills in assessing those specific challenges (Aebersold, 2018).

In contrast, virtual simulation is based on a virtual patient being assessed through screen-based interactive patient scenarios supported by physiological algorithms (Padilha et al., 2019). Thus, virtual simulation means that based upon the student's choice of intervention in the simulation program, the simulated patient responds in realistic ways that mimic real-life clinical situations. Virtual simulation is comprised of the same components of a prebriefing, simulation event, and debriefing. The significant difference is its delivery through a computer screen, making it more accessible and valuable in DE and blended programs. Also, as virtual simulation requires fewer resources such as HFS mannequins and physical classroom space, there is an even greater opportunity for students to be exposed to diverse patient scenarios. In infectious disease outbreaks, hospital policies typically indicate that students are not allowed in the clinical setting until infection rates have decreased due to the risk of spreading an infection to others. However, nursing education continues, and students still need to complete clinical hours; simulation could be included in 20-25% of total clinical hours (Hayden et al., 2014). For example, if the student is required to have 100 clinical hours, 50 of the hours could be in clinical, and 50 of the hours may be in a simulation. As clinical practice standards and regulations continue to change and update, the virtual simulation environment is increasingly used as a safe way for students to improve practice and application techniques (Shin et al., 2015).

Simulation Roles

Nurse educators are Registered Nurses with advanced education, typically possessing a graduate degree in nursing, healthcare management, or equivalent. Nurse educators help facilitate the acquisition of knowledge and skills after the simulation through debriefing, which is used to prepare nursing students for competent clinical practice. In 2021, INACSL's HSSBP™ explained a continual need for faculty development to maintain the quality and consistency of simulation activities. Although there are certifications available for simulation educators, it is not mandatory for all Ontario colleges, universities, and hospitals. Thus, simulation certification and faculty development are important areas to explore in the context of improved quality of virtual simulation debriefing. Nursing students are persons enrolled in a post-secondary nursing educational program that leads to a license to practice as a Registered Nurse (CNO, 2016).

This study was conducted at a single institution—an Ontario university, where the BScN program's implementation of virtual simulation debriefing strategies in an online environment was explored.

Context of the Study

This research examined the virtual simulation debriefing experienced by nurse educators using the simulation program named vSim for Nursing™. The program was developed in 2014 by a collaboration of Wolters Kluwer Health, Laerdal Medical and the National League for Nursing. vSim for Nursing™ is a virtual simulation software used to provide online, hands-on nursing practice to immerse students in realistic patient interactions (Tjoflåt et al., 2018).

This study examined nurse educators' perspectives at a university in Ontario that teaches in the fourth year of the BScN program using vSim for Nursing™ as the software for virtual simulation and debriefing. The four-year collaborative degree program is offered in partnership

with two colleges. For the first two years of the program, students complete their studies at the college and the final two years of their studies at the university. The teaching is shared by university and college faculty in all years. The BScN program is designed to prepare students to successfully pass the National Council Licensure Examination (NCLEX), required for graduates to become a Registered Nurse. The license is needed to work as a Registered Nurse in Canada.

Year four of the program is comprised of two semesters, each comprising one course (NSE 417 and NSE 418); both courses require virtual simulation hours using vSim for Nursing™. During the 2020 COVID-19 pandemic, when access to clinical sites for student placement was limited, some students were assigned more virtual simulation hours than in-person clinical time; this was based on the proportion of the available clinical time at a specific location such as a hospital. Different institutions regulate student placements and hours independently; they are not regulated across the province or all hospitals. Some students may have more clinical time available than others. The nursing education system accepts virtual and in-person simulation as equivalent within limits. All year four students must participate in both in-person clinical and virtual simulation during NSE 417 and NSE 418 to be eligible for graduation. The International Association for Clinical Simulation and Learning (INACSL, 2016) explained that simulation best practice includes a sufficient prebriefing that reinforces defined learning objectives and establishes a simulation scenario and adequate debriefing. Discussing the three different parts of the simulation facilitates an understanding of the context in which this study takes place.

September 2020 was the first implementation and requirement of virtual simulation practice in the program being studied. In-person simulation labs and virtual simulation labs consist of the same three phases: prebriefing, simulation, and debriefing. In the context of this

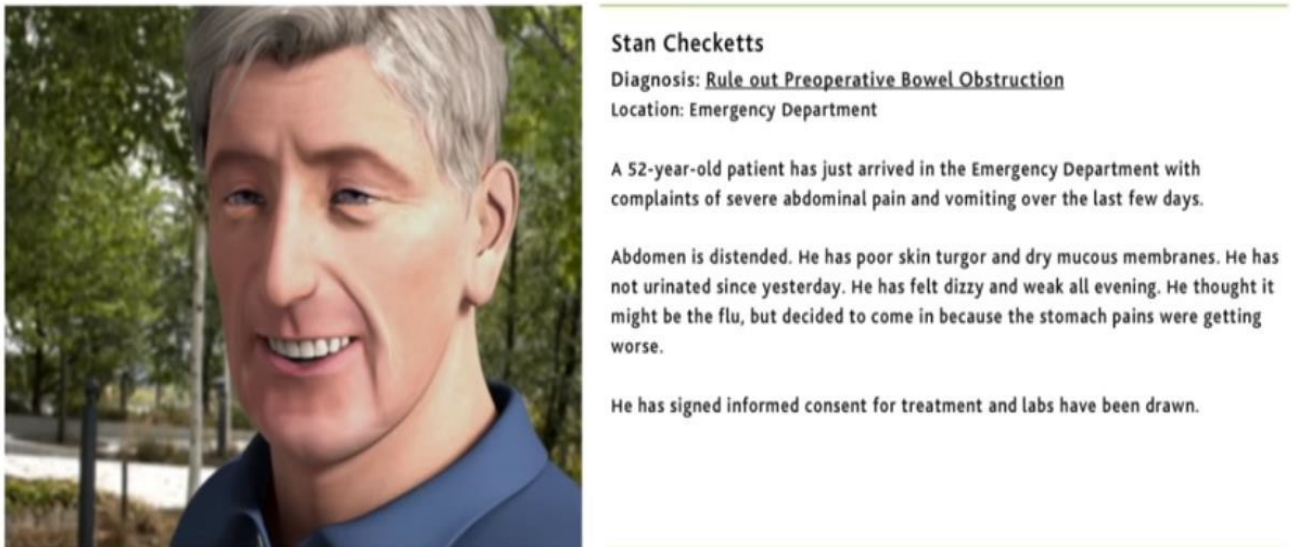
study, publicly available images from the vSim for Nursing™ virtual simulation program were used to provide an understanding of what the nurse educators were working with. Understanding the virtual simulation process in this study provides insight and understanding of the simulation, which is valuable as debriefing builds off the simulation itself. An example of the prebrief dialogue is as follows.

> This is Mr. Stan Checkettes; he is a 52-year-old male who arrived in the emergency department with complaints of severe abdominal pain and vomiting over the last few days. His assessment shows that his abdomen is distended. He has poor skin turgor and dry mucosa membranes. He has felt dizzy and weak all evening. He thought it might be the flu but decided to come in because his stomach pains worsened. His diagnosis is to rule out a pre-operative bowel obstruction; he is located in the emergency department.

Figure 1 provides a visual example of how the prebriefing information is presented to the student in the vSim for Nursing™ program.

Figure 1

Example of vSim for Nursing™ for Prebriefing Information



Following the prebriefing is the simulation event. This phase-in simulation is when students are actively engaged in using clinical decision-making to provide interventions for the simulated patient. During the vSim for Nursing™, the student is expected to check safety measures, communicate with the patient by selecting the appropriate assessments for this patient's condition, provide nursing interventions, administer medications from the physician's orders, review tests and diagnostic material, and document care.

Figure 2

Example of vSim for Nursing™ Simulation Event

During the simulation event in vSim for Nursing™, the student chooses an intervention, which is then reflected in the patient's condition and applied to the virtual patient. For example, suppose the student chooses to apply oxygen to the virtual patient. In that case, the virtual patient changes to wearing an oxygen device, and the screen will display the outcome of the

intervention, for example, whether the patient's condition reflects a realistic outcome such as an improved oxygen level. Figure 3 shows an example of what the student options are. The patient's vital signs are displayed in the lower part of the screen, allowing the student to evaluate his or her intervention.

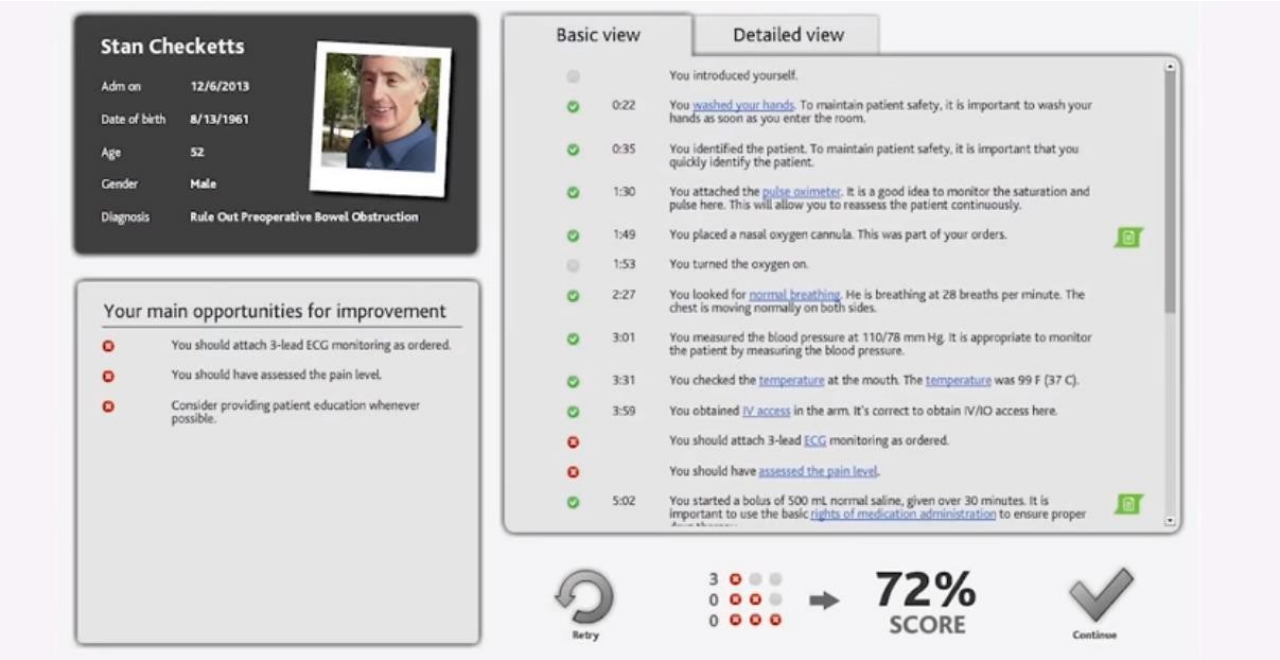
Figure 3

Example of Response to Simulation Intervention by Student

Once the virtual simulation is complete, the students are provided with a summary of interventions to recall their nursing intervention during the simulation and prepare for the debriefing. Figure 4 shows what the student sees after they have provided their nursing intervention. The report provided to students offers an overview of which interventions they chose correctly and a brief rationale as to why that was the correct or incorrect choice. Based on how many answers were correct, the student receives a score, which the instructor can view. The report identifies the main area of improvement specific to that student's simulation performance.

Figure 4

Example of Feedback Given for Intervention in Simulation



Depending on the institution's program, the debriefing is conducted synchronously on an online platform such as Zoom or Blackboard. For the purposes of this study, the debriefing simulation was conducted synchronously on Zoom. In this particular nursing program, the debriefing occurs with 13-14 students at the same time. The nurse educator leads the debriefing, and the groups of students and nursing instructor remain the same throughout the semester.

The process of virtual simulation labs and in-person simulation labs unfolds differently in the online environment. For this study program, one of the most notable differences between the virtual simulation and in-person simulation is that the students go through the simulation independently instead of the small groups going through the simulation scenario in in-person labs. The virtual simulation is not recorded using audio or video. Instead, the nurse educator can view the student's choice of intervention in the simulation experience (Figure 4). After the virtual simulation ends, the nurse educator and students participate in a debriefing to support students in

critical reflection, clinical reasoning, and implications on future practice (Hall & Tori, 2017). The debriefing happens anywhere from immediately after the virtual simulation up to three days post-simulation.

Research Problem

Historically, nursing as a discipline has been committed to evidence-based and theory-driven activities to provide a rationale for practices and interventions (Jeffries, 2016). This commitment to theory and best practices needs to be maintained during the design, implementation, and evaluation of simulation activities. Students are expected to care for patients with evidence-based actions. Despite the abundance of literature on simulation learning itself, there is still a lack of research about virtual simulation debriefing practices, contributing to the complexity of the problem (Hall & Tori, 2017; Kim & Yoo, 2020; Roh & Jang, 2017). With the lack of research in virtual simulation, other challenges, including inequities in faculty development, and accessibility to consistent and reliable bandwidth, also lack recognition and much-needed research (Green et al., 2014). With the emergence of virtual simulation and a swift transition to online learning in nursing, one of the significant problems is that limited research exists on evidence-based strategies for effective debriefing practices in virtual simulation and the standardization of training for nurse educators (Mariani & Doolen, 2016; McAllister et al., 2013). Verkuyl et al. (2017) explained that even though there is empirical work and established best practices for simulation and debriefing for in-person simulation, few resources exist seeking to understand and effectively guide debriefing in a virtual simulation. With the influx of virtual simulation, this is a significant gap. A convenience sample of Registered Nurses who are members of The International Nursing Association for Clinical Simulation and Learning was surveyed to identify areas of simulation that have been well studied, gaps in simulation research,

and obstacles to researching simulation education (Mariani & Doolen, 2016). The study results showed that time, funding, resources, and faculty development were the most considerable obstacles (Mariani & Doolen, 2016). Much less research examines the intricacies and challenges of debriefing compared to the effectiveness of simulation itself. The pool of literature surrounding debriefing is less than simulation; since virtual simulation debriefing is a sub-section of that, it means that there is even less research for virtual simulation debriefing.

Another one of the most challenging aspects of nurse educator debriefing training is that simulation debriefing practices vary significantly from facilitator to facilitator, making them inconsistent (Nagle & Foli, 2020). Without practice that is standardized, the field of virtual simulation fails to provide evidence-based guidelines that encourage the debriefer to frame experiences as the basis for reflection and learning (Nagle & Foli, 2020). The purpose of framing is to interconnect experience, knowledge, context, and reference points to encourage a deeper understanding of the learning process. For debriefing to be fruitful, the nurse educator needs the tools to embed parts of the student experience into familiar knowledge applied to future learning (Nagle & Foli, 2020). For this study, framing was of particular importance because when the nurse educator has the appropriate knowledge and skills to integrate into virtual debriefing, including framing, it sets the groundwork for the assimilation of the student experience, knowledge, and attitudes into their practice. With the assimilation of new knowledge, experience, and attitudinal change, learning is more likely to be meaningful and transferable to practice (Poikela et al., 2015).

Adjunct nursing educators have the knowledge related to their degree in nursing but often lack formal pedagogical skills or adequate preparation for the educator roles in simulation. As the nature of adjunct faculty contracts is typically 4-6 months, the institution does not provide

long-term educational opportunities to facilitate the development of simulation debriefing skills (Stamps et al., 2021). Less funding and professional development opportunities for nursing educators have been associated with the disenchantment of faculty who are continually hired on a contractual basis (Jeffries et al., 2015). If adjunct nursing educators in simulation continue to feel disengaged with professional development, it may cause them to feel isolated and resentful, which reduces the quality of the educational program. The National League for Nursing (NLN) (2016) advocates establishing healthful work environments and facilitating the ongoing career development of nurse faculty. For this study, the focus was to examine the perspectives of nurse educators who conducted the virtual debriefing to address the gap in research and create best practice guidelines through formative evaluation.

To summarize, the problems in virtual simulation debriefing research are complex; they include a lack of research to address the gap in faculty inequities. The paucity of virtual simulation and debriefing research reflects a dire need for educational reform that starts with understanding the foundations of educator experiences.

Purpose

The purpose of this phenomenological study was to understand nurse educators' self-report of the challenges and opportunities with simulation debriefing practices at a single institution. As distance education in nursing has become integral, virtual simulation will follow suit. In an increasingly digital world, without understanding educator experience, educational institutions run the risk of not adequately preparing students for clinical practice, affecting patient safety (Foronda et al., 2017). Simulation without critical reflection guided by nurse educators who have the knowledge and skill to support students in learning can decrease student competency and self-efficacy and, ultimately, the nursing program's quality (Padilha et al.,

2018). In addition, if educational institutions want to stay relevant and evolve alongside educational and healthcare technology, educators' development must be examined. Examining faculty needs and development may be the basis for creating innovative virtual simulation training and practice standards (Smith & Hamilton, 2015).

Main Research Question

The study aimed to examine participant experiences and to investigate their perceptions of facilitating virtual simulation debriefing. This research posed the following question:

What are the experiences of nurse educators who facilitate virtual simulation debriefing sessions?

Situating the Researcher

My motivation for this study was closely related to my experience and passion for being a nurse educator. When I began teaching, I was a junior faculty member. I was aware of the challenges of not being a full-time educator and the inequity that adjunct faculty face (McPherson, 2019). There was less educational, financial, and training support; however, institutional expectations of full-time and adjunct faculty were the same. This experience encouraged me to learn more about simulation actively, outside of the workplace.

I did extensive reading, met with others for informal learning, and took external courses to better support students. My colleagues and I were intimidated to ask for support due to the precarious nature of adjunct jobs and our desire to become established as faculty members before advocating for our learning needs. I wanted to understand where this inequity stemmed from, the factors creating this fragmentation, and how I could change it, not only for myself but also for future educators. Learning about educator inequity helped me understand the gravity of virtual simulation education issues, become more aware of the problem, and potentially discover

innovative change strategies. Finding solutions that encompassed theory, practice, and educational technology was exhilarating and, over time, contributed to my passion for simulation education. My role during the study was an adjunct nursing faculty member.

As virtual simulation in nursing is an educational modality delivered through distance or online learning, the literature review discusses both distance education and nursing as a discipline. As a nursing educator, I am positioned in an interdisciplinary role. My research was grounded in educational literature and nursing literature; thus, I am contributing information and insight into both disciplines. Consequently, by conducting this study that balances educational and nursing-related needs, my research contributes to the importance of integration and collaboration between the two disciplines to construct best practices in a virtual simulation that align with the tenets of education.

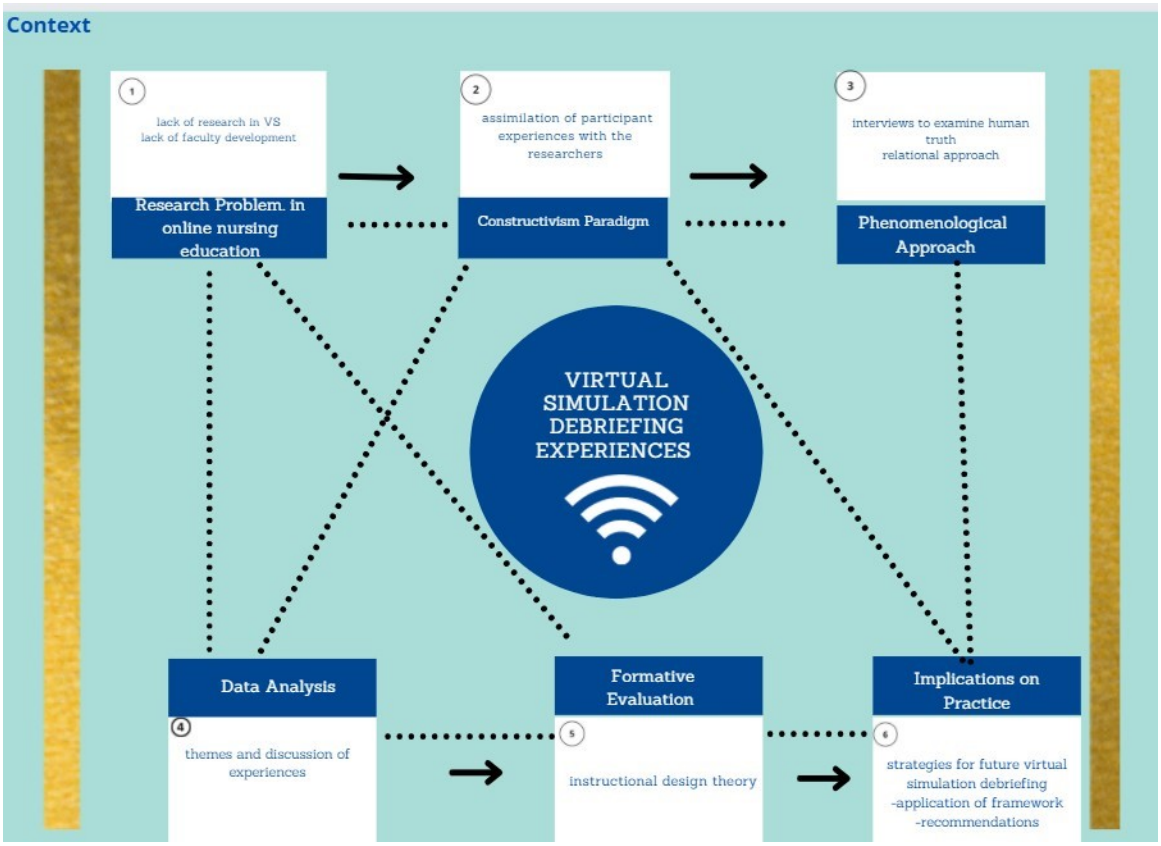
Conceptual Framework

Educator development requires a carefully thought-out instructional design (ID) that acknowledges contextual challenges and current practices (Roussin & Weinstock, 2017). To create nursing curricula where the instructional design is mindful of educators' learning needs, we first need to understand and evaluate its current state as a benchmark before looking to the future. A conceptual framework is a tool used before a study as an analytical tool to make distinctions and bring together different ideas (Ivey, 2015). Robust conceptual frameworks lead to the actual realization of the intended objective. Please see Appendix B for a larger view of the conceptual framework presented in Figure 5. In the conceptual framework, it is important to note that the solid black arrows show the flow of planned phases of the study; the dashed lines indicate the relationships between concepts. The study originates from the research problem in online nursing education, being the lack of research surrounding virtual simulation debriefing in

nursing education. As virtual simulation is a relatively new practice being integrated into the online nursing curriculum, there is an assumption that virtual simulation debriefing practices are the same as in-person debriefing practices. Therefore, online debriefing training does not consider the different needs of nurse educators in the online setting. By not recognizing that virtual simulation debriefing practice is a unique entity within simulation practice, fewer resources are allocated to faculty development and flexible instructional design that consider how virtual debriefing is different from in-person debriefing. As a constructivist researcher, I subscribe to an underlying philosophical assumption there is no objective truth to be known; thus, I approached the research to allow for a variety of interpretations that can be applied to a world (Cleland & Durning, 2015). Using a constructivist research paradigm to approach the study, I employed naturalistic inquiry through semi-structured interviews to support the construction of meaning (Cleland & Durning, 2015). Therefore, the conceptual framework informs the data collection, demonstrated by the lines connecting the constructivism paradigm to the approach, data analysis, and practice implications. From a constructivist researcher's standpoint, the research sought to assimilate others' experiences with my own to discover meaning. The data gathered were utilized to discuss identified themes and how nursing educator perspectives can inform and improve the future instructional design of debriefing and training processes. The implications on nursing practice further contribute to the advancement of online nursing education grounded both in nursing and education principles.

Figure 5

Conceptual Framework Visual Representation



Theoretical Framework

This study was a self-reported phenomenological study that used participants' experiences to capture contextual challenges. Examining participant experiences through a constructivist lens may help identify ways to improve the nurse educator experience. Examining how educators have used a constructivist approach to facilitating a VS debriefing may support recognizing areas to improve instructional design based on adult learning theories. The origins of Constructivism are derived from Jean Piaget (1967), who explained that learning is based on the idea that people actively construct or make their own knowledge determined by their own experiences and foundational knowledge (Nurkholida, 2018). Constructivism can also be viewed as a synthesis of multiple learning theories as it assimilates both behaviourist and cognitive

principles. Constructivism primarily focuses on how learners make sense of their experiences. Vygotsky (1978) further contributed to constructivism by suggesting that knowledge is more than experience and internal processes, popularizing Social Constructivism. Vygotsky (1978) explained that knowledge is socially situated and constructed through interaction with others. As the virtual simulation is conducted with the nurse educator and the group of students, both constructivism and social constructivism can be seen in debriefing as students assimilate experience and knowledge to create meaning from what happened in the scenario. Another one of constructivism's foundational theorists was John Dewey (1938), whose work proclaimed that real-world activities allow learners to exhibit higher levels of knowledge through the means of creativity and collaboration. INACSL (2021) depicts that the criteria for meeting the Healthcare Simulation SOBP Facilitation state that facilitators have a skillset related to the application of "principles of experiential, contextual, constructivist, sociocultural, and transformative educational theories as well as systems and organizational change theories" (p. 23). Constructivism is the learning theory that assists the students in assimilating the simulation experience with knowledge and therefore provides the basis for the facilitation of debriefing and this study alike. The debriefing process uses the simulation scenario as the context for reflection; the debriefing intends to support student knowledge and skill acquisition (Bryant et al., 2020; Cockerham, 2015; Jeffries, 2020). The NLN Jeffries Simulation Framework was used to discuss the foundational principles of simulation education within the context of this study (Appendix A). (Jeffries, 2016). The initial Simulation Framework provided a roadmap for describing, implementing, and evaluating simulations for nurse educators. Although this framework was established in 2005, it went through multiple iterations between 2005 and 2016 and has evolved into the National League of Nurses (NLN) NLN Jeffries Simulation Framework. The rationale

for discussing the NLN Jeffries Simulation Framework is that it establishes the critical connection between simulation design, students, educators, and debriefing. As the NLN Jeffries Simulation Framework considers all these factors, it chose it as the most appropriate one for the study. Although this study focused on virtual simulation debriefing, it sought to examine how nurse educator perspectives as formative evaluation can be used to improve the instructional design of the virtual debriefing. In addition, improved instructional design may affect the experience of nurse educators, thus demonstrating the synergistic relationship between instructional design and practice implications. The NLN Jeffries Simulation Framework was a reoccurring theme that emerged from the literature as to how prebriefing, the simulation scenario, and the debriefing are all interconnected.

In 2018, fifteen simulation specialists met at Columbia University School of Nursing for an interprofessional summit on innovations in simulation. One of the panel's recommendations suggested that all studies need a theoretical framework and, more specifically, the NLN Jeffries Simulation Framework provided a method for understanding the elements of simulation and their relationships to each other (Bryant et al., 2020; Jeffries et al., 2015). The NLN Jeffries Simulation Framework identifies essential characteristics that affect present-day virtual simulation educational practices, including fidelity, support for students, prebriefing and debriefing strategies. The NLN Jeffries Simulation Framework is very influential in simulation nursing education. It established a holistic perspective of simulation where the importance of the design, simulation scenario, debriefing and outcomes were no longer separate entities but rather interconnected areas that all contributed to high-quality simulation education (Zhu & Wu, 2016). The NLN Jeffries Simulation Framework is flexible and has been used in other disciplines such

as aviation simulation (Bryant et al., 2020). Its flexibility and adaptability contribute to its potential application to various clinical specialties and virtual simulation.

Limitations and Delimitations

Limitations are influences outside of the researcher's control that may affect any part of the research process and should be identified (Queirós et al., 2017). Acknowledgement of a study's limitations provides researchers with the opportunity to demonstrate that they have given critical consideration to the research problem and questions while understanding limitations (Queirós et al., 2017). One limitation of the study was that nurse educators leading the simulation debriefing had varying levels of experience affecting their perception of virtual debriefing barriers. Despite this, not requiring research participants to have specific experience and expertise in simulation debriefing allowed the study to capture a broad range of perspectives and to explore whether all nurse educators using simulation received the same training or support, regardless of their teaching experience.

In this study, verbatim transcription represented what each participant said. Transcriptions are text-based and exclude social and non-verbal cues such as body language or voice intonation that could provide valuable insight into a participant's experience (Azevedo, 2017). Consequently, the omission of body language and cultural barriers may affect the interviewee's articulation and expression level and its meaning in relation to the topic being discussed (Maxwell, 2012). Although transcription can exclude non-verbal cues, I, as the researcher, included appropriate follow-up prompts to encourage the maximum amount of full participation and free sharing due to relational engagement and trust-building with participants (Ozanne et al., 2017).

This study examined a single institution description of nurse educators within an Ontario university program where virtual simulation and online debriefing for year four students were used. Although all the anticipated challenges and debriefing practices may not be generalizable to all simulation educator groups, this research provided an in-depth, information-rich description of virtual debriefing practices at this institution. The study results at this single institution may be used to solve challenges in its nursing program and similar universal education challenges, such as educator support and instructional design.

Delimitations in research are characteristics that limit the scope and assist in defining the study's boundaries. For this study, invitations were sent out to 20 nurse educators, the number of potential participants who met the inclusion criteria: employed at the selected institution as Year 4 faculty members of the BScN nursing program who use the vSim for Nursing™ software. This study used a sample size of seven people. Participants had various teaching backgrounds, ages, gender, and clinical experiences. I chose to restrict the sample to one teaching institution in Ontario using the vSim for Nursing™ program to provide an in-depth understanding of nurse educators' experiences as a formative evaluation tool to reveal challenges and debriefing opportunities in a virtual simulation.

Methodology Overview

In constructivism, people's experiences are explored according to their reality and then interwoven to discover emerging patterns (Fosnot, 2013). As I aimed to examine the nurse educators' lived experiences of participating in virtual simulation debriefing, I chose a qualitative phenomenological approach as the most appropriate method to understand current debriefing practices in a virtual simulation. Purposive sampling was used to select participants from the nurse educator population. Consent for participation in the study prior to the interviews was

obtained. Each participant was interviewed through a live, online, semi-structured interview lasting 30–60 minutes per participant. The data collected from the interviews were coded and analyzed using NVivo software.

Significance

In nursing, simulation learning facilitates comprehensive and safe care to patients, necessitating continuous education for nurse educators (McAllister et al., 2013). Though the simulation experience and debriefing are crucial for meaningful learning, prime importance is given to technological tools rather than best practices that align with evidence-based pedagogy and nursing accreditation requirements (Kardong-Edgren et al., 2016). Without understanding the lived experiences of nurse educators' instructional strategy, academic programs run the risk of compromising student learning and inadequately preparing students for a competitive labour market (Cockerham, 2015). Given that the implementation of virtual simulation is new for this program, it places even greater importance on formative evaluation of practice for growth and development. The lack of virtual simulation best practice guidelines is considerable, affecting nursing research, patient care outcomes, curricular integration, knowledge acquisition, and clinical skill attainment (Jeffries, 2016). Factors affecting nurse educators in online simulation education are a lack of knowledge of student assessment, virtual debriefing techniques, evaluation, and best practice standards that apply to virtual simulation (Foronda et al., 2017). Based on my experience of educator inequity and the need for more support, from a personal standpoint, understanding how to unify educators and create more innovative and accessible training will make this study very valuable and of prime importance. Not exploring the educator's experience would be an injustice to nurse educators, students, and institutions. Exploring educator experience is vital as student outcomes are influenced by educators'

knowledge and expertise (Jang & Lee, 2017). The data gathered from this phenomenological approach could be used to create blended and distance education learning tools specific to the virtual simulation and the development of best practices.

Findings from this study focused on virtual simulation debriefing that can inform distance educators of the unique challenges and differences in distance education nursing. It is essential to recognize that in-person debriefing standards need to be examined and not directly transferred to virtual simulation so that online programs can capitalize on their unique attributes (Verkuyl et al., 2017). An examination of the practices and needs of virtual simulation debriefing shows that it supports instructional design that considers the nuances of virtual simulation such as online engagement, educational technology and navigating groups of learners with diverse needs. Findings from this study are not limited to online debriefing; in addition, the study informs in-person educational practices and debriefing design that is universally aimed at helping students connect theory to practice. For example, debriefing in-person or online is designed to facilitate the unfolding of reflection and meaningful learning that translates to practice. The use of a theoretical framework to ground debriefing questions is universally crucial for structured and conscientious planning, as recommended by the INACSL Standards Committee (2016). Although educational practices such as interaction, psychological safety, feedback, and diverse learning need to be adapted to be optimized in the online setting, these core educational practices are transferable to any debriefing format (Kim et al., 2017).

Additionally, virtual simulation is not used to replace all clinical practice, which is done in-person; thus, the development of debriefing practices may be transferable to hybrid programs that will use both formats of delivery. An examination of the experiences of virtual simulation educators allows online programs to tailor their faculty development to meet educator needs.

Improved faculty competency is transferable to in-person debriefing. It supports the current criterion of in-person debriefing by a facilitator who participates in ongoing education provided by formal courses, continuing education offerings, and or targeted work with an experienced mentor (INACSL, 2016). The facilitation of deep reflection supports students in understanding the rationale behind clinical action. A deeper understanding of practice encourages critical thinking useful for in-person debriefing and in-person nursing care that students will provide. Advocating for online educator needs supports the notion that skilled facilitators for both in-person and online debriefing are foundational for enhanced dialogical engagement for and with learners.

Summary

This first chapter discussed the background, context, and purpose of this study. The chapter outlined the research question and introduced the methodology and theoretical approach. The chapter also explained that the purpose of this proposed qualitative study was to understand nurse educators' self-reported challenges and opportunities of simulation debriefing practices at a single institution, using a formative evaluative assessment of instructional strategies.

The study's significance is to help address the gap in research regarding a nurse educators' role as a means for continuous improvement in instructional design and educator support. An educators' experience and knowledge can offer insightful information on contextual challenges and nursing simulation program sustainability. Chapter two offers a literature review about simulation in nursing, virtual simulation, simulation pedagogy, instructional design and the lack of research surrounding virtual simulation debriefing practice at the time this study was undertaken.

Chapter 2: Review of the Literature

Introduction

The nursing profession has grown exponentially in its need for students to problem-solve and think critically through complex patient care scenarios (Zuriguel-Pérez et al., 2017). In the decade before this study, there was an increased demand to achieve learning outcomes that align with continually evolving healthcare needs. This means that nurse educators need to use dynamic teaching modalities to support students (Gubrud et al., 2017). As nursing educators move away from static knowledge development, virtual simulation offers a dynamic environment that can reshape learning and interaction. Systematic reviews and meta-analyses have made it abundantly clear that simulation contributes to improved student clinical performance (Cant & Cooper, 2017; Smith et al., 2018). Though nurse educators play a pivotal role in simulation education, limited research examined debriefing in educator practice and development for virtual debriefing before this study (Verkuyl et al., 2018).

This review synthesizes the current literature surrounding simulation education, distance education, debriefing, faculty development, and instructional design as a window into the world of nursing simulation practice and its ever-changing challenges. The literature was compiled using key search phrases consisting of simulation in nursing, "NLN Jeffries Simulation Framework," "INACSL," "vSim for Nursing™," "simulation debriefing in nursing," "virtual debriefing," "virtual simulation," and "simulation outcomes measurement." The search was conducted using various databases, including CINAHL Plus, Medline, Nursing/Academic Education, Google Scholar, and ProQuest through George Brown College. The result of the search yielded 1092 sources, but articles prior to 2011 were excluded unless the work was foundational. Forty-six articles were used for this literature review.

Prior to conducting the literature review, I understood some gaps in virtual simulation, such as funding and faculty development, from my professional reality in the nursing education in which I work. I started by reviewing the source titles and abstracts to group more broad topics, such as simulation and debriefing. As I read through each topic, recurring themes began to emerge. The literature was classified into themes, including virtual simulation in nursing, reflection in debriefing, simulation education barriers and formative evaluation. This review discovered a literature gap relating to the lack of research about virtual simulation debriefing practices and an informed formative evaluation approach. Thus, the literature review provided a foundation for further research about virtual simulation as a growing entity in distance education learning.

I start this chapter by discussing the history of simulation and its role in nursing and follow it with a discussion on distance education and virtual debriefing. After this, I delineate instructor-led debriefing and why this is important, supported by a discussion on teaching and learning pedagogy. As I progressed through my simulation and virtual simulation search, the literature review process was iterative, and the NLN Jeffries Simulation Framework emerged multiple times. I began to research more about the framework by doing a second search for literature that demonstrates its application to the virtual debriefing process. This chapter discusses the nature of the problem and barriers in simulation debriefing and how the NLN Jeffries Simulation Framework may offer solutions for the virtual environment. The end of the chapter summarizes the main points of the literature review and provides my closing thoughts on the understanding of educator experience to develop simulation design specific to the virtual setting.

History of Simulation

The history of simulation learning originates from the aviation industry; simulation training has been used for half a century to train pilots and air traffic controllers with psychomotor skills and progressed to crisis management strategy (Bryant et al., 2020; Kardong-Edgren et al., 2019; Updegrove & Jafer, 2017). The most predominant use of aviation training was used to decrease aircraft accidents. The Federal Aviation Administration (FAA) began to use pilot training simulators to replace actual aircraft training. The value of simulation was reflected in the improved quality of aviation education and training, and aviation insurance companies began to require simulation training or offer lowered insurance premiums for companies that used simulator training (Updegrove & Jafer, 2017). The concept of fidelity in the simulation was introduced in aviation training by the FAA, who created the Airline Transport Pilot and Type Rating for Airplane and Helicopter Practical Test Standards that ensured that the task taught to learners needed to have specific tasks fidelity or degree of realism that the simulation requires. Stemming from the simulation roots in aviation, simulation expanded to the military, civic aviators, and the National Aeronautics and Space Administration (NASA) to train both pilots and astronauts for high-risk in-flight situations (Bryant et al., 2020). The need for safety training for high-risk, team-based, technical, and challenging situations continued to present a need for an educational modality that closed the gap between theory and practice (Bohm & Arnold, 2015).

Florence Nightingale, a pioneer in nursing, used simulation to teach procedures regarding infection control and wound care practices (Prion & Haerling, 2020). In the late 1700s, pelvic models were used to train midwives, which later evolved to the creation of the first full-body mannequin in the 1900s, commonly recognized as Resusci® Anne. This was invented by Lærdal, a Norwegian publisher and toy manufacturer (Prion & Haerling, 2020). The full-body mannequin

was used to teach CPR training, and it became the catalyst for the medical profession to use simulators to train physicians about anesthesia. One of the predicaments in simulation education at the time was, although it proved to be a useful training modality, its implementation was difficult and costly. The other challenge in simulation education was that anything other than apprenticeship-based training was not clearly defined or recognized as a necessity (Prion & Haerling, 2020). Gaba, Good, and Gravenstein made a significant impact in simulation education by developing the Comprehensive Anaesthesia Simulation Environment (CASE) and the Gainesville Anaesthesia Simulator (GAS) (Gonder et al., 2019). The development of these simulators sheds light on the significance of collaborative clinical education in realistic simulation environments.

Simultaneously, simulation as a part of education has become widely accepted as a valuable modality integrated into nursing curricula, using tools such as games, virtual reality, and low- and high-fidelity simulators (Eyikara & Baykara, 2017). In a simulation, fidelity refers to the level of realism of the simulation system: the higher the fidelity, the more the simulator is comparable to what would be experienced in real life, which is valid for many disciplines, including aviation, engineering, and nursing.

Simulation in Nursing

Simulation in nursing is an instructional strategy that enables learners to take care of patients without the risk of patient harm (Kapucu, 2017). As a teaching modality, simulation in nursing offers individual and team-based opportunities to experience scenarios that realistically place the learner in situations reflective of the clinical setting (Cook et al., 2012; Kapucu, 2017). Globally, multiple studies have found that the effective use of simulation in education improves cognitive, affective, and psychomotor outcomes in nursing students (Aghera et al., 2018; Zhang

et al., 2020). Romano et al. (2018) conducted a qualitative study at the University of Hacettepe that consisted of seven third-year nursing students who used simulation to prepare for emergency room care. At the end of the simulation, all students agreed that the simulation experience had enhanced their skills in problem-solving, decision-making and developing a professional role.

Further, Kapucu (2017) discussed a growing need to share simulation and debriefing practices across disciplines such as nursing, aviation, and engineering to increase the standardization of skills such as interprofessional communication and knowledge application in a realistic but non-threatening environment. Basak et al. (2016) conducted a study on student perception of simulation using a Satisfaction and Self-confidence Scale and Simulation Design Scale. The study results concluded that students' perceptions of simulation experiences using high-fidelity mannequins were higher in contrast to their perceptions of experiences using low-fidelity mannequins. Not only has simulation demonstrated positive student outcomes, but it has also shown positive faculty outcomes. Kim et al. (2017) conducted a study with 52 faculty members using a pre-post test to evaluate the effectiveness of an online simulation training program, examining faculty's foundational knowledge of simulation as well as perceptions and intention to adopt. The results of the study demonstrated a significant improvement in faculty knowledge after the training and observable improvements in attitudes. Therefore, online simulation training may offer an effective alternative for training larger nursing faculty groups, including adjunct faculty members.

Clinical placements in nursing require students, under supervision, to apply practical activities in the clinical setting, for example, administering medication or checking blood pressure. To acquire clinical experience, students are typically spread out throughout multiple clinical sites with different areas of expertise, meaning that some students may be able to

practice specific skills if the opportunity is presented while others may not (Foronda & Bauman, 2014). Virtual simulation education provides a unique opportunity to prepare students for the clinical setting and fill the gap between experiential learning differences among students while reducing patient risk (Bussard, 2015). Research has established that simulation-based education has multiple advantages, including immediate intervention feedback, video playback, and building on more advanced skills from previous knowledge (Bussard, 2015; Cope, 2014).

Standards of Best Practice

As the practice of simulation education began to expand, there was an increasing need for accreditation of simulation centres and standards of practice (INACSL, 2016). INACSL SOBP (2016) is the gold standard for best practice, these standards are integrated into Canadian nursing programs that use simulation learning. The (INACSL) Board of Directors adopted the Standards of Best Practice Simulation in 2011, later revised in 2013, 2016, and 2021. It is critically important to recognize the standards set out by INACSL as it provides an evidence-based framework for simulation design, implementation, debriefing, and evaluation (INACSL, 2021). Previously, the INACSL (2016) SOBP was informed by in-person simulation-based education (SBE); with the rise of VS becoming a central part of nursing curricula, the revised SOBP have started to include current evidence of virtual simulation, however, there is more research needed to have standards that are specific to the virtual setting. Specifically, this study focused on the updated SOBP criteria and required elements for the Facilitation (Appendix E) and for Professional Development (Appendix F) standards. INACSL's (2021) SOBP recognizes that facilitation methods may differ whether the simulation is conducted in real-time or whether participants interact individually within a virtual learning experience. In 2021, INACSL changed the name of SOBP to Healthcare Simulation Standards of Best Practice (HSSOBP) to engage

global and interprofessional simulation communities that are outside of nursing. INACSL (2021) has provided a Preamble (Appendix C) which explains the rationale for the updated simulation guidelines. There is still not enough research with virtual simulation for INACSL (2021) to develop definitive best practices specific to virtual simulation.

Distance Education and Nursing

The literature verifies that a critical part of nursing care, in any setting, is clinical judgement and critical thinking, which can be developed and refined in an online setting (Mohamed & IbrahimMohamed, 2018). The term distance education refers to "fully planned online and organized teaching and learning in which learners are separated from teachers or facilitators in time and space" (Bozkurt, 2019, p. 261). In comparison, blended learning is a joint design of thoughtfully selected online and in-person learning experiences to enhance educational spaces (Garrison, 2015). Distance education may also be referred to as online learning, e-learning, distributed learning, networked learning, tele-learning, virtual learning, web-based learning, and distance learning (Ally, 2004). The common denominator between these terms implies that the instructor and learners are in different places. The learner utilizes technology to access the learning materials and interact with the instructor and other learners (Ally, 2004).

Technology has become pervasive in students and educators; however, online or distance education has different challenges than traditional teaching and learning. Therefore, virtual simulation in nursing deserves to be examined as a separate online learning entity (Devaul, 2014; Sharma, 2014). In a progressively digital world, distance education has moved far beyond only catering to self-directed learning or correspondence courses (Anderson & Dron, 2011). The increased demand for distance education to meet the needs of continuing education and lifelong

learning has perpetuated the integration of online teaching modalities that use educational technology and Learning Management Systems (Simonson et al., 2019).

Nursing education requires theoretical courses and hands-on training in a clinical setting. However, the challenge is that training in the clinical setting is often anxiety-provoking for students and poses a risk for patients (Mohamed & IbrahimMohamed, 2018). For students to be placed in the clinical setting requires faculty supervision from the educational institution, meaning that accessibility to a clinical site needs to be accessible and feasible to both the nurse educator and the students (Foronda & Bauman, 2014). With advancements in distance education, virtual simulation provides the opportunity for students to have more experiential learning before caring for a patient in the clinical setting (Kim & Yoo, 2020). Distance education in nursing transcends traditional barriers of time and place through the integration of educational technology in the nursing curriculum that allows the development of technical skills and non-technical skills (Jowsey et al., 2020).

As a result of advancing technology in distance education nursing programs, students can have meaningful interactions that overcome the traditional gap between teacher, student and experiential learning without increasing risk to patients (Griffiths, 2016). In the past two decades, asynchronous education has been integrated into nursing curricula in many countries, including Canada, the United States, Australia, New Zealand and many more (Allen & Seaman, 2017). Asynchronous education allows students to interact and access course materials and attend clinical placements while still being a part of the labour force (Jowsey et al., 2020).

Du et al. (2013) explain that distance education nursing programs have increased in popularity amongst both students and educators, as they address the historical challenges of availability of clinical practice sites, flexibility and accessibility to information. Several studies

examined nursing students' perception of distance education courses. The results concluded that students felt more connected in the online learning environment and liked being able to revisit content and lessons according to their needs (Holzweiss et al., 2020; Smith & Hamilton, 2015).

A systematic review was undertaken to examine the efficacy of web-based distance education for nursing students and employed nurses (Du et al., 2013). The results of the review found that for nursing skill performance, four studies revealed a positive role for the new teaching model and that participants generally accepted web-based education with high satisfaction rates (Du et al., 2013). Distance education has become an integral part of many nursing programs; however, both distance education and nursing as a profession cannot stand still and consider the transition to an online format as complete. Healthcare needs are continually evolving, meaning that educational institutions need to stay closely tied to student and educators' changing needs.

Virtual Simulation

Lopreiato et al. (2016) recognize virtual simulation as the recreation of reality portrayed on a computer screen, allowing the learner to practice motor control and decision-making. Padilha (2019) discusses that the use of clinical virtual simulation in DE contributes to the growth of nursing competencies, improving psychomotor skills, critical thinking, and clinical decision-making (Padilha et al., 2018; Wilson-Sands et al., 2015). Distance, time, and space were traditionally barriers in education, as travelling to educational institutions to have specialized learning experiences was unlikely until simulation provided this experience with increased accessibility (Jowsey et al., 2020).

Although this study's focus was virtual simulation within the context of nursing education, numerous literature sources provided the background and context for the origin of

virtual simulation, which is the basis on which this study sits. Virtual reality is defined as "a computer-generated three-dimensional environment that gives an immersion effect" (Kardong-Edgren et al., 2016, p. 40). There is a need to translate theory into practice in many professions safely. Virtual reality and virtual simulation are valuable tools to recreate learning environments that simulate real-world learning experiences (Smith & Hamilton, 2015). Although the concept of Virtual Reality (VR) is not a new or recent technology, its integration into education is becoming more widely accepted as a teaching strategy in healthcare, engineering, aviation, and real estate (Bown et al., 2017). Virtual reality was shown to increase learner enjoyability and improve time spent on tasks (Apostolellis et al., 2018), motivation and long-term retention (Kavanagh et al., 2017). Kim et al. (2019) discussed that both VR and virtual simulation could significantly improve educational experiences through multisensory stimulation and the creation of virtual environments and systems. One of the most pivotal additions that virtual reality and virtual simulations have had in education is their ability to provide interactive functionalities that allow learners to be immersed in a three-dimensional environment (Smith & Hamilton, 2015).

Although distance education is different from blended learning, both experience similar challenges such as cognitive overload, faculty development, the interdependence of two environments, and integrating Information Communication Technology (ICT) into teaching and learning (Elmqaddem, 2019). Both virtual reality and virtual simulation share the common foundations of utilizing modern technologies. Thus, as educational modalities that can both be used in an online setting, they introduced a possible solution to the barriers of distance, time and specialized learning in distance education (Foronda & Bauman, 2014).

A two-phase mixed methods study of 57 senior nursing students was conducted to examine how virtual simulation impacted the development of clinical judgment and nursing

competencies for metacognition (Rim & Shin, 2022). Students took a two-week course then completed five virtual simulation scenarios, they completed a pre- and post-questionnaire survey, and 12 participated in the focus interview. Clinical Judgement was measured using the Lasater Clinical Judgement Rubric (2011), and nursing competency was measured using a Core-Competency Scale (Lee et al., 2017). The results demonstrated that the nursing competency scores and clinical judgment scores significantly increased after completing the virtual simulations. Notable conclusions of the focus groups were that VS stimulated intellectual curiosity and allowed for high immersion into the context of the scenario. Importantly, one of the most predominant themes in the study was scaffolding mechanisms that facilitated the learning process, including structured debriefing and an improved reflection process through repetition (Rim & Shin, 2022).

Virtual simulation offers a major advantage because the student can go back to the beginning of the simulation and revise the whole picture again, look at the assessment data, make a different choice and see the result, all without harming patients (Berman et al., 2016). Research has demonstrated that the use of virtual simulation improved student satisfaction, explicitly citing that students enjoyed having a more diverse experience and exposure to realistic circumstances that they may not have experienced in real life (Elmqaddem, 2019; Majid et al., 2017). One of the key influences of virtual simulation software in distance education is that it allows the learner to play various roles, make clinical decisions and see the different potential outcomes (Jeffries, 2020). For example, medicine and nursing students can act in simulation as the healthcare provider, conduct assessments, talk to the simulated patient, provide interventions, and respond accurately. In a study with 27 medical students comparing real-life examinations and simulation experiences, 71% of them considered the simulation setting more realistic than

the regular assessment (Kim & Yoo, 2020). Existing research has shown that VR solutions are effective at multiple levels of education and that students tend to look favourably at them (Kim & Yoo, 2020).

Simply adding virtual simulation to nursing curricula does not translate to high-quality online learning experiences; however, it requires understanding how to integrate virtual simulation into the nurse educator's practice in a way that is conducive to meaningful learning (Rourke, 2020). There are many virtual patient simulation programs suited for varying scopes of practice in healthcare. For example, Anesthesia SimSTAT™ is aimed towards Anesthesia education, while the Virtual Interactive Case system is focused on pharmacy and nursing education (Rourke, 2020). In the context of this study, the software vSim for Nursing™ was chosen as it is used by the Ontario institution being studied at and was therefore the starting point of the debriefing.

Given the need for more innovative online education that strongly considers experiential learning, educational institutions have looked to virtual simulation to bridge the gap between theory and practice (Verkuyl et al., 2018). Previously, the predominant way to provide experiential learning has been in-person in the clinical setting and in-person simulation labs. Even in distance education nursing programs, students could be placed in clinical settings closer to their residence (Aebersold, 2016). Virtual simulation is not considered a replacement for in-person clinical practice but rather a complementary tool to enhance student knowledge (Sapiano et al., 2018). Traditionally, the in-person simulation labs were only required every few months, meaning that students living at a distance could travel to school for that day; thus, the need for virtual simulation design and debriefing every week was much lower. In light of the pandemic, distance education programs' growth has increased its demand for teaching modalities using

virtual simulation; however, as this is a relatively new practice area, it requires further research (Fogg et al., 2020). It is apparent that pandemic restrictions fluctuate and cause the access to in-person clinical education to change accordingly; INACSL (2020) and the Society for Simulation in Healthcare (SSH) advocated for the use of VS as a substitute for clinical experiences during the pandemic. Moreover, the National League for Nursing (NLN) (2020) published a statement encouraging the need to integrate VS in nursing programs (Badowski & Wells-Beede, 2022). Thus, virtual simulation debriefing practices are an area that needs more attention, assessment and evaluation to inform instructional design specific for virtual simulation nurse educators (Verkuyl et al., 2017).

As suggested by Bryant et al. (2020), nursing faculty should have the opportunity to proactively explore and engage with new immersive technologies, including virtual reality, that will encourage learning in the digital age, especially as more recent technologies assist in evaluating competency. Simulation education in nursing provides students with the opportunity to care for a diverse population and patients with many disease processes before encountering these situations in the clinical environment (Rourke, 2020).

One of the key aspects of virtual simulation is that it exposes learners to scenarios that they may not have encountered previously, especially around ethical decision-making and having difficult conversations (Quick, 2021). Increasing exposure to real-life scenarios that nurses may encounter supports better preparedness and promotes transformative learning to lessen the gap from theory to practice (Gillan et al., 2021). A cross-sectional, mixed methods design used a convenience sample of 105 graduate nursing students to examine the effectiveness of virtual simulation on their ability to navigate challenging situations (Perez et al., 2022). The students were enrolled in different graduate nursing programs and completed virtual simulations, all

based on managing difficult conversations; they included communication encounters related to suicide awareness, opioid misuse management and suicide awareness. A 13 question Likert scale was used as the evaluation tool, comprised of questions regarding aspects of realism, confidence, comfort, identifying the application of knowledge, the safety of the learning environment, quality of the debriefing and usefulness; additionally, four open-ended questions were used to understand the applicability of simulation learning experience to professional practice and feelings about the experience. Perez et al. (2022) found that the majority of the participants strongly agreed that virtual simulation was effective in meeting their learning objectives, increased their confidence in dealing with a similar situation in the future, that the simulation environment was safe and particularly that the debriefing was valuable.

Consequently, virtual simulation provided students with a positive experience and increased their exposure to clinical experiences. Notably, less than half of the participants noted that they had experienced a situation in practice like in the virtual simulation scenario. Debriefing has been highly regarded as the most important aspect of simulation-based education, and as identified by the study participants, that debriefing added value to the virtual simulation, thus, to maximize the benefits of VS, facilitators of the debriefing need to have competent PD to support students in distilling the lessons from the VS (Perez et al., 2022).

The NLN Jeffries Simulation Framework

Jeffries' (2016) NLN Jeffries Simulation Framework contains central elements, including context, background, design, educational practices, simulation experience, and outcomes. The context aspect describes where the simulation occurs and explains the purpose and evaluation criteria of the learning experience. Next, the background defines the scenario's context and outlines its goals and expectations. The simulation design further narrows specific learning

objectives based on what role the learner is asked to play (Groom et al., 2014). The last aspect of the NLN Jeffries Simulation Framework is outcomes, which includes the participant, the simulated patient, and system outcomes. The NLN Jeffries Simulation Framework demonstrates the critical importance of simulation design inclusive of teacher, student and educational strategy, which affect simulation outcomes (Groom et al., 2014).

Each simulation is directly affected by the availability of technology and the expertise of the faculty. The NLN Jeffries Simulation Framework enables nurse educators to improve models of clinical education, thereby offering more pragmatic teaching strategies (Jeffries, 2016). As the level of expertise in simulation debriefing varies, the framework implies that high-quality simulation education is interconnected with the needs of the individual faculty; evidently, the NLN Jeffries Simulation Framework explains the phenomena in simulation-based education. (Jeffries, 2016). A quantitative exploratory study of 129 participants used a 30-question survey to examine how prebriefing and debriefing in VS were facilitated by nursing faculty (Badowski & Wells-Beede, 2022). The results showed that educators employed multiple strategies such as computer screen-based and three-dimensional simulation using headsets. Therefore, the wide-ranging variability in debriefing facilitation methods relates to the NLN Jeffries Simulation Framework (2016). Simulation debriefing is the focus of this study. Thus, the framework explains the phenomena of VS debriefing and holds critical answers as to how the instructional design of the debriefing is affected by educational practices and thus impacts simulation outcomes (Badowski & Wells-Beede, 2022).

Debriefing

Within the context of simulation in nursing, debriefing is the review of the simulation scenario itself and is characterized by reflective and experiential activities to encourage students

to synthesize what they thought, felt, and did during the simulation (Aghera et al., 2018; Centre for Medical Simulation, 2016). Jeffries (2016) discussed debriefing as intricately bound to simulation learning and, therefore, a priority in instructional design, planning and implementation. Forneris et al. (2015) explained that theory-based debriefing is essential for developing best practices and high-quality educational experiences. To recall, the referenced work by Jeffries (2005) and (2008) is dated; however, the author pioneered the NLN Jeffries Simulation Framework, and the literature review refers to it as seminal.

Bradley et al. (2019) explained that there is little research on training a debriefer to implement a debriefing or the best way to test that strategy's outcome. Even though the simulation community has established the significance of the knowledge and skills required to debrief learners, it is still not recognized as important as developing scenarios and using simulation equipment (Jeffries, 2016). Accordingly, there is even a further scarcity of research that compares debriefing styles and effectiveness in virtual simulation settings (Samwel, 2016).

Cresswell et al. (2020) discussed that formative evaluation could help decision-makers make proactive decisions instead of reactive ones. Formative evaluation is recognized as a method used to conduct in-process evaluations of comprehension, learning needs, and academic progress over a period of time (Granit-Dgani et al., 2016). As virtual simulation is rapidly emerging, the formative evaluation of learning can inform decision-making and address challenges that affect faculty development opportunities and resources.

Especially in newer processes, in this case, virtual simulation debriefing formative assessment can help develop appropriate metrics to establish baselines and measure progress. Srisawasdi and Panjaburee (2015) conducted a study using a multi-group pre- and post-test experimental design to assess if the simulation-based inquiry was improved with integrated

formative assessment (FE) of student learning. This 2015 study on formative assessment consisted of 120 participants. For the research, the control group received only simulation education without integrating FE. The first experimental group participated in simulation integrated with FE, and the second experimental group participated with simulation integrated with FE and involved group participation as well. The results showed that integrating formative assessment into simulation education demonstrated a better progression of scientific understanding than without FE (Srisawasdi & Panjaburee, 2015).

Consequently, the integration of formative assessment into simulation education may support the construction of a more comprehensive understanding. Given that more and more nursing programs are using virtual simulation in response to the COVID-19 pandemic, educational institutions need to learn lessons early and identify emerging unintended consequences to avoid compromising the program's quality (Cresswell et al., 2020). In-person debriefing and virtual simulation are uniquely different; the virtual landscape requires particular skills in addition to general debriefing strategies, including nursing informatics, knowledge and the how-to of applying ethical decisions (Gordon & McGonigle, 2018).

Reflection in Debriefing

Critical reflection is a fundamental aspect of debriefing for students to reconcile thoughts and actions to deduce meaning from the action. Critical reflection in simulation requires nurse educators' leadership. Although students' reflective thoughts are logical and knowledge-based, without educator guidance, such reflection can be based on one singular part of the simulation experience rather than on a holistic perspective (Luctkar-Flude et al., 2017). In turn, extrapolating one experience can cause students to apply the situation-specific interventions and feedback to all simulations and neglect important contextual issues and areas for improvement

(Johnston et al., 2019). With the guidance of a Simulation Framework, nurse educators can support discourse comprehension with students by moving beyond the tunnel vision of one experience to bigger picture thinking that discusses its translation to clinical practice. In this way, students can understand how a singular action affects multiple clinical scenarios differently so that learning is contextual and meaningful to everyone. Without a Simulation Framework and an approach to instructional design, there is less opportunity to provide strategic direction that fosters program sustainability and achieves discourse outcomes (Jefferies, 2020).

The NLN Jeffries Simulation Framework is a valuable aspect of explaining the importance and connection between prebriefing, simulation design and debriefing. The NLN Jeffries Simulation Framework and its evolution to be more inclusive illustrate that all three parts of prebriefing, simulation design and debriefing are co-dependent and beneficial to the learning process (Zhu & Wu, 2016). The NLN Jeffries Simulation Framework is useful in demonstrating that only considering one aspect of simulation, such as the design or debriefing, will significantly affect the other parts and would not create the same quality of learning outcomes such as knowledge, skills performance, learner satisfaction and critical thinking (Jeffries, 2020). By not using a Simulation Framework, nursing educators teaching in the virtual environment will lack consistency and will not meet best practice standards. Inconsistent faculty development negatively affects building rapport and trust with students as a lack of simulation design knowledge affects an educator's self-efficacy and modelling behaviours (Jefferies, 2007; Hsu et al., 2015).

Socratic questioning can be applied to simulation debriefing as it is different from only asking students what went well versus what could have gone better. Instead, it takes the approach of uncovering the answer by asking a series of questions built on previous ones (Dinkins &

Cangelosi, 2019). Though the NLN Jeffries Simulation Framework does demonstrate the connection between design and outcomes, it does not provide details of the debriefing, including a list of questions that nurse educators can ask to develop the skill of Socratic questioning. Cant and Cooper (2017) discussed "reception learning" as a critical outcome of nursing reflection. However, achieving new meaning from action is obtained by being questioned and seeking clarifications of old concepts, new concepts, and propositions. Nurse educator preparation and instructional design need to be inclusive to best foster this learning process specific to the virtual simulation environment (Poore et al., 2014). By understanding how to ask questions and prompting a student, nurse educators can encourage critical thinking and a deeper awareness of the limitations of student nurses' knowledge (Cant and Cooper, 2019).

Significance of Instructor-Led Debriefing

Reigeluth and Carr-Chellman (2009) explained that in simulation, instructors play a critical role in supporting problem-based learning and reciprocal learning through scaffolding which gradually becomes less as student performance increases. Instructors are an integrated part of the simulation. They are needed for the thoughtful manipulation of time and space to allow learners to zoom in and out of their experiences (Reigeluth & Carr-Chellman, 2009). Simulation debriefing is a critical aspect of effective instructional design that guides students in achieving learning outcomes (Decker et al., 2016). The simulation action followed by a critical reflection in the debriefing provides an opportunity to have continuity of learning between the action and reflection phases of experiential learning (Poore et al., 2014). Although the literature has established the profound effects of simulation learning on learning outcomes, there is a lack of research on the development of simulation debriefing best practices (Dreifuerst, 2012; Frandsen & Lehn-Christiansen, 2020). In several studies, the literature suggests that although students

engage in self-reflection, they grapple with understanding simulation concepts and corrective action independently without a trained facilitator to guide them (Gamboa et al., 2018; Kang & Yu, 2018; Kim & Yoo, 2020). In debriefing practice standards, the presence of a trained facilitator was identified as an essential component of the debriefing process (Decker et al., 2016).

The NLN Jeffries Simulation Framework comprises three spheres. One sphere includes the student, facilitator and educational practices; the second sphere is simulation design, which includes fidelity, problem-solving, student support, and debriefing objectives. The last sphere is outcomes: learning, skills performance, learner satisfaction, critical thinking, and self-confidence. The educational practices include active learning, feedback, interaction, collaboration, high expectations, diverse learning and time on task (Fluharty et al., 2012). Specifically, active learning, collaboration, interaction and feedback assume that the student is not a spectator in the simulation or the debriefing but rather actively engaged in the learning process. The nurse educator uses educational practices of feedback and interaction to support the student in reconciling experience and knowledge to achieve the outcomes such as skills performance and self-confidence. By utilizing education practices such as feedback and interaction from the framework based on constructivism's foundational tenets, educators help students build on prior knowledge and experience to construct new knowledge to apply to clinical practice.

As Jeffries (2016) explained, simulation outcomes are affected by the other categories of design characteristics and student, teacher, and educational practices. When looking at simulation design, debriefing is listed as a subcategory. Lack of clear instructional design for the debriefing can compromise feedback, interaction, and problem-solving, all of which are essential

to student learning. This implies that the instructional design of virtual simulation debriefing needs to evaluate preparatory and professional development for debriefing practices more carefully (Goldring et al., 2019). Jeffries (2016) also noted that educators tend to be unprepared, leading them to experiment with simulations by trial and error, making achieving learning outcomes less likely and less efficient. Unpreparedness is described as a lack of preparatory material and inadequate time for applying strategies to practice, which ultimately affects the debriefers' ability to help learners make meaningful connections (Atthill et al., 2021). Jeffries (2016) explains that unpreparedness in this context is not their fault; instead, this is due to the lack of standardized simulation best practices to prepare nurse educators appropriately.

Billings and Halstead (2015) explained that the nurse educator role utilized in simulation learning environments is different from the teacher's role in a traditional classroom or clinical setting. The difference is that teaching in a simulation setting is very student-focused; it requires faculty to facilitate learning by inspiring the student to construct knowledge and meaning. Billings and Halstead (2015) suggested that for the simulation learning environment to exist and base empirical knowledge on construct role, the educator needs to have some type of formal preparation in adult learning theory and its application to simulation.

Bissett-Johnson (2019) discussed that individual deficits are not the person's fault but rather a reflection of the complex system of hardware, software, facilities, policies, and processes surrounding that person’s functions. Thus, the simulation community must examine the systems and processes surrounding debriefing and understand how to facilitate it virtually so that learning is optimized (Kaba & Barnes, 2019).

Understanding the factors that contribute to simulation shortfalls raises the question of how to mitigate these issues of educator support. One possible mitigation approach is

recognizing that research examining simulation and debriefing strategy can play a significant role in uncovering personal knowledge or skill gaps for an opportunity for development (Sanko & Mckay, 2017). Janner (2017) suggested that identifying errors in adverse events has been observed with different individuals in different clinical and simulation environments, highlighting that an immediate solution to eradicating mistakes is focusing on the individual leading the debriefing. Daupin et al. (2016) discussed that identifying errors also demonstrated the significance of faculty development specific to the virtual simulation environment. The literature shows that nursing instructors need the proper training and educational support to facilitate comprehensive discourse conducive to building trust and reflective learning in virtual debriefing (Jeffries, 2008; Plackett et al., 2020).

Instructional Design and Formative Evaluation

Virtual simulation is an innovative teaching method rapidly growing in distance and blended nursing programs (MacRae et al., 2021). However, information regarding the educational elements that should be included in the associated instructional design, and the technology necessary for optimal implementation, is limited (Rim & Shin, 2021).

Instructional design that includes simulation learning and debriefing has been shown to effectively address the practical challenges of simulation, such as engagement and clinical reasoning development (Jeffries, 2020; Kelly & Fry, 2013). For example, Rooney et al. (2015) showed that nursing programs that methodically pre-planned for simulation to be both action and action-reflective with a well-delineated plan resulted in both students and educators having higher scores self-efficacy, confidence, and clinical skill.

Simulation debriefing as an instructional strategy supports guided reflection of the simulation scenario with the eventual goal of knowledge acquisition and skills that underpin

clinical practice (Chiniara et al., 2013). Simulation training, both in-person and virtual often replace up to fifty percent of clinical time, including Ontario. However, it offers value in terms of adjunct to clinical placements and continency planning if clinical sites are unavailable or there is a high risk of transmissible disease. The incorporation of virtual simulation training in nursing education programs has made nursing programs more flexible and able to accommodate extenuating circumstances with some level of fluidity.

Dreifuerst (2012) recognized that debriefing is significant to the actual simulation event. However, there is scarce research surrounding evidence-based strategies for successful debriefing strategies in a virtual simulation. Allen's (2012) Successive Approximation Model (SAM) allows for the accommodation of the iterative process of development where the development stage is continuous (Allen & Sites, 2012; Jung et al., 2019; Wintarti & Fardah, 2019). The SAM instructional design model has three phases: the preparation phase, the iterative design phase, and the iterative development phase. The SAM model is used as an alternative method of approaching instructional design that is appropriate for online nursing programs and simulation.

Jung et al. (2019) compared instructional design experts using different models to develop e-learning content based on SAM. The results showed that the group using the SAM model in e-learning were able to make their instruction more impactful and user-friendly than the other groups. Thus, the SAM model may be an appropriate approach to virtual simulation and debriefing in an online setting for developing best practices. First, a virtual simulation is a newer process with rapid growth; hence, the instructional design process needs to accommodate multiple evaluations and changes to illicit growth and change, which SAM can potentially support. Second, the SAM model is a collaborative process, which is necessary between

educators, policymakers, professional regulatory simulation organizations, instructional designers, and students. In this case, upper nursing management cannot make decisions removed from the nurse educator's experience; doing so may significantly affect program quality and efficiency (Czeropski & Pembrook, 2017).

It is evident that the SAM approach strongly encourages collaboration between instructional designers and the people affected by the change. Czeropski and Pembrook (2017) explained that educators and instructional designers need to not think of design approaches but instead instructional methods and solutions. Applying appropriate instructional design models for the context improves performance analysis and more efficiently pinpoints problems (Goldring et al., 2019). Rouleau et al. (2020) conducted a study to determine how virtual patient simulators could foster nursing relational skills. The study was based on qualitative evidence, theoretical approaches, adult learning theories and expert recommendations. The study aimed to contribute to the design of virtual simulation where the virtual simulated patient would respond to relational interaction. The study method utilized Merriam's (1988) approach to a qualitative study data collection using interviewing techniques such as open-ended questions and summarizing. The study concluded that narrative-type virtual patient simulation using motivational interviewing could help to realistically develop relational skills in a way that ensures simulation's adaptability and sustainability in virtual simulation (Rouleau et al., 2020). Thus, Merriam's (1988) approach to case study research can be used to gather data that may provide valuable insight for the instructional design of virtual simulation debriefing practice.

It is critically important to consider instructional design in relation to debriefing. Without carefully considered instructional design, the debriefing can become unstructured and transition to more of a discussion instead of planned moments of reflection, emotion, integration, and

assimilation of skills (Jefferies, 2020). Given the more recent integration of virtual simulation in nursing curricula, evaluating debriefing practices is even more critical for program growth and development. Cant and Cooper (2017) explained that the foundation of debriefing is experiential learning as it is intrinsically connected to reflection, noting that it is uniquely different from discussion or feedback. Debriefing is fundamentally essential to learning as it requires a two-way communication process between educators and students to assist students in adopting an approach for practice improvement (Cant & Cooper, 2017).

A quasi-experimental study of 123 senior nursing students (Ha & Song, 2015) examined the effectiveness of student-self debriefing versus instructor-led debriefing post-simulation. The data were collected and analyzed using Chi-square, t-test, and an independent t-test. The results concluded that the group with instructor-led briefing showed significantly higher scores in problem-solving, satisfaction, assessment, engaging environment, and the debriefing organization and structure. The evidence from this study suggests that nurse educators are valuable to the debriefing process. They play a vital role in facilitating simulation action into meaningful learning within the context of a healthcare profession (Ha & Song, 2015; Kang & Yu, 2018). In another study, 177 nursing students participated in an experimental study to examine debriefing methods. The study used the Clinical Experience Simulation scale, the Visual Analogue Scale, and the Debriefing Assessment for Simulation in Healthcare (DASH) to score student satisfaction. The results showed that the total score was significantly higher when simulation combined group and instructor-led debriefing when compared with peer debriefing (Rueda-Medina et al., 2021). For instructor-led debriefing to be high quality, the instructor needs expert training (Rueda-Medina et al., 2021). Therefore, instructor-led debriefing in the virtual

simulation environment is valuable to enhance debriefing satisfaction and justifies the exploration of nurse educator experiences for this study.

Kelly and Fry (2013) conducted a study that required master's nursing students to demonstrate teaching a skill to others using the simulation mannequin and complete a survey evaluating the experience. According to Kelly and Fry (2013), the grading criteria included knowledge acquisition, professionalism, and medical language. Their study revealed that students liked the assignment and described increased confidence in their role development as nurse educators. It was apparent that simulation education is an effective teaching strategy that supports that effective student learning is connected to effective instruction, which implies the need for development. Part of a nurse educator's task is to develop evidence-based instruction skills in simulation, including integrating theory and practice into debriefing (WHO, 2016). Developing simulation pedagogy for nurse educators is a complex process that involves evaluating the educator's present day-level of debriefing knowledge to identify learning needs to achieve innovative change to the process (Hsu et al., 2015).

Debriefing for Meaningful Learning

Debriefing post-simulation often has inconsistencies in methods, application, and outcomes (Dreifuerst, 2012). Brydges et al. (2012) suggested that simulation educator training needs to include advanced thinking about how right and wrong interventions influence practice and complex patient outcomes. As a possible solution to understanding simulation outcomes, Dreifuerst (2012) created the Debriefing for Meaningful Learning (DML) theory that could be applied to simulation debriefing conversations to support the transfer of knowledge and skills to the clinical settings (Dreifuerst, 2012; Hayden et al., 2014). DML is rooted in critical reflection and can be adapted to specific simulation scenarios based on experiences students have, thus

improving the debriefing meaningfulness. The DML framework training provides debriefing questions and strategies that implement a nonjudgmental environment to discuss the events in clinical practice critically. Critical reflection in debriefing should drive nursing action, making it a predecessor to meaningful learning that can transform one's practice.

As simulation practice evolved, virtual simulation emerged, and the DML was adapted to the Simulation Effectiveness Tool - Modified (SET-M) (Leighton et al., 2015). The SET-M evaluation tool was modified by INACSL SOBP (2016) and the American Association of Colleges of Nursing baccalaureate essentials language (Hunt & Yordy, 2020). SET-M is designed to capture elements of simulation in the virtual setting, including active verbs and current terminology such as prebriefing and debriefing (Leighton et al., 2015). Although the SET-M evaluation tool was created in alignment with the American Association of College of Nursing, it was also developed in collaboration with INACL's SOBP (2016) which is used in Canadian nursing education. INACSL SOBP (2016) recognized the need to update the DML framework used in debriefing to include aspects of the virtual setting; it demonstrates the importance of differentiating best practices in debriefing from best practices of debriefing in the virtual environment. In addition, INACSL's SOBP is foundational to standardizing language, behaviours, and curricular design for facilitators (Sittner et al., 2015). Thus, this study may contribute to the collection of literature that INACSL SOBP can use to develop best practice standards specifically for virtual simulation debriefing.

Teaching and Learning Pedagogy

Pedagogy for simulation must be relevant and aligned with current best practices to challenge conventional or outdated content that neglects the human experience, namely meaningful debriefing (Murphy et al., 2011). Simulation learning, which has been used for years,

has not evolved alongside pedagogy and technology simulation education (Hopwood, 2017). As the needs of the healthcare field change, simulation pedagogy needs to undergo an evolution in design and implementation to be relevant and innovative in the virtual setting (Roh et al., 2016). There is a need for simulation pedagogy to extend past its traditional competence-driven outcomes to better understand educator experiences and needs. Simulation pedagogy development should meet the educators' diverse needs to meet students' various needs (Cant & Cooper, 2017). It is a synergistic relationship that does not develop without affecting others (Jeffries, 2020). As nurse educators' needs vary from novice to intermediate to senior levels, pedagogy must inform the formative evaluation process to accommodate a vast range of needs in its design (Jeffries, 2020). With the ever-changing healthcare system, virtual simulation settings and educational technology advances demand supportive pedagogy that adapts to advanced, high-level debriefing methods and evaluation (Cant & Cooper, 2017). Knowledge construction is a significant outcome for student learning, ultimately connected to educator training (Cant & Cooper, 2011).

Effective simulation activities need to have a theoretical basis underlying their educational processes (Foronda et al., 2017). Applying the same pedagogy across other courses as a one-size-fits-all does not work. There is a lack of formal virtual simulation education underpinned by pedagogy appropriate for this setting (Padilha et al., 2018). It is assumed that clinical and teaching experience are equivalent and are transferrable to the simulation environment. Assuming that nursing experience is generic contributes to another major issue: the lack of recognition and advocacy for simulation educators and the need for a pedagogy applicable to simulation and virtual simulation education (Foronda et al., 2017). Cropp et al.

(2018) depicted that simulation advocacy teams have proven effective for leadership and formative evaluation practice in debriefing.

An example of this is the Bay Area Simulation Collaborative (2016), which involved over 100 schools and hospitals and 600 faculty educators engaged in a two-year project specifically designed to train and educate nursing faculty about simulation. In addition to developing simulation scenarios, the group guidelines were research-driven and used formative evaluation for instructional design and measuring student outcomes (Thurston, 2019).

Simulation Education Barriers

As the use of high-fidelity simulation (HFS) as an instructional strategy increases, educators will likely need faculty development opportunities on how to teach specifically to virtual simulation (Shin et al., 2019). Identifying barriers to virtual simulation education is essential for understanding how the virtual environment presents new challenges and needs. Foronda et al. (2020) conducted a systematic review on the use of VS; evidently, the data showed that VS led to statistically significant improvements in outcomes when compared with traditional methods. However, VS's wide-ranging context and modalities make it difficult to approach best practices (Foronda et al., 2020). The virtual simulation barriers include designing and teaching ethics, funding, faculty development, use of ICT, simulation pedagogy and standardization of practice. Understanding challenges in VS debriefing is necessary to create innovative change and implement the new INACSL (2021) best practices to understand its implications on instructional design and program outcomes. Obstacles such as funding, accessibility and faculty development are not limited to virtual simulation but exist as challenges in education overall (Haukedal et al., 2018). Shin et al. (2019) explain that the improvement in virtual simulation's educational effects is not achieved only by seeing it as a separate entity. It is

achieved by integrating virtual and general simulation strategies for learner engagement. Therefore, this study contributes to the body of literature that supports solving longstanding evolving challenges in nursing education and education as a whole.

In this study, the barriers listed are interconnected to the lack of research in virtual simulation altogether. Poor recognition of virtual simulation as a different entity than simulation education contributes to a lack of funding allotted to faculty development (Erlam et al., 2017). If it is assumed that the current simulation practices are the same in an online setting, there is little need for additional training. Less funding allocation for faculty development further emphasizes the fragmentation and inequity between full-time and part-time support (Woodworth, 2017). Without resources to support faculty development, transition, and education on using ICT, it becomes a barrier to high-quality virtual simulation programs. Finally, without simulation pedagogy, the program's instructional design will not be responsive to the educators' and learners' needs (Haukedal et al., 2018). Part of the complex barriers in virtual simulation is that simulation is not pedagogy but an immersive teaching/learning platform representing a functioning system (Erlam et al., 2017). Erlam et al. (2017) explained that simulation as a teaching/learning platform is optimized when instructional design incorporates the inspiration of behaviourism, cognitivism, and constructivism.

A qualitative study with 25 nursing faculty members from baccalaureate and associate degree nursing programs examined what educators perceived to be barriers in teaching simulation. The faculty completed an online survey with questions about obstacles to using simulation in teaching. The researchers then used content analysis that revealed that lack of training, lack of space and equipment/scheduling the lab, lack of funding, staffing, and student engagement were perceived as barriers for simulation learning (Guimond et al., 2011).

Ethics

A qualitative exploratory study was conducted to assess nurse debriefing simulation perceptions by Santiago and Abdool (2011). The nurses in that study perceived concerns regarding moral dilemmas, and they felt that they were ill-equipped to tend to the psychological needs of patient care on a simulator. The study highlights the importance of comprehensive and specialized faculty development that addresses integrating ethical knowing into simulation practice and debriefing (Santiago & Abdool, 2011). Ethical consideration and developing emotional intelligence are complicated factors often missed in the simulation and during the debriefing (Buxton et al., 2015). Not incorporating ethical considerations and emotionally taxing situations can cause students to be more likely to breach confidentiality and ethical boundaries in clinical practice (Santiago & Abdool, 2011). Ethical decision-making is a critical aspect of the nursing curricula: nurses must understand how to safely and appropriately implement crisis management to approach morally challenging dilemmas respectfully. In contrast, if ethical considerations are not discussed in simulation, it may translate to the clinical setting. Therefore, this study examined whether simulation debriefing may be a potential solution to this ethical shortfall, permitting students to act in a professional capacity in a realistic patient-care scenario with the negligible threat of harm to others or themselves.

Lack of Debriefing Standards in Virtual Simulation

INACSL SOBP (2016) describes debriefing as a vital part of the simulation experience. It enhances learning, self-awareness, and clinical reasoning in which there are various approaches in the literature (Decker et al., 2016, Simon et al., 2010). INACSL SOBP (2016) explained that best practices for debriefing require an educator who is trained and competent in debriefing and possesses the intention to facilitate the debrief, thereby producing an environment that promotes

learning with a debriefing framework that aligns with simulation outcomes. As virtual simulation is a growing new field, it is unclear whether best practices for general debriefing can be applied to VS in the same way. A large part of this uncertainty is the lack of empirical literature examining debriefing in this context.

It is evident that the field of virtual reality and simulation technology is rapidly evolving, meaning that it is essential to not merely assume that general debriefing models and standards apply to virtual simulation. Generalizing simulation standards to be the same as virtual debriefing practice may limit both students' and educators' possibilities (Shin et al., 2019). With virtual simulation debriefing practices being underexplored, it does not align with the growth and efficient development that simulation technology undergoes. Thus, it creates a disconnect in developing virtual simulation best practices and its integration into distance education (Verkuyl et al., 2017). To replicate the status quo of debriefing in virtual simulation slows an educational institution’s ability to shift gears to capitalize on the unique attributes of virtual simulation that may confront historical challenges of education such as faculty support, accessibility, and equity. Without recognizing how individual experience and reflection can inform instructional design in ways that in-person debrief cannot, it underutilizes the potential possibilities of technological advances and analytics in virtual simulation (Gordon, 2017).

Funding

Nursing programs have limited resources to devote to ongoing simulation program development. In addition to limited finances, a growing apprehension is that many programs will allocate resources to equipment for simulation scenarios without a plan for ongoing faculty development and financial support for expansion that keeps the program relevant in a digital world (Roussin & Weinstock, 2017).

The World Health Organization (WHO, 2020) estimated that there would be a global shortage of 18 million healthcare workers by 2030. Hence, there is a considerable need for nursing education to reconsider factors that affect new nurses' development, retention of faculty and continuous education of nurses. Part-time faculty do not receive equivalent education funding to full-time faculty for professional development courses that further develop specialty areas. Haddad et al. (2020) stated that across North America, over 50% of the total nursing faculty is employed part-time. This percentage will increase as adjunct faculty often teach in multiple places due to a lack of job security and training opportunities (Beroz et al., 2020). This implies that if part-time faculty receive insufficient supported education, more simulations can lead to less qualified instructors in a virtual simulation. Boamah et al. (2021) explained that faculty development requires equitable distribution of resources across faculty and realistic and equitable adjustments to encourage teamwork. Without consistent and standardized training for educators who teach in virtual simulation, there is no formal approach that assesses experience and needs to inform instructional design and orientation for educators (Joo et al., 2015). One of the contributing factors in training inconsistencies is the prevalence of part-time and casual staff, who often fill in for full-time simulation educators, assuming that no additional skills or expertise is needed to conduct the debriefing. Inconsistent training makes it exceptionally challenging to integrate new simulation methods, making the quality of simulations challenging to control, and high numbers make accountability difficult (Guimond, Sole, & Salas, 2011).

Information Communication Technology (ICT)

Bryant et al. (2020) emphasized that simulation-based education aims not to introduce the latest technology into training but to develop practice-ready professionals. Educators can use the technology to be more efficient and, therefore, more meaningful to each learner with improved

understanding and training on ICT used in debriefing. Arthur et al. (2011) conducted a cross-sectional survey of 24 nursing students from multiple schools to explore the use of simulation and information communication technologies in simulation pedagogy. The results showed substantial inconsistencies in simulation expertise and ICT teaching resources (Arthur et al., 2011). The study suggested that more funding and comprehensive training opportunities will support technology's quality use.

Furthermore, as Foronda et al. (2017) explained, virtual debriefing practice is often not something that nurse educators typically utilize during the majority of their careers, which makes training challenging. Using virtual simulation as a modality requires initial and continuous funding and resources to support a rising new practice that will continue to change. A lack of funding for both educational training and ICT use poses a great predicament to faculty development as virtual simulation utilizes new educational technology that requires instruction on its use in an online environment. As a potential consideration, Bryant et al. (2020) suggested that simulation education studies could potentially be connected to more substantial funding streams such as partnerships with augmented reality companies, whose technology may be the future of simulation.

Interdisciplinary Training

One cannot merely interchange nurse educators from one specialty to another. Specialties in nursing refer to expertise in different clinical areas such as surgery, internal medicine or oncology. To specialize in specific clinical areas requires more advanced and specific training to provide care to patients safely. Just as nurse educators are diverse, simulation nurse educators must be recognized and provided with specialized virtual simulation training and skills (Gordon & McGonigle, 2018). Foronda et al. (2020) conducted a systematic review to synthesize nursing

simulation education research in virtual and non-virtual simulation; the research concluded that 80 studies across nursing reported that simulation improved student learning outcomes, skill performance, learner satisfaction and self-confidence.

There is a need to develop best practices for virtual simulation and the potential for collaboration between regulatory bodies, simulation experts, and nursing schools to build evidence-based and well-informed guidelines. However, evidence-based building guidelines require a more robust collection of studies that specifically focus on virtual simulation.

Summary

This review discussed literature about simulation, design and debriefing and debriefing in the virtual setting to uncover recurring themes. By examining the history of simulation and its influence on instructional design and student outcomes, I explored how virtual simulation is critical in developing new learning modalities in nursing education. I reviewed research that established that debriefing with instructors was the most crucial factor contributing to reflective and meaningful learning. I acknowledged that research is abundant concerning simulation itself. Though debriefing was critical, research from an educator's perspective in virtual simulation practice is scarce and contributes to the lack of best practice development. The literature review provided an examination of information to enhance understanding of the complexities of virtual simulation education and barriers such as ICT use and funding. Only when we identify a problem can we start to change our deeply embedded practices and ways of thinking. This review has shed light on a research gap that deserves more consideration of current critical issues in virtual simulation practice. The findings from the review demonstrated that for students to reflect on simulation for meaningful learning and improvement of practice, educator experiences add value to inform instructional design activities that attend to contextual challenges such as ICT

integration. Multiple studies identified that debriefing and the debriefer played a critical role in student learning. However, training and development of the virtual setting's debriefer were often not included in the literature (Klenke-Borgmann et al., 2021). As virtual simulation technology continues to develop, there is a need for empirical research to strengthen educator development, simulation design, and debriefing for optimal learning outcomes. By gathering relevant debriefing practice data, this study identified contextual challenges that educators faced in this relatively new virtual simulation area and suggested innovative changes that align with the healthcare sector's needs.

Chapter 3: Theoretical Framework

Positioning

Constructivism purports that people construct their understanding and knowledge of the world by reconciling prior knowledge, experiences, and new knowledge congruent with their epistemology (Dennick, 2016). One of the central underpinnings of simulation learning is experiential learning and constructivism in debriefing. Students can achieve these constructivist premises by sharing their experiences with others, and teachers are responsible for facilitating an active dialogue to encourage knowledge development (Coutinho et al., 2016). I selected a phenomenological approach to explore participants' experience as a basis for knowledge construction and contribution to addressing contextual challenges in virtual simulation education. I hypothesized that the perspectives of people who facilitate virtual debriefing after simulation could provide valuable insight, both from an instructional capacity and as learners. As virtual simulation practice emerges alongside society's evolving healthcare needs, educators will need to learn new strategies and simulation technologies to integrate into their teaching practice in an online setting. Accordingly, the nurse educator's experience and perceptions will also progress over time. This is why I believe that the debriefer's experiences should be assessed over time to ensure that virtual simulation programs address the ever-changing contextual challenges and opportunities to grow as a part of iterative instructional design. As educators are continually required to understand new information and reconcile it with previous knowledge to facilitate meaningful debriefing, constructivism serves as a foundation in this study to understand how educators assimilate knowledge and experiences into praxis. In this instance, the nurse educator's praxis is the virtual debriefing where students in the simulation reflect on that experience to translate their learning to practice. As a constructivist researcher, I took a subjective approach in

which the study findings were created through my interaction with participants. My constructivist paradigm is a postpositivist paradigm, which suggests that the researcher must interact with the study participants throughout the research process to access the various perceptions of reality that may exist (Appleton & King, 1997). To best support my constructivist paradigm, I chose hermeneutic phenomenology, which uses the art of interpretation to understand the significance of human action beyond a descriptive level (Appleton & King, 1997).

Constructivism as a guiding framework was chosen for this study as it purports that the learner utilizes previous knowledge to construct new knowledge, and reflection supports the transition between the two (Barton et al., 2018; Bruner; 1990; Piaget, 1971). Constructivism's underlying assumption recognizes that learners already know, which is identified as the pre-existing knowledge. One of the first origins of reflection in learning was recognized by John Dewey (1938), who described it as "the active, persistent and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further consideration to which it tends" (Dewey, 1933, p. 9). Kolb (1984) further expanded the concept of reflection, explaining that reflection is the ability to engage in the learning process by moving through steps from the concrete experience to sense-making through reflection. Other theorists such as Bruner (1990) contributed foundational aspects that furthered constructivism development, which is seen in current virtual simulation design. For example, Bruner (1990) explained that instruction should be concerned with context and experience contributing to readiness and willingness to learn, which is emulated in pre-briefing before simulation.

Instruction must be structured to be easily grasped by the student (spiral organization) (Bruner, 1990). In constructivism, reflection supports the learner to filter through the experience

and pre-existing concepts to create new knowledge (Doolittle, 2014; Piaget 1971. Constructivism and reflective practice share basic assumptions about knowledge and learning. Both suggest that ideas and action are integral, interdependent, and critical aspects of the learning process (Piaget 1971; Dewey; 1933). Dewy (1933), as cited in Doolittle (2014), explained that learning is not a response phenomenon but a complex self-regulation process that struggles with personal conceptual structures and creates new ones through reflection and abstraction. Reflective practice and constructivism paradigms assume that learning begins with a personal aspiration to learn, and it is the educator's initial responsibility to stimulate the learner's interest (Doolittle, 2014; Piaget, 1971).

Constructivism and reflective practice emphasize the importance of conceptual conflict, a "perturbation," or problem as a learning stimulus. Therefore, new knowledge is interpreted by existing knowledge and experience; in this case, the experience is the simulation. In particular, reflection, self-assessment, and clinical reasoning development are essential approaches to learning informed by constructivism (Mann & MacLeod, 2014). Reflection for the development of learning and clinical reasoning are critically important competencies for healthcare professionals to provide safe care for patients.

According to Dreifuerst (2012), knowledge acquisition from meaningfulness builds personal knowledge by merging personal experience. Personal knowledge development includes environmental interaction with instructors, comprehension, and individual judgment, positively affecting clinical, personal, ethical, and aesthetic knowledge used in debriefing (Norman, 2012). The use of constructivism is not only for student learning; it can be used to educate the educator to support instructors in having a meaningful experience during training and orientation activities. Nurse educators already have pre-existing knowledge about teaching; however, more

training and support are needed to allow educators to apply educational practices in the virtual settings for debriefing. Therefore, as constructivism assumes the learner has pre-existing knowledge, it may also be helpful to further the faculty's development of knowledge, skills and judgements needed to facilitate virtual debriefing (Bada & Olusegun, 2015). Approaching instructional training with a constructivist paradigm provides the opportunity for meaningful learning to start with the educator and translate to students through the teaching approach as one understands the value it adds to practice (Breymier et al., 2015). Studying virtual simulation debriefing practice may provide an opportunity to meet a more extensive range of educator needs by understanding their experience to fuel innovative solutions that can unify distance educators while developing best practices. Reflection in the context of virtual simulation requires students to think back about their foundational nursing knowledge in combination with the virtual experience to create meaning, which is why constructivism is imperative for transformational learning. von Glasersfeld (1990) is acknowledged as the primary exponent of trivial constructivism. von Glasersfeld explained that trivial constructivism emphasizes the external world from this perspective; the learner constructs knowledge from one's experiences as a means to impose order and make sense of those experiences. von Glasersfeld (2005) played a pivotal role in constructivism to support the ideology that the educator's role is not to dispense knowledge but to provide students with incentives and opportunities to build it up. The concept of trivial constructivism is foundational to nursing as the simulation scenario is external to the student and trivial constructivism supports learners to reconcile the simulation experience with procedural order and meaning that translates to future clinical practice. As Doolittle (2014) discussed, knowledge is the internalization of one's external reality, and consequently, the learner builds internal models of the real world (Piaget 1971; Dewy 1933). As students have

external experiences such as the interventions they applied in the scenario and the debriefing, nurse educators become part of that external world. Thus, an instructor's role is to support the understanding of the external simulation experience to contribute to building the student's inner world through meaningful learning.

Transformational and meaningful learning has the power to create behaviour and attitudinal change for practice improvement (Liaw et al., 2018). Due to the lack of physicality in a virtual simulation, it is even more critical for nurse educators to learn appropriate debriefing strategies that foster growth and meaning in an online setting.

Constructivism and Cognitivism

There are many learning theories that can be used to explain the process of learning and interaction. Although my approach to this study uses a constructivist approach, I also discuss instructional design grounded in cognitivism. Therefore, it is crucial to describe the connection between constructivism and cognitive theory while distinguishing between the two. As discussed, constructivism describes integrating knowledge and experience for meaningful learning (Piaget, 1972). The emergence of cognitive learning perspectives shifted attention away from the behaviour and observable changes in learning to more complex processes such as problem-solving (Tawfik et al., 2020). Cognitive theories concentrate on conceptualizing a students' learning processes to understand how information is organized, stored, and accessed by the mind. Cognitivism has played an instrumental role in instructional design. Cognitivism suggests that high-quality instructional design requires more than teaching materials and technology. Instructional design considers how students process and interact with active engagement instead of passivity (Clark, 2018). In instructional design, learning is a process of "gathering together relevant pieces of information together until they begin to form a complete

picture" (Bates, 2016, p. 39). In this study, I examine nursing educator experiences as relevant information that fits into an overall virtual simulation design and formative evaluation. An important factor that both constructivism and cognitivism share is that student learning is affected by the environment (Clark, 2018).

In this case, the virtual simulation is the environment, and the nurse educator affects that environment by setting the scene for learning and providing psychological safety. At the same time there is a connection to the underlying assumptions that cognitivism and constructivism share, constructivism is uniquely different from cognitivism. Cognitivism's approach is that the world is external to the learner, meaning that the instructional goal is to map that same external world onto the learner as opposed to having the learner create meaning (Ertmer & Newby, 2017). Although virtual simulation seeks to recreate realistic representations of a nurse's external world, it is distinctly different from imposing predetermined meaning for their actions. In simulation learning, the simulation experience combined with previous knowledge is used in debriefing to create meaning for learners, not dictate how they should understand the world. Thus, I chose constructivism as the most appropriate theoretical framework.

The exploration and interpretation of knowledge are reflected in my choice of the research paradigm of constructivism. My paradigm choice illustrates the importance of human inquiry as a valuable tool that can create virtual simulation practice that seeks knowledge as it emerges in context instead of transferring it from the educator to the student. As Reigeluth (2013) discussed, learning needs to be contextual and relevant for the learner. Constructivism as a theoretical framework suggests that behaviour is situationally determined, particularly important to virtual simulation as students will choose their nursing interventions and behavioural interaction based on the simulated scenario. As students are exposed to virtual

simulated scenarios with varying contexts, their actions and reflection have an opportunity to deepen and become more complex through reflection. Mainly, constructivism builds on foundational knowledge, which is critical to the nursing practice as more advanced skills require the foundation of previous nursing knowledge to act in more acute simulations.

The simulated environment is presented to the student, and meaning is derived from reflection and understanding, not memorization (Eyikara & Baykara, 2017). Specific to nursing as a profession, prioritizing interventions and experiencing patient outcomes is fundamental. Clinical practice consists of many diverse changing contexts where the nurse will need to adapt to challenges based on that scenario. The goal of instruction is not to ensure that individuals know particular facts but rather that they elaborate on and interpret information in a way that is appropriate for that situation. "Understanding is developed through continued, situated use … and does not crystallize into a categorical definition" (Bown et al., 2017, p. 33). A concept will continue to develop with a new use as new circumstances, negotiations, and activities reorganize it differently. Therefore, constructivism in virtual simulation debriefing suggests that meaning is not a part of fixed memory that the learner can retrieve (Smith & Hamilton, 2015). Instead, learning based on experience, context and meaning are continuously under construction as a cumulative account of interaction that changes depending on the unique problem at hand.

My choice of a qualitative research design allows for the exploration of human experience to construct knowledge that informs the discipline of virtual simulation nursing education and possibly provides the basis to develop innovative online platforms that will integrate robust training and best practice for nurse educators who use simulations. The constructivist paradigm is humanistic and anti-positivist, aligning with my deep consideration of

human experience and social reality, reflected in this qualitative study's design (Cleland & Durning, 2015; Piaget, 1972; Vygotsky, 1978).

Chapter 4: Methodology

Simulation education has revolutionized nursing curricula by integrating theoretical knowledge into practice, and as of more recently, virtual simulation continues to transform the trajectory of nursing education. This chapter outlines how my interpretive paradigm has influenced my choice of phenomenology as the methodology for exploring nurse educators' experiences in virtual simulation debriefing. This chapter discusses the method for answering my research question: *What are the experiences of nurse educators who facilitate virtual simulation debriefing sessions?* I also discuss pertinent ethical considerations and academic rigour. The chapter begins with the foundations of qualitative research and phenomenology. It is crucial to understand that phenomenology aims to examine fundamental human truths relevant to my study and best facilitated through a phenomenological approach. Discussing phenomenology demonstrates a connection to my constructivist/ interpretivist paradigm, specifically hermeneutic phenomenology, which involves reflecting on experience while employing interpretive language and lived meaning analysis (van Manen, 2016). The chapter examines my ontological and epistemological positioning. The detailed aspects of the methodology—justification of the choice of phenomenology, data collection and analysis—are explained. Given that this study was a qualitative study conducted at an institution in which I work, the tenet of bias is addressed through trustworthiness, credibility, and reflexivity, which is discussed under ethical considerations.

Simulation in nursing is followed by a debriefing to encourage students to reflect on what occurred during the simulation scenario to develop knowledge, skills, and principles. As previously discussed, virtual simulation debriefing is a critical facet of the simulation process that significantly affects learning outcomes such as improved self-awareness, competency, and

knowledge limitations (Gordon, 2017). Formative evaluation is the continuous, flexible, and diagnostic approach that can help shape instructional design and an educational program's future. For this study, the qualitative design is intended to contribute to the formative evaluation of current virtual debriefing practices to inform and improve instructional design and educator support (Lee et al., 2017).

As a phenomenological researcher, I was interested in how each participant teaching in Year 4 of a nursing program experienced virtual simulation debriefing and their perception of their experience. To fully engage in the concept of hermeneutic phenomenology, I kept a research journal to record my interpretations throughout the data collection and analysis; doing so supported reflexivity and the co-construction of meaning. The sample population consisted of Year 4 educators, who are also a part of my professional reality and lifeworld. Heidegger's (1927) philosophy depicts that an individual cannot step out of one's lifeworld; humans cannot experience a phenomenon without referring to their background understandings (Heidegger, 1927). To best capture the human experiences of the participants, I chose to code the data by taking a systematic latent approach to shed light on implied inferences that add value to the phenomena. All seven participant transcripts were coded by sentence, and each sentence was considered one coded unit. Themes were created based on what emerged from the data, and a portion was co-coded as a part of the study's rigour. Each theme consisted of subthemes, which are described under the parent codes. I wrote a reflection after each interview, and after each essential theme emerged, I did that so those themes would float on top of the data as a means to support my introspection and reflection. Engaging in the cycle of iterative reflection and looping back allowed me to think about participants' experiences and my own experiences for the co-construction of knowledge. After the findings were completed, I revised all the transcripts

multiple times to ensure that the themes identified were true for each participant and that I had not overlooked any essential themes.

Research Sub-Questions

1. What are the prerequisites, training processes, and materials required for a nurse educator prior to facilitating virtual simulation debriefing?
2. How do debriefing strategies in the virtual environment compare to in-person debriefing to achieve the intended learning objectives?
3. How can virtual simulation debriefing practices be improved and contribute to best practices?

Qualitative Data

A qualitative research approach is predominantly used in social sciences to examine thoughts, feelings, and social interactions daily to recognize patterns and meaning (Taylor et al., 2015). This study aims to understand the why and how of nurse educators' experience in leading virtual simulation debriefing sessions. A quantitative approach would neither capture the detailed description of the phenomenon of the experience nor answer the research question (Taylor et al., 2015).

Phenomenology

The study of phenomenology is based on the principle that fundamental human truths are accessible only through subjectivity (Sloan & Bowe, 2014). As a researcher, I decided that phenomenology is the most suitable method for understanding nurse educators' lived experiences who facilitate post-simulation debriefing. In addition, phenomenology is a credible and valuable means to research knowledge (Jones & Borbasi, 2012). Although there are various subtypes of phenomenology, such as descriptive (transcendental constitutive), hermeneutic (interpretive),

and realistic phenomenology, for this study, I have focused on van Manen's (2016) hermeneutic (interpretive) phenomenology. van Manen (2016) stated that hermeneutic phenomenology is based on experience and reflection through the interpretation and analysis of lived meaning. The phenomenological approach is particularly suited to research in nursing because daily clinical practice requires reflective and introspective thinking.

Phenomenology provides insight into lived experience or the lifeworld as a means to re-examine experiences for lost or unnoticed meaning. van Manen (2016) discussed that life-world experiences are often pre-reflective ones and without conceptualization, making it easy to take them for granted. Transcendental or Husserlian phenomenology, and hermeneutic or Heideggerian phenomenology, have noteworthy philosophical differences reflected in their associated methods, data collection, and analysis (Laverty, 2003).

The initial development of the discipline of phenomenology is credited to Husserl (1980), who had previously studied mathematics and then transitioned away from empirical scientific investigations to recover what seemed to be lost in human experience (Laverty, 2003). Philosophically, Husserlian phenomenology is based on the ontological view that reality is internal to the knower; the philosophy stemmed from the epistemological question of how we know what we know, which produces a more mechanical view of the person (Laverty, 2003). Husserl (1980) described an experience as something apart from oneself and recognized duality between the mind-body split. Key identifying methods used in Husserlian phenomenology include intentionality and bracketing to suspend one's judgment, which is influenced by a more objective standpoint that traces back to the initial philosophy. The initial philosophy is evident in the data collection and analysis in which the researcher identifies units of meaning and clusters them into themes to form textual descriptions (Suddick, 2020).

In contrast, Heidegger (1988) coined the term hermeneutic phenomenology, which is philosophically underpinned by the ontological belief in the multiplicity of reality, which is discovered through understanding what it means to be a person situated in the world. Hermeneutic phenomenology not only goes beyond the description of an experience; it recognizes that pre-understanding and accumulation of historically lived experiences affect meaning. There is an emphasis on reading and writing as a part of reflexivity since interpretations evolved from a pre-understanding. My understanding of the phenomena suggested that hermeneutic phenomenology best facilitated the co-construction of meaning. My pre-understanding of a constructivist research paradigm was considered my prior knowledge and experience, which supported building meaning in combination with the participant perspectives. Hermeneutic phenomenology acknowledges that my pre-understanding as a researcher is a part of my historicity. I was not stepping outside of my account of experience but rather using it as a point of reference for interpretation. Hermeneutic phenomenology in this study acknowledges the starting point to be the researcher seeking to understand something in which one has a connection to the subject matter. Furthermore, to be able to re-examine nurse educator experiences for interpretation and meaning, hermeneutic phenomenology informed the choice of semi-structured interviews to collect data and achieve trustworthiness. The raw data from the interviews were audio recorded in order to be transcribed verbatim into text. Transcribed interviews were conducive to allowing the researcher to understand the lived experience and move between specific parts of the transcribed texts and then the whole text to integrate the participants, researcher, and context.

Hermeneutic phenomenology requires strict rigour to achieve trustworthiness; it ensures that the interpretation is embedded throughout the research process and is understood by the

researcher and outside readers to demonstrate the complexity of the experience and transparency in the research. The data analysis is an iterative cycle that captures reflections towards a robust and nuanced analysis. Contrarily, as Husserlian phenomenology considers how we know what we know, its data collection methods claim that procedures guarantee the validity of interpretation.

For Husserlian phenomenology, reflection is used to increase awareness of one's assumptions and bracket them as a safeguard from inflicting biases of the researcher on the study. In contrast, hermeneutic phenomenology utilizes reflection and reflexivity at the beginning and throughout the research to support the co-construction of knowledge that allows patterns to emerge from the text.

In particular to this study, as a constructivist researcher, the interpretive process was critically important to understanding how collective historical meanings affect nurse educators individually and socially—doing so facilitated understanding the epistemological inquiry about the nature of knowledge and learning about multiple realities. Koch (1995) described hermeneutic phenomenology as an understanding that occurs through synthesizing horizons, pre-understandings, and the interpretive framework.

Population and Sample

This study was a single-institution study. Participants included in the study were nurse educators for Year 4 students at a university in Ontario who have utilized vSim for Nursing™ program for virtual simulation and debriefing. Each participant was required to have an undergraduate degree in nursing, registered with the College of Nurses of Ontario and a graduate degree in nursing education, population health, health care management or a related discipline. At the time of the study, there was no requirement for specialized simulation certifications

requirement for instructors using vSim for Nursing™ in this program. There are about 200 nursing faculty for fourth-year students in this institution, between full-time, part-time and adjunct. Of those, approximately 20 nurse educators used the vSim for Nursing™ for software as the basis for debriefing, which was, therefore, the population for the study. To reduce any perceived influence between the participants and myself, I sent the program coordinator the study invitations, who then sent the invitation to the potential participants. The use of a third party to communicate with participants avoided reducing the voluntariness of the study (Bender et al., 2017). Seven participants responded to the study invitations, which was an appropriate number for a phenomenology-based study seeking information-rich insight from participants (Onwuegbuzie & Collins, 2017).

Invitations

In the invitation to participate, I introduced the study topic, outlined eligibility criteria, the time commitment required of participants, confidentiality, location, and investigator contact. As Fiesler et al. (2018) discussed, the invitation was distinctly different from the consent form sent to participants before the online interview. There invitations were sent to the nursing faculty via email. The program coordinator sent the invitations in July 2021, and participants were given two weeks to respond. Five participants responded within the two weeks; as the study aimed to obtain six to eight participants, another study reminder was sent out. In the following week, two additional participants responded to make seven participants. It is noted that the end of August was a busy time as instructors were preparing for the following semester that started in the first week of September. In addition, two people in the sample responded via email to say that they recognized the importance of the study; however, they were highly overloaded with work. After approximately three weeks, all the consent forms were signed. The participants were asked to

provide two times over the next two weeks that they were available to be interviewed. Five of the participants wanted to be interviewed within four to five days of receiving the invitation email. Two participants opted to do the interview seven days from when the email was sent.

Data Collection

I conducted semi-structured online interviews via the web platform Zoom, a common data collection method in the healthcare profession (Richards & Hemphill, 2018). In this case, the instrumentation tool was the interview guide (see Appendix D) and included approximately seven open-ended questions to elicit expressive and in-depth responses. I chose to refrain from exact interview questions and instead created an interview guide. The nature of a semi-structured interview encourages dialogue; it can help reveal concepts that may not have initially been included in the questions (Majid et al., 2017). My choice of semi-structured interview questions is further justified by my constructivist approach to the data collection method, which supported the more in-depth exploration of lived experiences. It was vital for me to facilitate follow-up questions when necessary to add richness and validity to the data to clarify the meaning of an issue or question for the participant (Richards & Hemphill, 2018). The interview guide's first question collected demographic data about the participants, including years of teaching experience and current faculty employment status. The open-ended and non-leading questions encouraged the participants' free sharing and expression without indirectly suggesting how they should answer them. My constructivist approach to creating the interview guide was informed by strict ethical rigour, including piloting it in advance with two faculty members at different institutions (Majid et al., 2017).

The interviews were audio-recorded in Zoom and transcribed using the integrated Otter.ai function. Zoom and Otter.ai are recognized as protected methods of recording and transcribing

data as they share a secured cloud server. Transcriptions for qualitative data are essential for systematically recording, processing, coding, and understanding the data while reducing the laborious task of manually typing the transcript. I chose to use Zoom and Otter.ai as the integrated programs were more conducive to a seamless transition to transcribe data and reduce the risk of sharing data with multiple servers. In addition, as I was keeping a research journal, using the integrated Otter.ai function allowed me to highlight and make notes immediately after the interview to support my reflective journaling. Finally, faculty members were asked to describe their experiences, lessons learned, and feelings about improving the nurse educator role relative to debriefing practices.

NVivo was chosen for the data analysis to best support this research study's data collection and analysis. To ensure that the transcription was correct, I utilized member checking as a tool to establish the truth of the research study's findings. Member checking is characterized by sharing the transcription with the participants to verify that it reflects what they said in the interview and conveys the intended message (Candela, 2019). Candela (2019) explained that member checking is a central and ubiquitous part of creating qualitative research trustworthiness. I reviewed each audio recording multiple times to ensure the transcription was correct and made the appropriate edits so that the participant interviews were transcribed verbatim. The transcripts were emailed to each participant, and they had the opportunity to review them and make any changes to their answers; this was done over a week. All of the transcripts were verified by participants, and those transcripts were the ones used for the analysis. Two participants chose to make minor revisions to their transcripts; the other five participants made no changes. The interviews lasted 30-60 minutes.

Data Analysis

Familiarization of the Data

After each interview, I reread the final transcripts and my research journal entries multiple times. Reviewing the data supported discovering meaning and interpreting the data; it allowed me to immerse in and become familiar with the data before coding. Coding was employed to group textual data into smaller parts that could be examined for conceptual data similarities and differences (Elliott, 2018). This study used open-ended interview questions to explore and understand nurse educator experiences in virtual simulation debriefing (Creswell et al., 2020).

Code Generation

Open or inductive coding was used for the data analysis as there is no predetermined direction for the dialogue (Fujiwara et al., 2020). As the HSSOBP (2021) are relatively new and they are only starting to include current evidence of virtual simulation; capturing implications and possible contributions to best practice were critical to support the improvement of instructional design and faculty development. Hence, the themes were not predetermined but instead created once the data was coded. The justification for choosing open coding was that it supported the assessment of the educational program's effectiveness, development, and measurement as there were no fixed themes before data collection (Williams & Moser, 2019). The approach to the data was latent as it went beyond the descriptive level of data. As this was a phenomenological analysis, a latent approach highlighted underlying ideas, thoughts, and assumptions to find meaning. Examining the data provided insight into the context of the situation and the participants lived experiences.

Overall, there were 3173 coded units; 513 were co-coded, meaning that 16.2% were co-coded. Approximately three interviews were coded out of seven, meaning that 35.7% of the interviews were co-coded; I coded the rest of the data independently. The data was broken into smaller segments, and codes were created based on the context of that sample.

Co-coding ensures that multiple researchers coding a data set have come to the same conclusions. The subsequent section describes the methodology that was employed during the co-coding process. A co-coder and I coded segments at both the beginning of the interviews and towards the end of the interviews to ensure the coding framework was comprehensive. The last interview coded was participant seven, which was randomly decided on through a coin toss to avoid bias as to which interview was co-coded. Once all the interview data were coded, I used a single item search to ensure that every mention of a specific word was coded under the correct node. I used a flat coding framework to balance the data, meaning that initially, there was no hierarchy between principles (Feng & Behar-Horenstein, 2019). The coding framework identified parent, grandchild and great-grandchild codes which are expanded on in Chapter 5 and codes were finalized, I used nodes that displayed multiple codes even within the same text segment as a means to reference the themes (Vitouladiti, 2015).

Using nodes allowed me to adapt to the codes' organization and flexibility as it permitted me to merge themes or delete them as needed. To view specific quotes associated with a particular node, I utilized coding stripes, which allowed me to use audit trails to provide verification and context when discussing the findings. Using a flat coding framework ensured that each code had the same importance and specificity level (Silver & Lewins, 2014). As a constructivist researcher aiming to assimilate others' experiences and my own to find meaning,

hierarchies emerged from the data. I reflected on any hierarchies that arose in the data collection through journaling, as discussed in Chapter 5.

Verification and Inter-Rater Reliability (IRR)

In qualitative research, coding is foundational to having credible data to build a logical chain of themes and to support the discussion. I utilized an external person (co-coder) to verify the codes; the coder was offered compensation. Church et al. (2019) discussed that the researcher views the data through the lens of their own knowledge and experience. Data can be seen in many ways; a second external coder was hired to prevent this lens from concealing participant experiences and meanings. The second coder was someone with experience in qualitative coding data and familiar with instructional design and program evaluation best practices (Wicks, 2017). The co-coder was decided upon based on a professional referral; the co-coder did not have a background in nursing but was very experienced in qualitative coding using NVivo. As the co-coder did not have a background in nursing, it further supported our extensive discussion of the meaning and contributed to code differentiation for a robust framework. The discussions and shared negotiation of codes contributed to establishment of a coding framework and creation of descriptions for each code to ensure that the meaning for each code was well-defined. Establishing a detailed framework was critical as each coded unit could be coded to multiple areas. For example, some coded units were coded to challenges, benefits and potential best practices. Thus, without a well-defined framework, one person may not have coded the unit to all the same places, resulting in disagreement and affecting inter-coder reliability. There were seven participant interviews to code; we co-coded three interviews which was 35.7% of the seven interviews. The co-coded data was done in segments to identify disagreements early in the process and thus adjust the framework as needed. Identifying coding disagreements can help find

codes that are not well-specified and, consequently, improve credibility by developing theoretical clarity (Nili et al., 2017). The intercoder reliability was 98.4% which is regarded as an exceptionally high level of reliability in the context of qualitative data.

I reviewed the context, purpose, and methodology with the co-coder to improve their understanding of the study and answer any questions. Wicks (2017) discussed that coding requires an understanding of context and qualitative coding decisions, which often evolve as a researcher develops increasing sensitivity to this context and their data. Each code's definition and meaning were discussed to establish consistency. Code definitions were used to create a codebook to document concrete definitions. Co-coding minimized personal preference in the data coding, and any discrepancies were discussed and modified in the codebook. Samples of the transcripts were independently coded and compared; iterations were made to the codebook to reach a consensus of themes and meaning.

All of the units that were used to establish inter-coder reliability were purposely chosen from the interviews. We coded Interview 2 together to build the framework; in total, 150 units (29.2% of all co-coded units) were coded together for Interview 2. Next, we purposely and chronologically selected one section after another from Interview 3 to code independently. Our aim at this point was to test the coding framework and establish our level of inter-coder agreement. After independently coding each section of Interview 3, we reconvened to discuss coding disagreements, adjust the framework and coding definitions as needed, and then resorted the units that we had initially disagreed upon to achieve 100% agreement. We independently coded 264 units (51.5% of all co-coded units). While there was a greater number of disagreements during the coding of the first section of Interview 3, the level of inter-coder agreement increased as we reached the end of this interview. On average, we agreed upon 260

(98.5%) of the units coded for Interview 3. When 20% of the un-coded data remained, the other coder randomly selected Interview 7. Data from the first part of the interview were then randomly selected to be coded independently by each coder. Results were compared after that and 100% agreement was discovered. Then a second random selection of data from the remaining sections of interview 7 was coded in isolation before reconvening to compare results; once again, 100% agreement was found. In all, a total of 99 Interview 7 units (or 19.3% of all co-coded units) were independently coded; no disagreements were discovered. When the percentage of codes in the agreement was the desired 80-90% on 95% of the codes, the data was verified as accurate and sufficiently coded for this research study (Belotto, 2018). Establishing an IRR helped mitigate interpretive bias and provided consistency with the coding. To establish an IRR most accurately, participant transcripts with a sufficient number of codes were used to decrease the likelihood that the IRR would be skewed. The more codes there are, the less likely one singular code discrepancy could impact the IRR (Malviya & Berdanier, 2019).

Audit trails in qualitative research are transparent descriptions of the research steps taken from the beginning of the data collection to the development and reporting of findings (Belotto, 2018). In this study, audit trails were created throughout the discussion that included examples of participant statements and theme descriptions. The similarities and differences were thus transparent for the higher confirmability of the findings. Furthermore, the data were organized to discuss the findings so that each research question could be addressed systematically (Cardano, 2020). My interpretation and data discussions were based on the most authentic representations of participants' narratives as determined through member checking, audit trails, and external coder verification.

Instructional Design

Reigeluth (2013) discussed instructional design as one of the most critical aspects of efficient student learning through high-quality learning materials that consider students' strengths and weaknesses. Though instructional design is complex and recognized as a discipline in itself, this study considered formative evaluation as a part of the instructional design of the nursing program being studied. Simulation practice and instructional design are part of an iterative process in which one continuously informs the other (Lou et al., 2014). For simulation to be efficient and transformational, it needs to be contextually based, current, and correspond to student and educator needs (Jeffries, 2020; Reigeluth, 2013). Historically, to improve clinical performance, a student-centred instructional model was the source for simulation activities (dos Santos Almeida et al., 2018). Jeffries (2012) stated that the lack of an educational framework "prevents scholars from conducting research in an organized, systemic fashion, and influencing factors to become elusive, as does the effectiveness of various parts" (p. 26). The analysis, design, development, implementation, and evaluation (ADDIE) model is not new; however, its implementation and application to virtual simulation can be used to recognize the procedural steps of instructional design (Noh et al., 2020). ADDIE has undergone many iterations in the past, and instructional designers in various disciplines have adapted more flexible and iterative progressions that suit their objectives (Cheung, 2016). Recognizing the importance of procedural steps, this study as a formative evaluation contributes to identifying the value of nurse educator perspectives to improve the design, implementation, and evaluation of practices in the online environment (Cheung, 2016). Relative to this study, data collected from the study as a formative evaluation may improve the instructional design process that is already in place for the nurse educators.

Formative Evaluation

Consideration of evaluation theorists may support an improved instructional design for future virtual simulation debriefing regarding formative evaluation. For this study, I used Merriam's (1988) seminal approach to case study research to best fit the qualitative phenomenological study. Merriam's (1988) approach to case study research primarily requires more extensive and comprehensive guidance for the data collection procedures appropriate for qualitative research, including interviewing. Merriam (1988) explains the techniques and procedures researchers need to become effective users of the suggested collection tools. To exemplify, when describing interviewing as a data collection tool, Merriam (1988) explains topics such as the importance of asking open-ended questions, asking prompting questions, the interview guide, beginning the interview and the interaction between interviewer and respondent. Although there are other theorists, such as Stake (1995) and Yin (2002), who also did seminal work in case study research, neither Stake nor Yin concentrates on these aspects of interviewing in the data gathering process as much as Merriam (1988).

Consequently, Merriam's (1988) approach to case studies was the most appropriate for this qualitative study's data collection methods and design approach. For the data analysis, I kept notes and a journal to consider meaning throughout the process, as suggested by Merriam (1988), who also stated that by collecting data and analyzing it while engaging in reflection, the two processes are more integrated and can help the researcher be more aware of partiality and data saturation (Merriam, 1988).

Ethics and Rigour

Validity in qualitative research is controversial as descriptive data do not measure performance but provide a detailed account of experiences to identify patterns and meaning

(FitzPatrick, 2019). Instead, trustworthiness and credibility are more accurate indicators to assess the appropriateness of tools, processes, data, and methodology (Cope, 2014). Credibility is a critical aspect of qualitative research and was achieved in this study through disclosure and data analysis triangulation. The research process was clearly explained, including what measures have been used to achieve trustworthiness. Transparency allows the participants and readers the opportunity to draw their own conclusions (Cope, 2014). As discussed, to verify the themes identified from the coding, an external coder, member checking, and audit trails were used to demonstrate the linkage of themes to corroborate verbatim quotations as evidence.

Confidentiality and Data Security

Confidentiality and respect for participants were critical in this study. Participants' names were removed from the interview data and replaced with an ID number so that there were no identifying factors associated with each participant transcript. Surmiak (2018) explained that participant protection employs anonymity methods such as removing identifiers. Protecting participant identities contributes to building trust and rapport with the participants, facilitating open sharing, and maintaining the research process's integrity (Surmiak, 2018).

The protection of research data is a fundamental ethical responsibility that all researchers should uphold. Data retention varies, depending on the discipline, research purpose, and personal identifying factors, if applicable (Alase, 2017). The Microsoft Excel sheets, consent forms, transcriptions, coded data and analysis data were recorded electronically as a strategy to keep the data organized and accessible while reducing the risk of misplacing hard copy data. The strategies for protecting participants' identity were outlined in the invitation and informed consent; in addition, the consent forms with names and signatures were secured by being stored in a safe, password-protected area. To adhere to the strict ethical rigour in this study, the data

were stored on an online server that was encrypted and password-protected, backed up on an external hard drive and stored in a locked area that only the researcher has access to. The interview data were collected between May and June 2021 and followed by data analysis and discussion from August to October 2021. Given that the research process from data collection to writing the dissertation was conducted over 6 months, the data will be retained and then destroyed after five years from the start date of data collection, which aligns with Research Ethics Board (REB) guidelines for this type of research (Hesse et al., 2019).

Generalization and Transferability

Generalizability supports drawing broad inferences to represent certain populations (Smith, 2018). Generalizability is not a limitation but more accurately refers to how a theory developed within one study may be used to provide an enlightening approach for the experiences of other individuals who are in similar circumstances (Smith, 2018). Thus, although this study's findings are specific to nurse educators involved in virtual simulation debriefing, transferable aspects of faculty development, funding, support, and role differentiation may apply to a much larger group of educators outside of the institution being studied and across other disciplines.

Reflexivity and Trustworthiness

Considering ethical issues in research is critical in protecting human rights and conducting an equitable study. As van Manen (2016) discussed, a lived experience is an interpretive process in which the researcher is part of the world and understands the phenomenon by interpretation but not without partiality. Research typically stems from a researcher's curiosity or fascination with a phenomenon. Within the qualitative researcher community, it is understood that instead, research should consider rigour, trustworthiness, and reflexivity given qualitative research's subjective nature (Thorne et al., 2016). I have discussed my positionality using a

constructivist paradigm in support of my research approach. Reflexivity concerns careful, analytic self-awareness of the researchers' experiences and reasoning during the research process. Reflecting on openness, closeness and distance to the research helped support my awareness of my role as the researcher and the potential of power relations in qualitative research (Dodgson, 2019).

Since I knew some of the participants in this study, I utilized a relational approach to the research. Ozanne et al. (2017) discussed that relational engagement built through persistent interactions between academics and others encourages sharing and trust both during and after the research is completed. As I am a part of the university's network, relational engagement could help create more productive interactions and improved social networks in the nursing education community (Davis & Ozanne, 2019). Trust between the researcher and the person being researched can significantly impact how much participants disclose; without trust to discuss reflection and experience, it can cause participants to be reluctant to tell the truth as sharing can create a sense of vulnerability. Therefore, the relational approach to research in a nurse educator community in which I am included supported establishing good quality relationships that entailed reciprocal interactions and co-learning (Davis & Ozanne, 2019). With relational engagement, there can be an inherent power imbalance with a vulnerability and positionality difference between the researcher and participants (Davis & Ozanne, 2019). The study participants were not required to be full-time faculty. Consequently, as an adjunct faculty member, I recognized and anticipated the possibility of a potential positionality difference.

Power relations were a crucial aspect of this study concerning ethics and rigour. During the investigation, I was vigilant in identifying the obvious and subtle ways that power relations could be created during the dialogue. To address power relations, I discussed with the

participants that dialogue is an ongoing engagement that is relational, co-constitutive, and does not have a preordained direction or outcome (Fusch et al., 2018). As an adult educator within the respective field and a graduate student, it was necessary to recognize that the phenomena being studied form my current educational and professional realities. Understanding that my perceptions, challenges, and experiential learning could impact the study was critically important, especially given its qualitative, interpretive heuristic design, (Fusch et al., 2018). To document my self-reflection and awareness, I kept a safe, encrypted journal through the research process as a part of my research accountability. I included relevant parts of my journal reflections in this final paper.

Triangulation

Triangulation in qualitative research attributes to the comprehensive understanding of phenomena using multiple methods to cross-reference the same information (Fusch et al., 2018). Doing this can create a more inclusive understanding of the data, findings and better-articulated nurse educators' phenomena (Renz et al., 2018). This study used various triangulation strategies, including multiple theoretical and data source triangulation. In addition, the study used educational and medical peer-reviewed journals, books, and current and seminal literature as a part of data source triangulation. Using the NLN Jeffries Simulation Framework, the SAM approach to instructional design contributed to theory triangulation used to discuss the thematic findings and suggest pragmatic recommendations for nursing practice and future research (Allen & Sites, 2012).

Credibility and Trustworthiness

I read the College of Nurses (2016) and INACSL (2016) guidelines for research to ensure that this study aligned with standards of research ethics in nursing and simulation. The College

of Nurses (2016) is responsible for regulating registered nurses. The organization facilitates the ongoing self-assessment and continued competence of members and supports the public's confidence in the nursing profession. In collaboration with the simulation teams at the institution, we had a preliminary discussion regarding the alignment of best practice guidelines for research and its application in this study, which was an essential first step in understanding the research ethics process at an Ontario University. Merriam and Tindell (2015) discussed that receiving advice from professional bodies improves a study's trustworthiness through clinical governance and data protection when conducting research. I received research ethics approval from Athabasca University and the institution with which the participants are associated.

Summary

This chapter described the qualitative phenomenological approach as the selected research design as it was the most appropriate methodology to answer the research question. The theoretical framework explanation was used to demonstrate how constructivism complements my constructivist paradigm and reflective learning. The NLN Jeffries Simulation Framework was used to provide an overview of simulation activities and establish the critical relationship between simulation design, teacher, student, educational practice, and outcomes. My role and positionality were described to understand my grounding in the research better. The data collection section was followed by discussing the data analysis and coding processes. Lastly, I addressed credibility, trustworthiness, and ethical considerations as critical to achieving academic and research rigour. The upcoming Chapter 5 describes the results from the study by identifying the most predominant to least predominant codes for the collective group and individual participants, which are then translated to themes. Verbatim quotations are used to represent the sentiments of the participants.

Chapter 5: Results

Introduction

This study aimed to examine nurse educator experiences of virtual simulation debriefing practices using the program vSim for Nursing™ at a university in Ontario. The focus of inquiry was a formative evaluation that examined the perceptions of training and prerequisites of the nurse educators before debriefing, the differences between in-person versus online debriefing, and may offer contributions to the development of future best practices to support faculty development. First, this chapter presents the qualitative data, the inter-coder reliability, and the description of codes. Next, the data for the collective group are presented in terms of total codes and the code distribution from the highest to lowest parent codes used to create a coding hierarchy. The parent codes were used to develop themes and quotations that represented each one. Then, the chapter examines individual participant data by discussing the percentage of codes attributed to each person. Finally, each participant is compared to the collective group to identify the themes and compare them to the overall trends.

The Results chapter is presented without any interpretation to ensure that the findings are distinctly clear from my perceptions of meaning. It is followed by a discussion and Conclusion chapter, encompassing interpretation, discussion of themes, and answers to each sub-research question. The participants were asked four questions to gather demographic data: age, years of teaching in a nursing program, the highest level of education (degree completed), and employment status. Although the demographic questions were asked in the semi-structured interviews and not through a survey, this method was chosen to build trust and rapport with the participants before asking more in-depth questions about their experiences.

Research Question

As stated in Chapter 3, the overarching research question was “What are the experiences of nurse educators who facilitate virtual simulation debriefing sessions?” The sub-research questions will be discussed in Chapter 6 as part of the thematic analysis.

Interview Scripts

Seven participants were interviewed via Zoom using a semi-structured interview guide (see Appendix D). The interviews were transcribed using Otter.ai, revised by the researcher to ensure the transcription was accurate and added punctuation to improve its readability. Each transcript was sent to each participant to be member-checked. Two out of seven participants made minor changes to their interview transcripts. Once the member checking was complete, the final transcripts were used for the data organization and analysis using NVivo software.

Hierarchical Coding Framework

The co-coder and I collaborated to establish a coding framework that acted as a blueprint for coding all seven transcripts. Once all the data were coded, the hierarchical coding framework that emerged represented how the codes were organized and the relationship between them. The highest level of codes is referred to as parent codes; each parent code had child codes (the second level of codes) and grandchild codes (which were subthemes of the child codes). Throughout the Results chapter, each unit is equal to one percent in the figures. There were ten parent codes in total. All parent codes were represented in the total units; each unit was equivalent to one sentence, including those that did not develop any themes. Phrases that were neutral and were not part of the themes were called *uncoded* and *study comments*. Examples of the parent code *Uncoded* were sentences such as "Of course, yeah"; examples of the parent code study comments were, "after this is done, it would be really interesting to see some if there are any common ones

[among faculty advisors]." The parent codes were used to create themes which are later discussed to elaborate on participant experiences. The highest parent code of the hierarchy was *best practices*, followed by *training, challenges, benefits, opportunities,* and *experiences*. The four themes identified were "*Demographics and Prerequisites of Virtual Simulation (VS) Debriefers," "Improvement and Contribution to Best Practice," "Experiences and Challenges of VS Debriefing,"* and *"Benefits and Opportunities of VS and Debriefing."*

Figure 6

Hierarchical Coding Framework

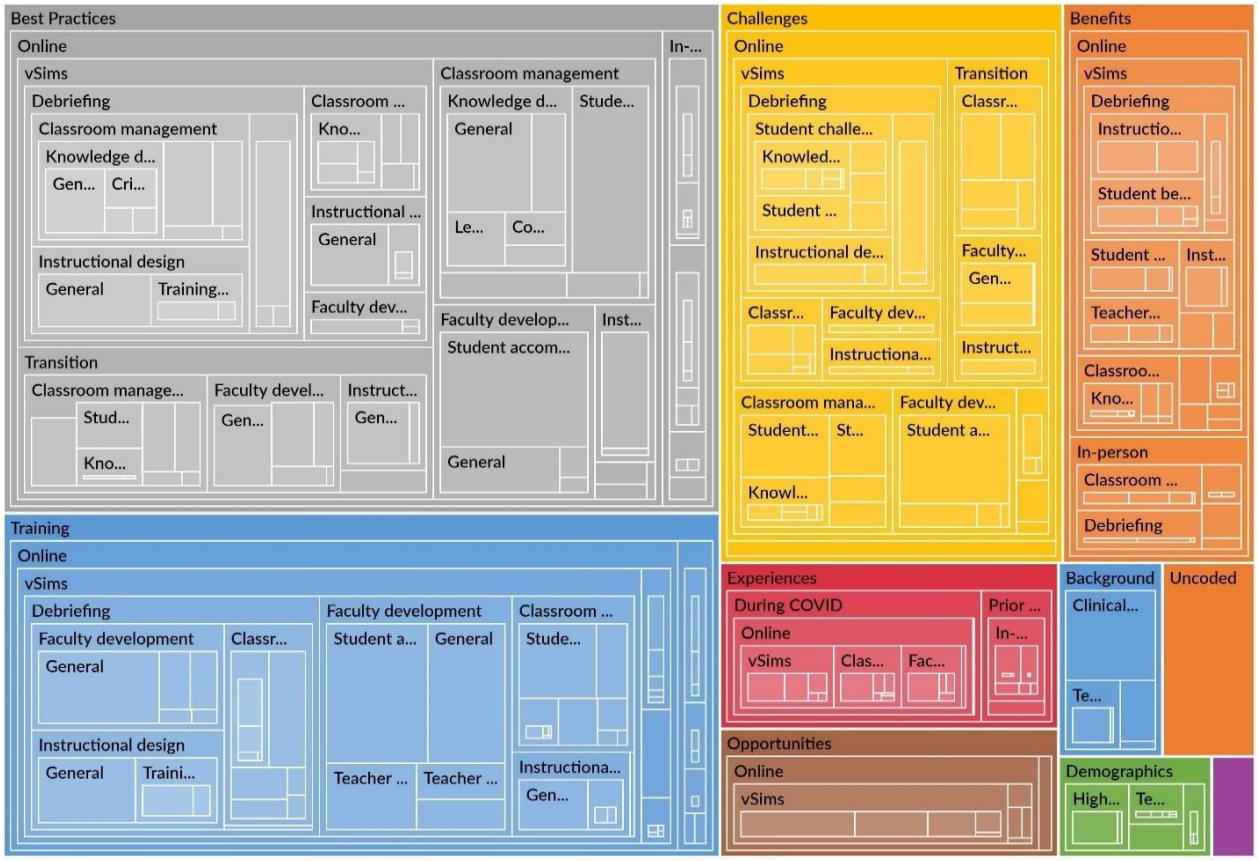


Figure 6 presents the overarching parent codes with their respective lower-level codes. The largest boxes on the hierarchical framework illustrate the most predominant parent codes, within the parent codes are child, grandchild and great-grandchild codes. In this framework, the

largest box or level one code was *best practices*; the smaller boxes within each one represent the connection between higher codes (more broad) and lower-level codes (more specific). Other first-level codes were *training, challenges, benefits, opportunities,* and *experiences.* Lower level codes included common child and grandchild codes such as *online*, *vSims, debriefing* and *classroom management.*

Coding Reliability and Agreement

Inter-coder reliability is used as a measure of consistency used to evaluate the extent to which different researchers agree with their decisions. Each unit of analysis is recognized as one sentence. Kurasaki (2010) recognized that 90% agreement and higher during independent coding were adequate as a high degree of reliability when coding open-ended interviews. There were 3173 coded units; 513 were co-coded, meaning that 16.2% were co-coded. Initially, 150 units were co-coded to establish the coding framework. Three interviews were coded out of seven based on the sample size, meaning that 35.7% of the interviews were co-coded.

Figure 7

Inter and Intra-coder Statistics for Each Section of Data Co-Coded

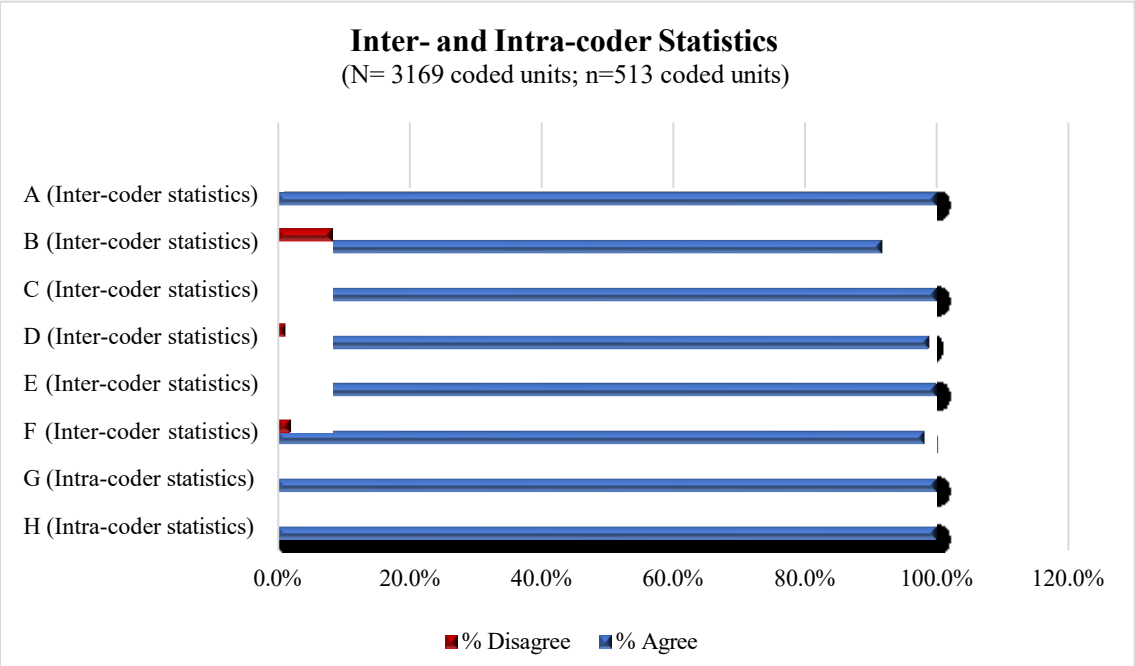


Figure 7 represents the inter-coder statistics in the study; the coding sections were divided into segments of text to make the coding process manageable and to calculate and identify disagreements early in the process. All of the units used to establish inter-coder reliability were purposely chosen from two of the first interviews. The co-coder and I coded one interview together to build the framework. Then we purposely selected one segment after another from the next interview to code independently as we tested the framework and established our independent inter-coder agreement levels. The data was broken into segments and labelled A through H. The data presented shows that the first disagreement was found in segment B (the second segment of text that was coded), which was close to the beginning of the co-coding. Through negotiation, it was concluded that a new code needed to be added to the framework. When 20% of the uncoded data remained, the co-coder and I randomly selected another interview to be coded independently by each coder. Results were compared, and units initially

disagreed upon were resorted to achieving 100% agreement. The top bar in Figure 7 represents the average percentage of agreements which was 98.4%.

Demographics

Table 1

Demographic Data for all Participants

Age	# Participants	%Participants
60 +	5	71.4%
30 - 39	1	14.3%
50-59	1	14.3%
Total	7	100%

Employment	#Participants	%Participants
Sessional	5	71.4%
Full-time	1	14.3%
Part-time	1	14.3%
Total	7	100%

Highest Degree	#Participants	%Participants
Masters	6	85.7%
Masters completed	6	85.7%
PhD	1	14.3%
Ph.D. completed	1	14.3%
Total	7	100%

Teaching Years	#Participants	%Participants
16 years +	2	28.6%
11 – 15 years	3	42.9%
6 – 10 years	1	14.3%
0 – 5 years	2	28.6%
Total	7	100%

The demographic data were collected during the semi-structured interview. The general statistics showed that out of 3173 total coded units with all participants, 46 were demographic data, translating to 1.5% of the total data. Each participant represented 14.3% of the sample.

Background

The first question of the interview guide asked participants to explain their background and experience with virtual simulation debriefing.

Figure 8

Child Codes for the Parent Code Background

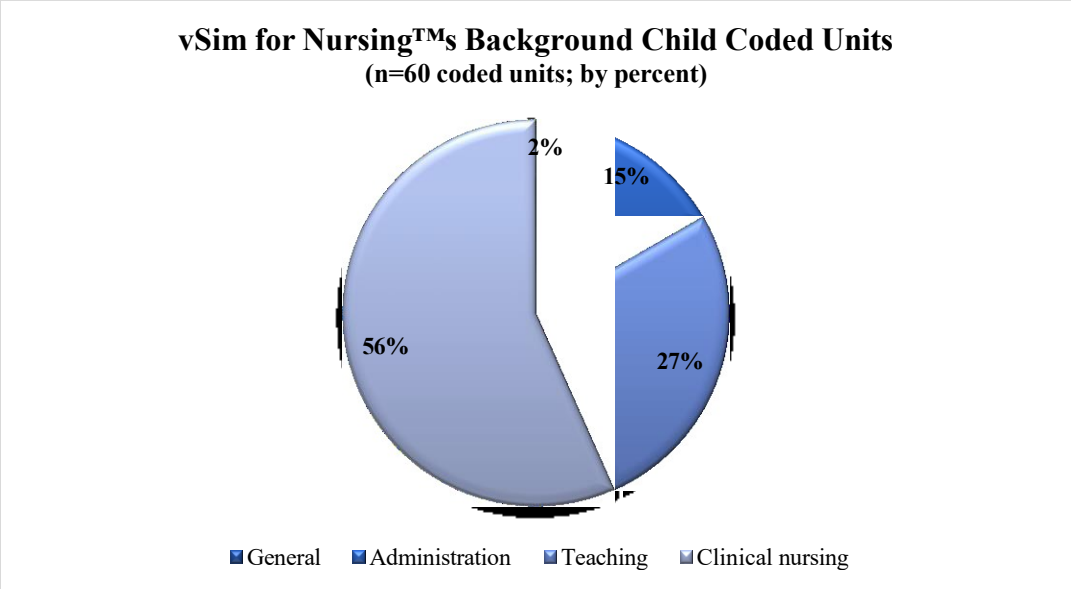


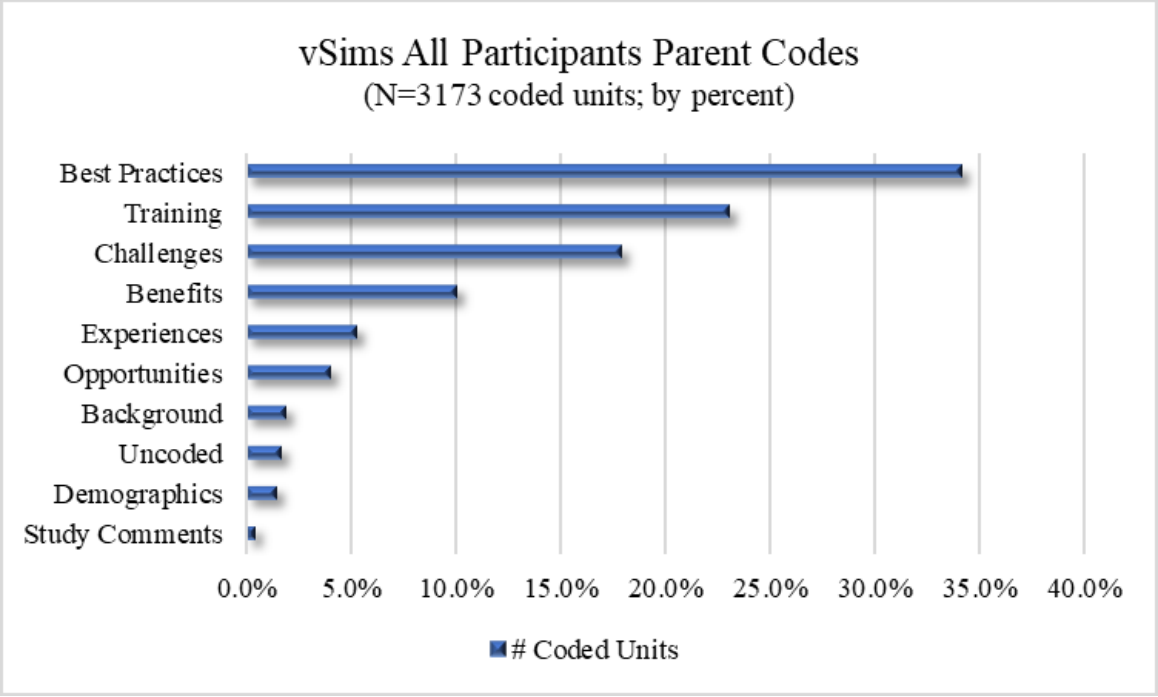
Figure 8 represents the participants' background; the child codes in this section were *general, administration, teaching, and clinical nursing*. Overall, the total background codes were 60, representing 1.9% of the total codes. The child code of *general* had one unit (1.7%) of the coded units, *administration* had nine sub-codes (15%), *teaching* had 16 (26.7%) of codes, and *clinical nursing* had 34 (56.7%) of the coded units.

All Participants

Each parent code for the collective group provides a basis for the themes. The themes and sub-themes in relation to answering the research questions are discussed in more detail in Chapter 6. The parent codes are shown from the highest to the lowest frequency of coded units (comments).

Figure 9

Parent Code Totals for All Participants as a Collective Group



There were a total of 3173 coded units. The parent code *best practices* had the highest number of coded units, being 1084 (34.2%) of the total codes. *Training, challenges, benefits, experiences* and *opportunities* were other parent codes assigned to the issues raised by participants.

Best Practices

There were 1084 (34.2%) units coded as *best practices*. In-person *best practices* had 78 coded units (7.2%), *online* had 1006 (92.8%) coded units.

Figure 10

Child Codes That Comprised the Parent Code Best Practices Comparing In-Person and Online

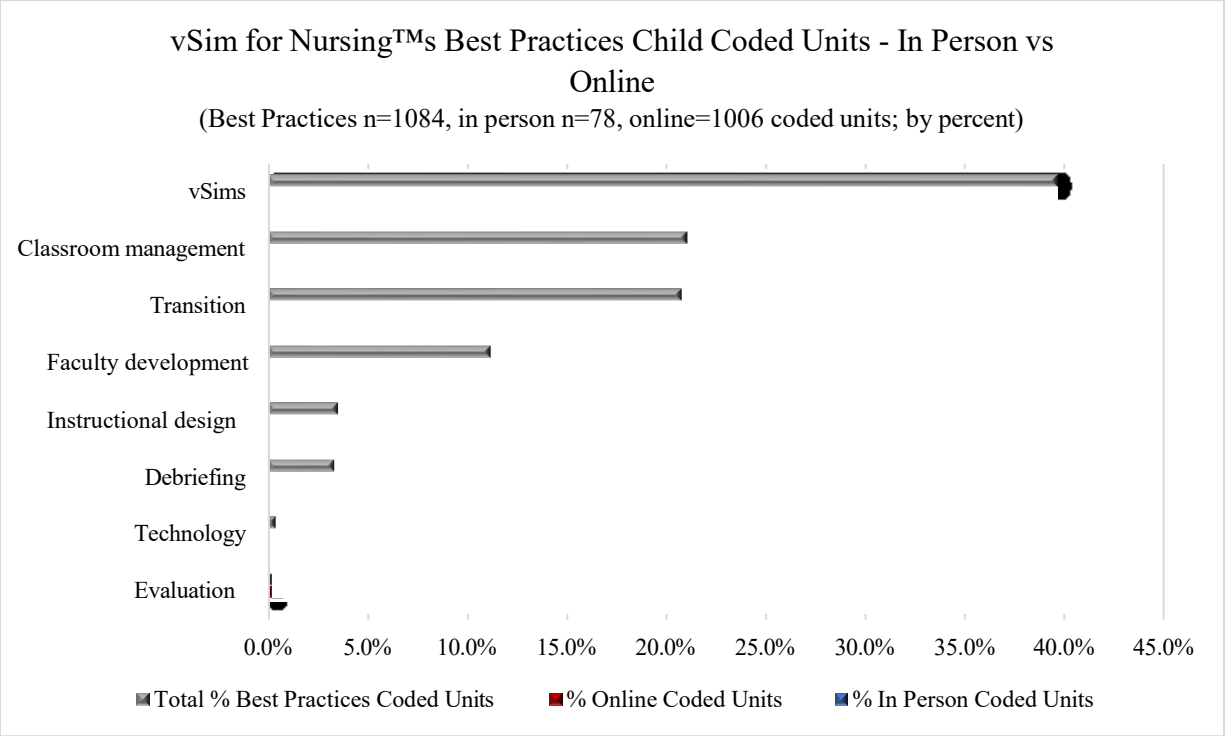


Figure 10 represents the best practice child codes for comparing in-person and online. It was evident that participants discussed the benefits of *vSims* [vSim for Nursing™], *transition* and *classroom management* the most.

Every participant discussed the potential of best practices as a central aspect of their experience. For example,

> P4: The vSim adds to the accessibility of education and exposure of clinical cases. I think it increases their knowledge that maybe they wouldn't have gotten elsewhere. The debriefing is a good indicator to see if they can critically think about their actions or if they have the knowledge and judgment to make clinical decisions for certain types of patients.

Theme translation. The parent code *best practices* were reflected in the theme *Improvement and Contribution to Best Practice.* The code *best practices were* combined with improvements as participants spoke about program improvements that could inform best practices.

Training

There were 3173 codes; 729 (23%) were coded to the parent code *training*. In-person training had 37 coded units (5.1%), and online had 692 (94.9%).

Figure 11

Child Codes That Comprised the Parent Code Training Comparing In-Person and Online

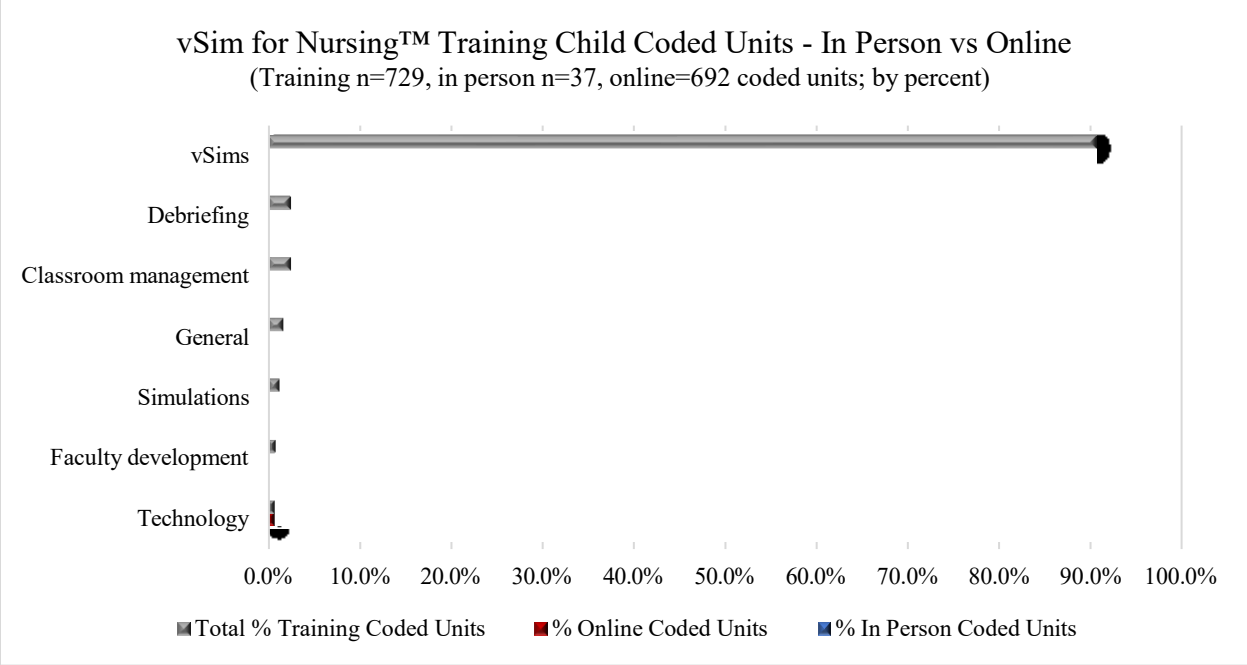


Figure 11 shows the child codes for in-person and online training relative to the total training coded units. Ninety-one percent of the codes about training were related to online training, specifically identified as the child codes, *vSims*, *debriefing* and *classroom management*. In relation to this theme, one example offered was,

> P1: I think that it's what I feel [the need to have a framework to provide consistency] is what I noticed since I've been doing this now since 2017. So, it's like, I guess my fourth year doing it. And for me, coming from the clinical aspect as well as an employer, I really think that there'll be a lot of value in focusing on critical thinking for the fourth level nurses, becoming more autonomous, and there needs to be a way to streamline that process.

Theme translation. The parent code *training* referred to participant experiences that could inform best practices and improvement; the participants discussed this at length.

Furthermore, the parent code *training* provided the basis for the theme *Improvement and Contribution to Best Practice.*

Challenges

Out of the 3173 units, 569 of them were challenges (18%). Challenges in-person had 16 coded units (0.3%), and online had 558 (97.3%). I further broke down the parent code *challenges* into *vSims, transition [to online], classroom management, faculty development, technology, general, instructional design*, *debriefing* and *evaluation.*

Figure 12

Child Codes That Comprised the Parent Code Challenges Comparing In-Person and Online

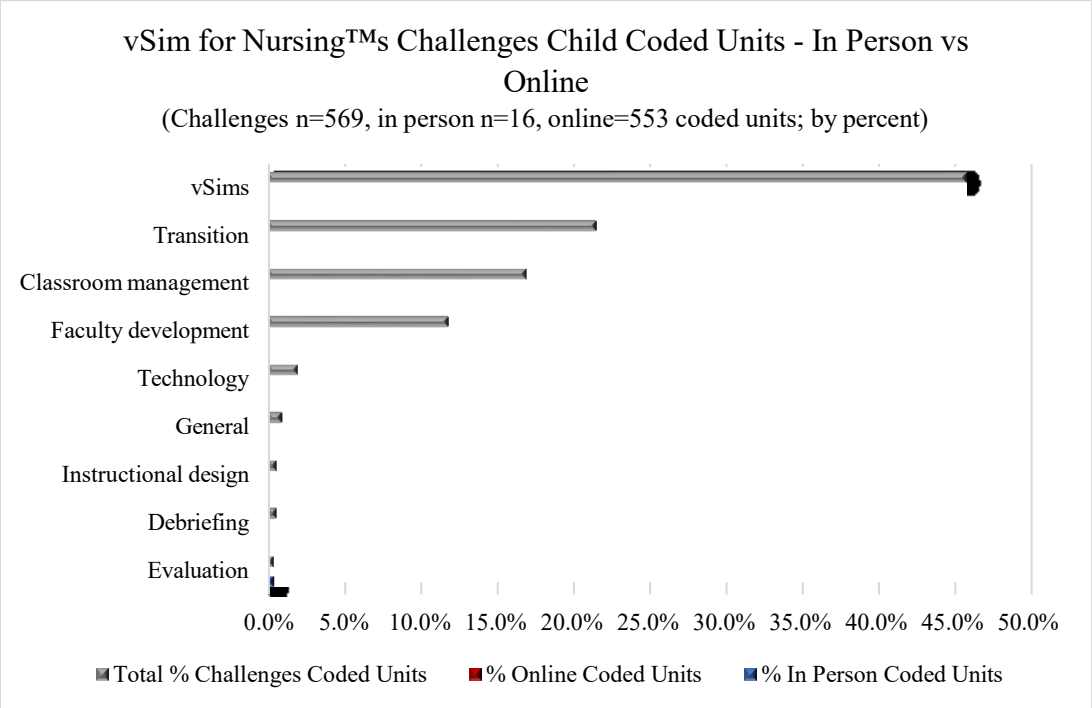


Figure 12 describes the parent code *challenges* child codes for in-person and online for comparison. It was concluded that the participants primarily explained their challenges the most in *vSims, transition* to online teaching, online *classroom management* and online *faculty development*. The parent code *challenges* emerged as a central concern in the participant's

comments; they described their challenges in different ways, including classroom management, engagement and faculty development.

One example that was representative of participant challenges in the area of classroom management was explained as,

> P2: Sometimes, you don’t even know what questions to ask because there’s the tech stuff, people joining late, and just more distractions online. But usually, it's better to be in person. Basically, seeing what they're doing and getting them prepared for the clinical setting. In-person simulation lets them get the muscle memory of performing skills; online; it is not the same. I felt that a lot of students stated that they weren't as comfortable sharing or speaking up because they were staring at the camera, and it wasn't the same as the person.

A description of a challenge related to engagement was,

> P5: For me, it wasn't necessary if that aspect was in person or over Zoom because students had already done [the] scenario by that time. Right, okay, they have all done that, and I knew that because of the deadline, and I didn't debrief them before they hit the deadline for them. But as far as engagement and getting them to participate, it [vSim for Nursing™ debriefing] was harder. They turned their cameras off sometimes, which made it even worse.

One challenge relating to faculty development was described as:

> P4: I think it [having a teacher mentor] would help in my own development as an instructor, as well as ensure that you know, like, we're all on the same page, and we're identifying, I guess we needed more ways to support student learning as things arise.

Theme translation. The parent codes *experiences* and *challenges* were represented in the theme *Experiences and Challenges of Debriefing*.

Benefits

There were 3173 coded units, and *benefits* accounted for 319 codes which represented 10.5% of the total units. As this study examined virtual simulation and how it compares to online virtual simulation, the coded units for the parent code *benefits* and its child codes in-person and online were compared.

Figure 13

Child Codes That Comprised the Parent Code Benefits Comparing In-Person and Online

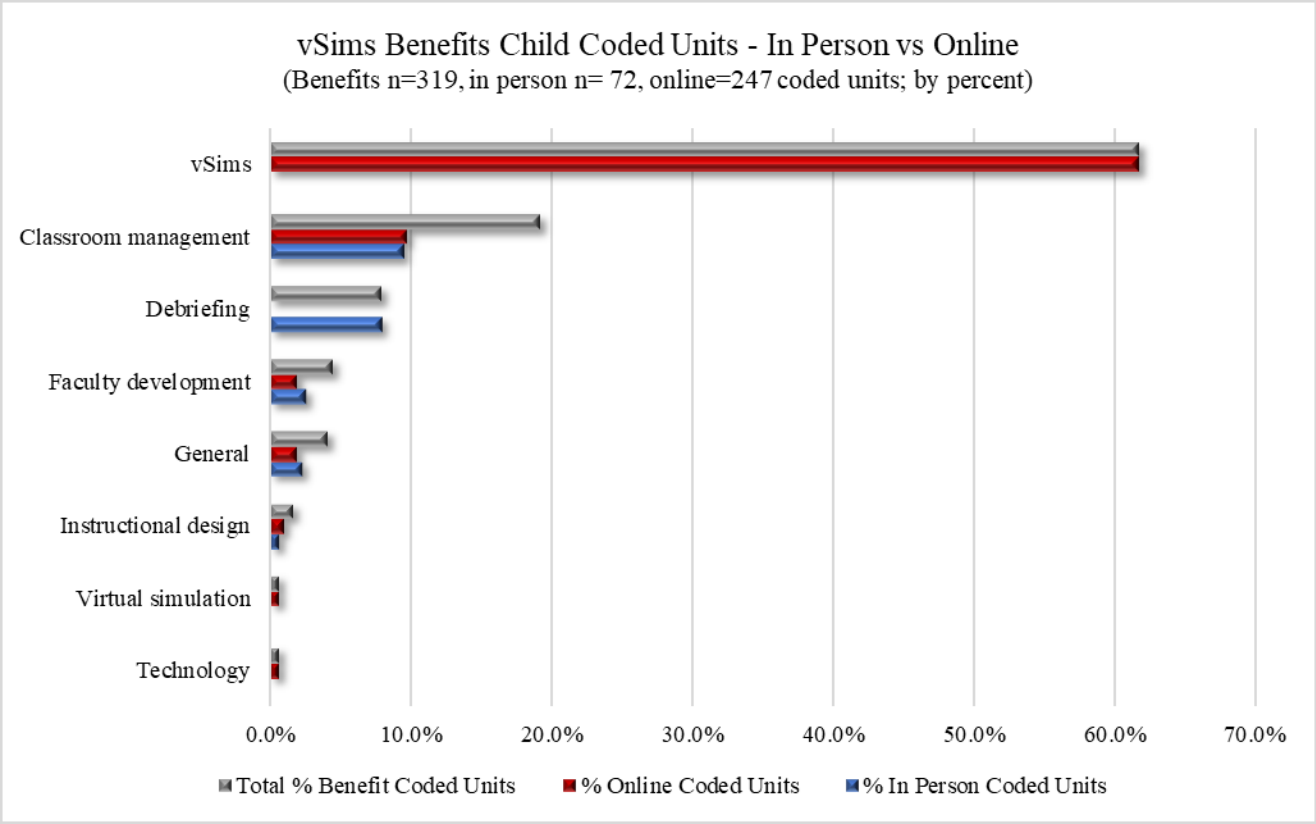


Figure 13 compares shows the parent code *benefits*; participants offered ideas the most about in-person *classroom management* and *debriefing*; for online, participants predominantly

described benefits associated with virtual simulation (labelled *vSims*) and *classroom management.*

Translation to theme. Participants described the benefits of virtual simulation and potential opportunities for nursing education and preparedness for clinical practice. Consequently, the parent code *benefits* was represented in the theme *Benefits and Opportunities of Virtual Simulation and Debriefing.*

Opportunities

There were 3173 coded units; the parent code opportunities had 129 coded units, which translated to 4.1% of the total.

Figure 14

Child Codes That Comprised the Parent Code Opportunities Comparing In-Person and Online

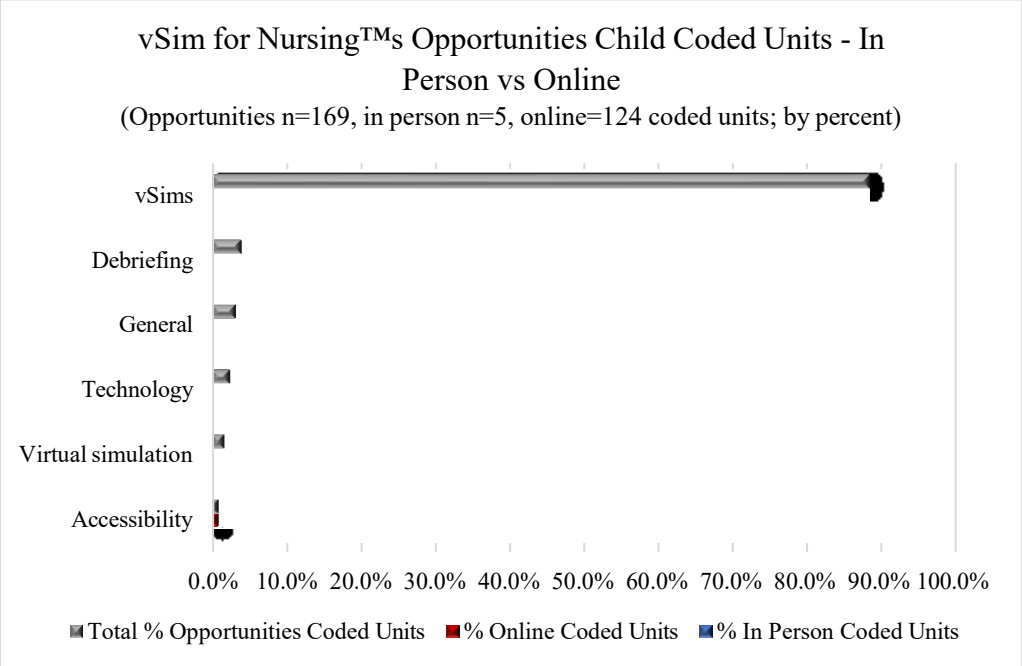


Figure 14 represents the child codes for the parent code *opportunities, comparing in-person and online*. The data showed that when explaining opportunities, participants mostly offered ideas about *vSims* [vSim for Nursing™] and *debriefing*.

Translation to the theme. Participants described potential opportunities that vSim for Nursing™ VS offers to nursing education. Consequently, the parent code *opportunities* was represented in the theme *Benefits and Opportunities of Virtual Simulation and Debriefing.*

Experiences

There were 3173coded units, and experiences accounted for 167 codes (5.3%). Experiences were divided into in-person, with 32 coded units (19.2%) of the total experience units, and online experiences had 135 coded units (80.8%). Participants were asked to describe the differences between online and in-person debriefing.

Figure 15

Child Codes That Comprised the Parent Code Experiences Comparing In-Person and Online Both Prior to Covid and During Covid

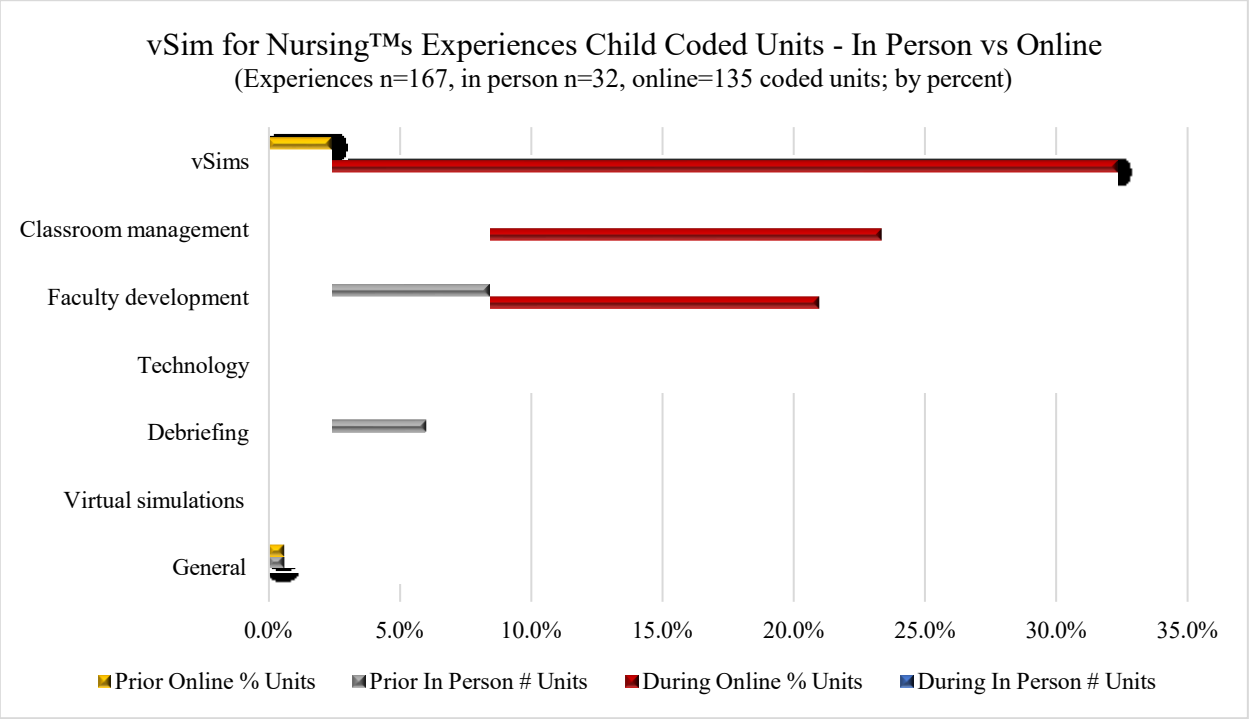


Figure 15 displays that participants shared experiences mainly on the use of *vSims, classroom management* and *faculty development* in relation to online learning.

Theme translation. When participants were asked to describe their experience of in-person and online debriefing, they often associated their experience with challenges in the online setting; thus, the parent code *experiences* were was represented in the theme *Experiences and Challenges of Debriefing*.

In summary, the data pertaining to all participants as a collective group was coded as parent codes and child codes. The findings demonstrated that participants spoke the most about the parent codes *best practices, training and challenges,* followed by *benefits, opportunities, and experiences*. The hierarchical tree represents the most predominant parent codes and associated child codes utilized to create themes. The themes identified were "*Demographics and Prerequisites of Virtual Simulation (VS) Debriefers," "Improvement and Contribution to Best Practice," "Experiences and Challenges of VS Debriefing,"* and *"Benefits and Opportunities of VS and Debriefing."*

The successive section describes each participant's parent and child codes from the highest frequency of coded units (comments) to the least.

Individual Participants

This study is grounded in Interpretive phenomenology, underpinned by the philosophy that individuals as people are as unique as their life stories. Describing the child codes that comprised the parent codes in the in-person and online settings provided an overall understanding of the collective group. Examining the lived experiences of each person demonstrates the rich context and individuality of one's experience, which acted as a basis for the co-construction of meaning. This next section examines sub-each participant's parent and child codes in reference to the overall findings. Each participant had a different amount of data,

ranging from 153 to 1168 coded units with an average amount of 453 coded units (comments).

Participant 1

Participant 1 had 1168 coded units. The parent codes are presented from highest to lowest in frequency.

Figure 16

Parent Codes for Participant 1 Compared to All Participants

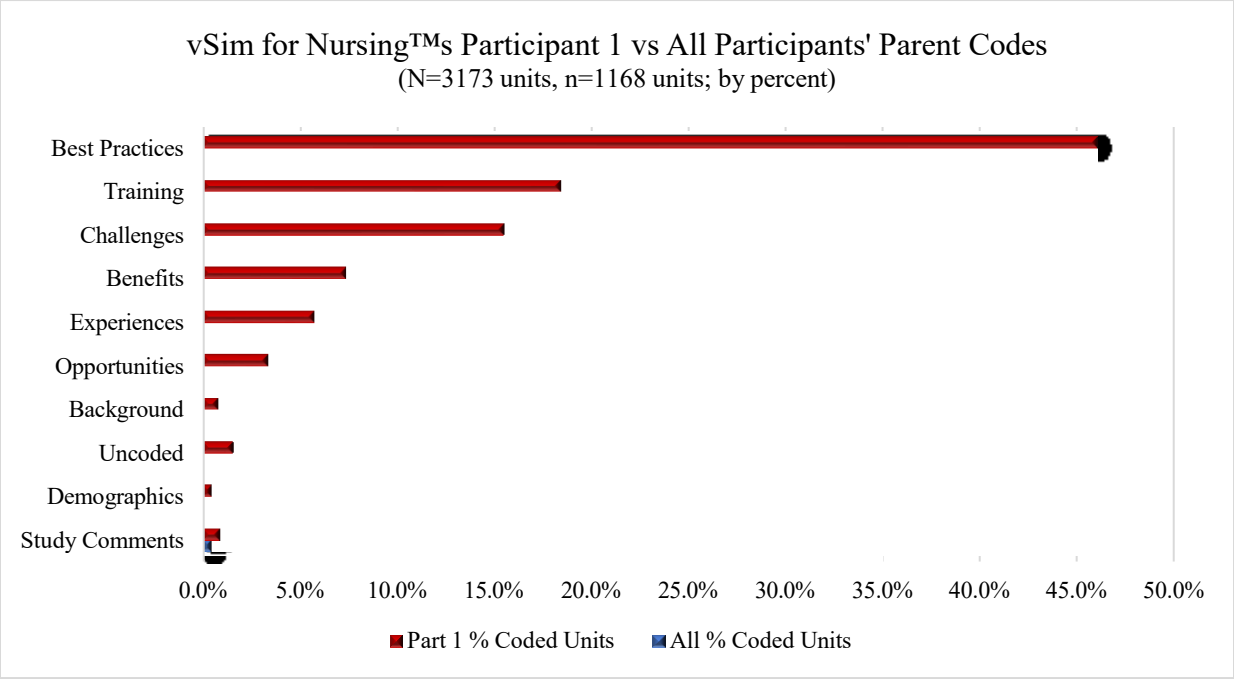


Figure 16 shows the breakdown of the parent codes for Participant 1.; For Participant 1, *best practices* had the highest number of coded units being 538, representing 46.1 % of the coded units. An example of how this participant described their experience was,

> P1: There's a lot of freedom, an awful lot of freedom really [when debriefing]. I don't think there was a major framework to follow at all. I think it would be a good idea to have somewhat of a framework for consistency. Being in the fourth year, I tend to really focus on that whole transformation from being a student to gaining your own autonomy and thinking about how you need to contribute. Participant 2

Out of the 3173 coded units, 153 units were from Participant 2 (4.5%) of the total. The parent codes for this participant were *benefits,* which had 41 coded units (26.8%) and *challenges* had 36 coded units (23.5%).

Figure 17

Parent Codes for Participant 2 Compared to All Participants

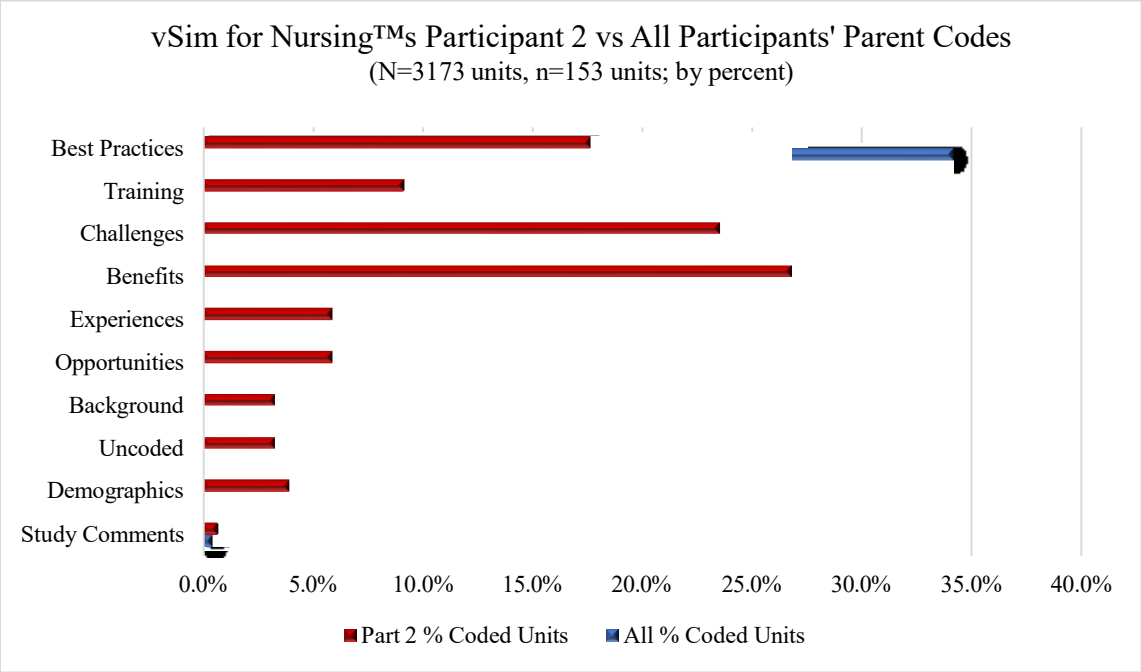


Figure 17 represents the Participant 2 parent code breakdown compared to all the participant codes. *Best practices* for Participant 2 represented 17.6% of the coded units compared to 34.2 % for all participants. Participant 2 spoke the most about *benefits* and *challenges*. An example of this participant offering a suggestion for future best practices was,

> P2: If there was a middle person that could help between us and the course leads, that would have been good. We do it in the hospital when there's a new skill or process. One nurse or the charge nurse has extra training. So, we don't have to email our managers or educators every five minutes.

Participant 3

Participant 3 accounted for 270 coded units, 8.5% of the total codes. The parent codes were *best practices*, which had 61 coded units (22.6%). This participant's most discussed parent codes were *best practices, training,* and *challenges*.

Figure 18

Parent Codes for Participant 3 Compared to All Participants

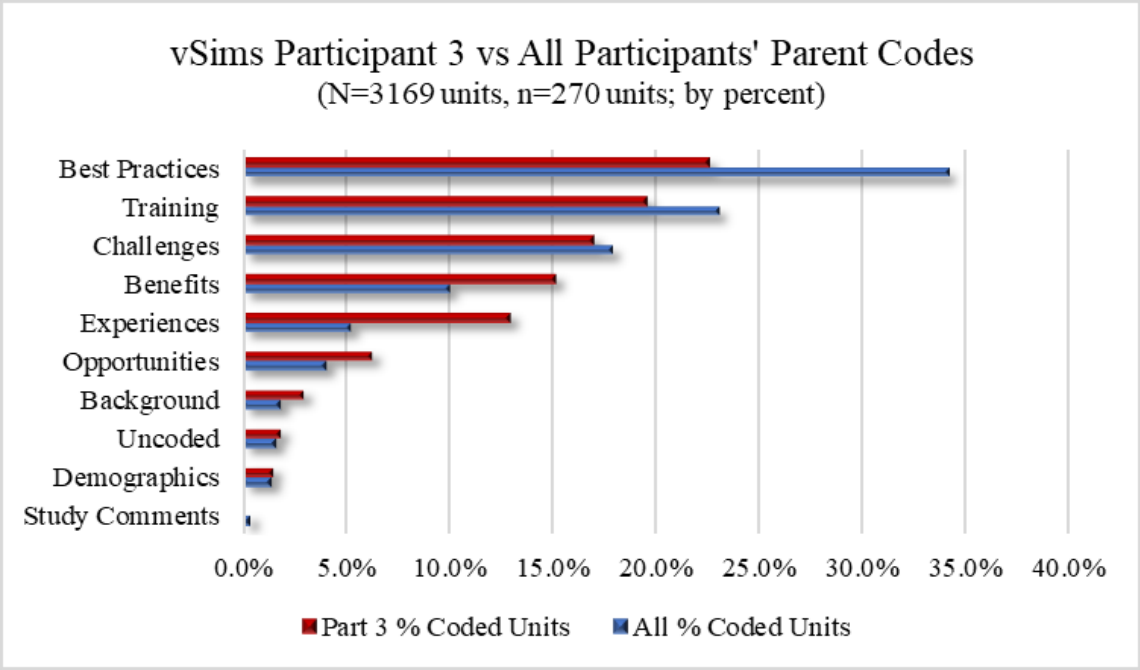


Figure 18 compares this participant's parent codes with the collective group. Starting from highest to lowest, *best practices* for Participant 3 was 22.6 % compared to the collective group; Participant 3 had the highest number of parent codes as *best practices, training and challenges*. An example of this participant offering ideas about challenges was explained as,

> P3: Yeah, if you do something a long time ago versus watching it happening in an in-person sim, it's a lot easier. Remember, some of these students are also going to clinical, too. So, by the time they get to us, all their patient care becomes a blur.

Participant 4

Participant 4 accounted for 352 of the codes, translating to 11.1% of the total coded units. Participant 4 discussed the most about *training, challenges* and *best practices*.

Figure 19

Parent Codes for Participant 4 Compared to All Participants

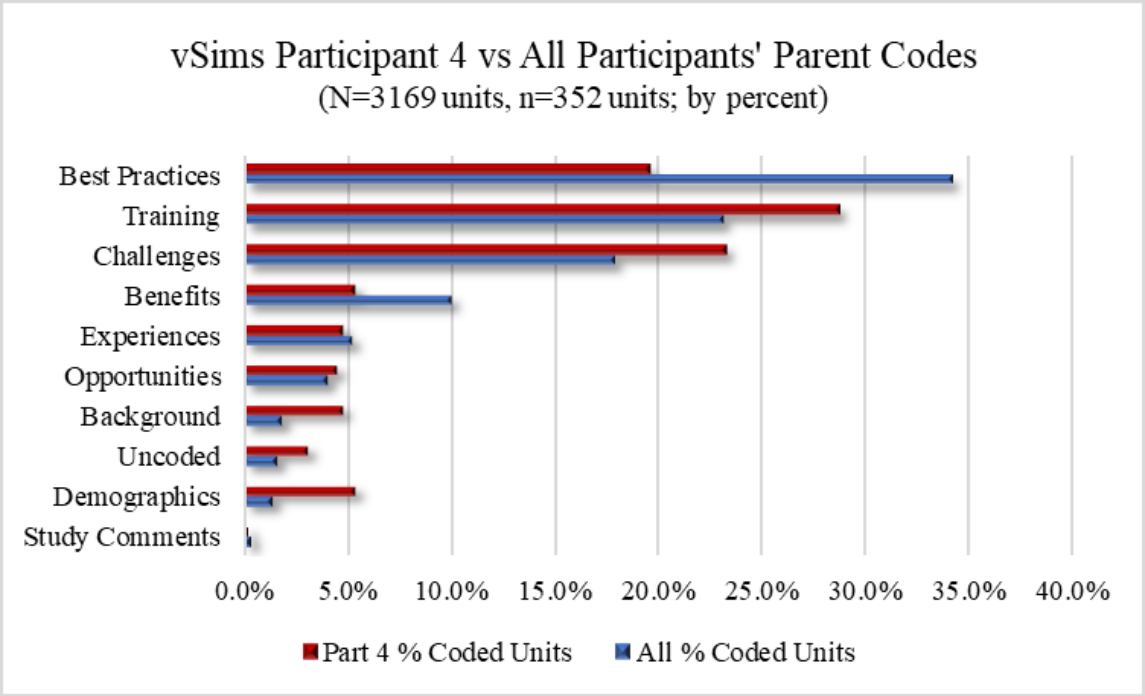


Figure 19 represents participant 4's parent codes in comparison to the collective group. *Best practices* for participant 4 was 19.6% compared to the group, which was 34.2%; It was evident that they spoke more about *training* and *challenges* than others in the group and less about *best practices* compared to the group. An example of this participant explaining their experience was,

> P4: So, I definitely did that [used the debriefing hint sheet]. To be honest with you, I only learned that by sort of messing around with the program, you know, trying to figure out how to do it right, make it the best experience for the students, right?

Participant 5

Participant 5 had 358 coded units, which translated to 11.3 % of the codes. Participant 5 spoke the most about *best practices, training,* and *challenges.*

Figure 20

Parent Codes for Participant 5 Compared to All Participants

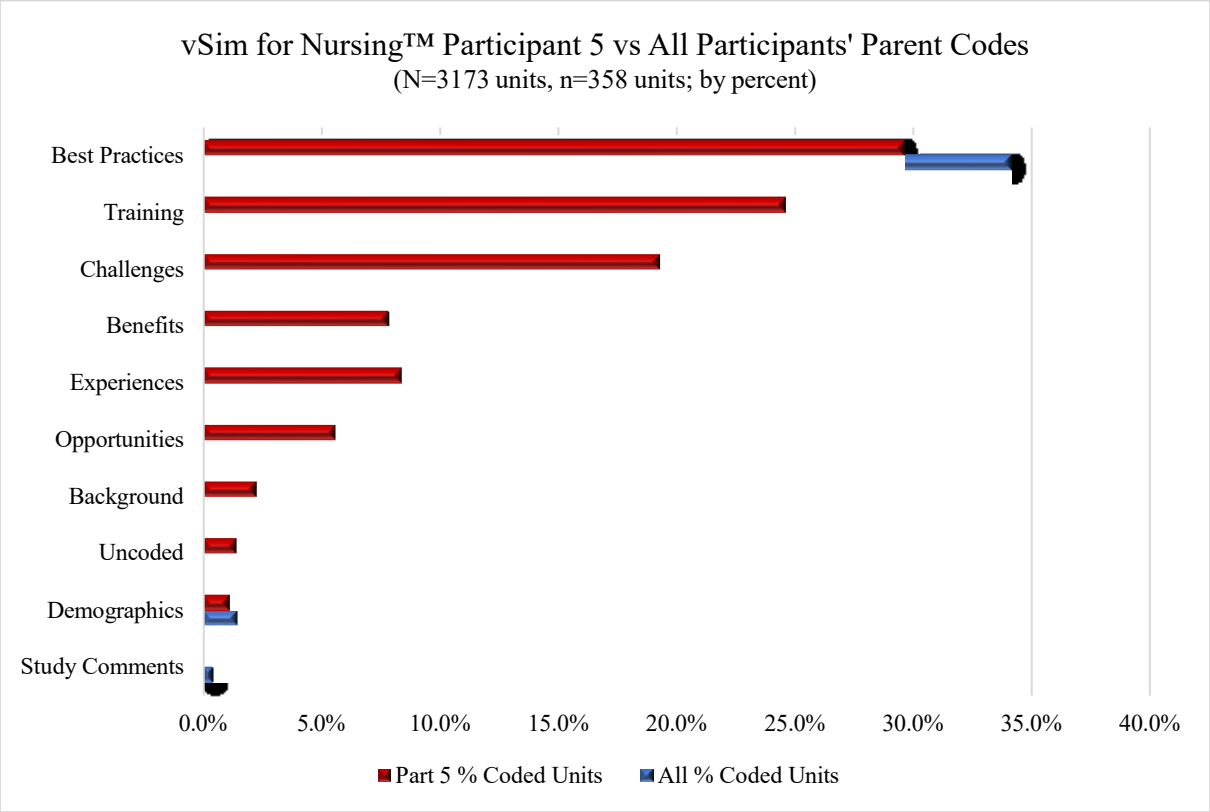


Figure 20 represents Participant 5's parent codes compared to the total group. *Best practices* for Participant 5 represented 29.6 % of the coding unit compared to the 34.2% for the group. Participant 5 explained the most about *best practices, training, and challenges*, which was congruent with the group's most discussed parent codes. An example of this participants ideas about the benefits of vSims for Nursing™ was,

P5: I think that its [vSim for Nursing] best use is to supplement clinical experience. Well, I did find that some of those [vSim for Nursing] simulations were very well done; there

was a lot of learning to be had. And it also allowed the students to learn more about areas where they actually did not have a placement like mental health, and so there definitely were benefits [from] it.

Participant 6

Of the total codes, 541 were from Participant 6, which translated to 17.1% of the total coded units. Participant 6 spoke the most about *best practices, training,* and *challenges.*

Figure 21

Parent Codes for Participant 6 Compared to All Participants

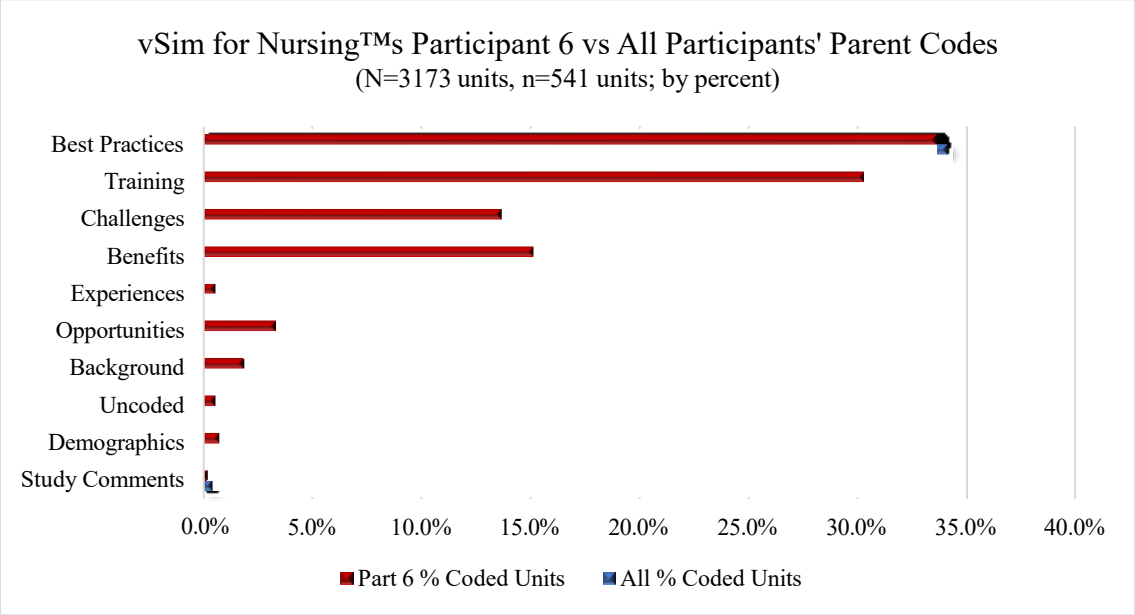


Figure 21 represents Participant 6's parent codes compared to the collective group's parent codes. In terms of *best practices*, the participant had 33.6% compared to the 34.2% for the group. The data shows that when compared to the whole group, participant 6 spoke the most about *best practices*; they also focused on *training* and *benefits* rather than *challenges*. For example, when explaining future best practices and using a debriefing framework, they said, P6: "Once you learn frameworks and ways of organizing one's thoughts around things; using them and refining them, you can always use it."

Participant 7

Of the 3173 total coded units, 330 of them were from Participant 7, which translated to being 10.4% of the total codes.

Figure 22

Parent Codes for Participant 7 Compared to All Participants

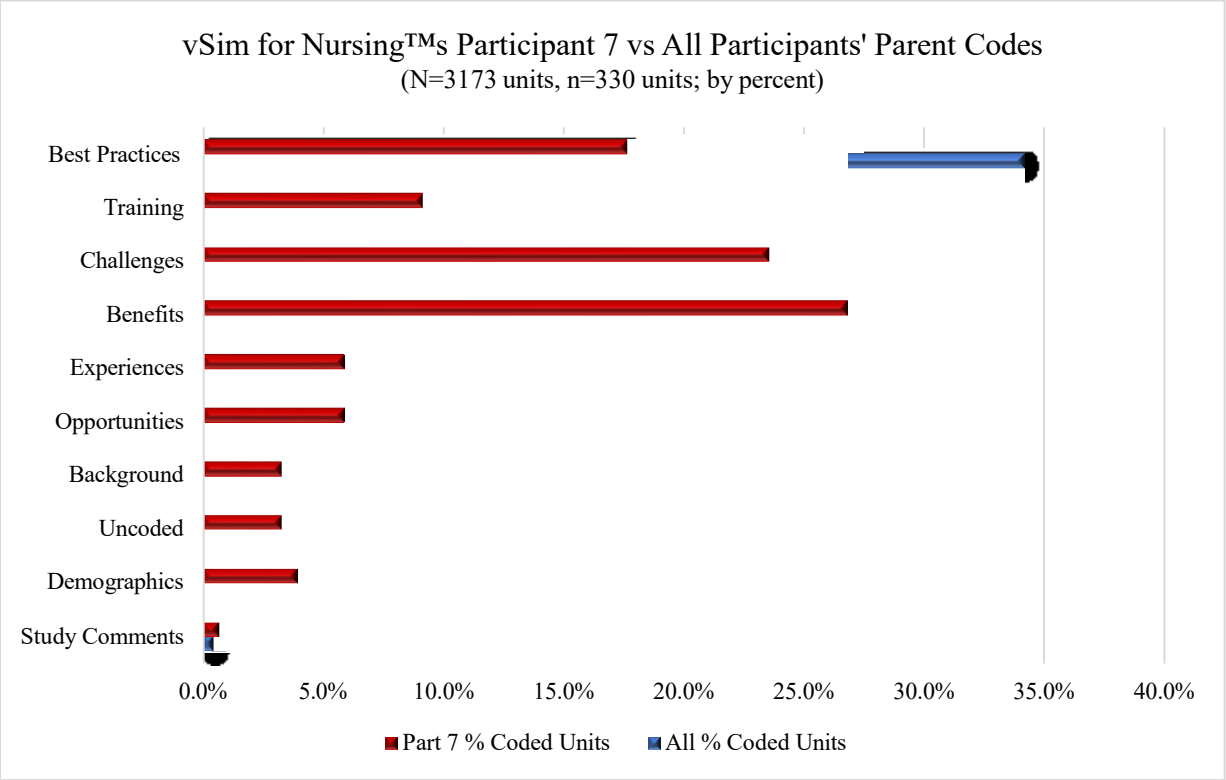


Figure 22 represents Participant 7's breakdown parent codes compared to the rest of the participants. Starting from the highest number of codes going to the least, *best practices* for the participant were 17.6% compared to 34.2% for the group. Participant 7 spoke the most about *benefits* and *challenges* significantly more than the group average. For example, this participant described their experience as,

P7: I would perhaps suggest finding a way to have the vSims in real-time, even though they're online; that way, we can all do it together and work through the problems

> together. Rather than, you know, I feel like there were very many reasons and technical difficulties that came along with that [doing vSims asynchronously].

The findings for each individual participant's parent and child codes described what each person spoke about the most. Different participants had varying focuses during the interviews. For example, participants one, three, five and six said the most about *best practices* and *training*, participant two focused on *benefits* and *challenges*, participant four spoke the most about *training* and *challenges,* and participant seven spoke the most about *best practices* and *challenges.* The findings related to the individual participants demonstrated variation regarding the focus of the interviews and recognized the unique nature of individual lived experiences.

Summary

Chapter 5 presented the study's findings, including the high reliability of the intercoder agreement. The chapter opened by first looking at the number of total codes and how those codes were divided into parent codes. The parent codes provided the basis for the development of themes in the data, which were visually represented the as the hierarchical coding framework (Appendix I). Samples of verbatim quotes were presented to represent each of the themes. The most discussed codes amongst the collective group were best practices, training, challenges, and benefits. Looking at each person's parent codes individually provided a more comprehensive understanding of the study's themes: "*Demographics and Prerequisites of Virtual Simulation (VS) Debriefers," "Improvement and Contribution to Best Practice," "Experiences and Challenges of VS Debriefing,"* and *"Benefits and Opportunities of VS and Debriefing."*

Finally, the individual participant interviews were compared to the collective group trends; these individual variances will be discussed in the following chapter.

Chapter 6: Discussion

Introduction

Interpretive phenomenology (IP) is built on hermeneutic principles to provide an appropriate lens for examining participants' unique experiences (Frechette et al., 2020). IP is done in concurrence with the researcher's perception for meaning-making (Bush et al., 2019). This chapter utilizes the findings from Chapter 5 to provide a rich and detailed account of data about the participants' experience through verbatim quotations, literature, and thematic analysis. I approached the study with a phenomenological lens to reveal individual perceptions of participants' lived experiences to identify themes explained to answer the research questions. In this section, I will be discussing my findings in reference to relevant literature.

Themes

Interpretive phenomenology acknowledges the role of the researcher in interpreting participants' descriptions and co-construction of findings. I chose interpretative phenomenology to focus on participants' idiosyncratic experiences and their interpretation to best answer the research questions (Lee, 2015). The researcher's role in co-construction adds depth and strengthens the understanding of the data through reflecting and meaning-making. This chapter identifies four themes: "*Demographics and Prerequisites of Virtual Simulation (VS) Debriefer," "Improvement and Contribution to Best Practice," "Experiences and Challenges of VS Debriefing,"* and *"Benefits and Opportunities of VS and Debriefing."*

Theoretical Framework

Simulation education is regarded as experiential in nature; students have the opportunity to experience a novel situation, choose appropriate actions, and reflect on these actions in the debriefing (INACSL, 2016). This study focuses on debriefing, and therefore, it is crucial to

recognize the nuances between debriefing and reflection. Reflection is often a natural process for learners and typically happens in abstracted and unsystematic ways (Ross, 2021). Learners often start the reflective process by thinking about their actions in simulation and what experiences resonated with them. In contrast, debriefing formalizes reflection by taking a systematic approach to asking questions that are based on a theoretical framework (Lapum et al., 2020). By taking a methodical approach, debriefing helps students deepen their understanding and make the necessary modifications to future clinical practice. One of the foundation theories of simulation-based education (SBE) is Kolb's Experiential Learning Theory (1984), as it focuses on learning through doing. As this study did not primarily assess the actions in simulation but rather debriefing and how educators frame experiences for meaningful learning, I chose constructivism to best discuss that process. The phenomenological methodology explored how the educators experienced debriefing and with what strategies they approached the debriefing to create meaning. Each participant's experience is unique, and constructivism recognizes their uniqueness and proposes that people actively make sense of what is real (Ross, 2021). One of the most valuable assets of constructivism in this study is it facilitates the researcher’s greater tolerance and allows one to make sense of the alternative perspectives regarding the nature of truth and reality (Felton & Wright, 2017). Exploration of educator experiences helps identify gaps in instructional design and make improvements based on adult learning theories, pedagogy, and contextual challenges.

Research Question 1

What are the prerequisites, training processes, and materials required for a nurse educator prior to facilitating virtual simulation debriefing?

Theme 1: Demographics and Prerequisites of Virtual Simulation (VS) Debriefers

The collection of demographic information allowed for a better understanding of participants' backgrounds and identifying potential patterns in subpopulations within the group.

The majority (71.4%) of the participants were older than 60 years of age, one participant was between 50-59, and one was between the ages 30-39. When assessing the highest level of education completed, six out of seven participants had completed their master's degree, and one person had completed their Ph.D. Of the seven participants, five had been teaching for over ten years. Only one of the participants in the study was full-time, five were sessional, and one was part-time. Sessional employment is defined as a short-term contract for four months and less than 12 hours a week. In this population of instructors in this program, 85.7 % of the faculty were either part-time (14.3%) or sessional (71.4%). Spector et al. (2020) explained that many nursing programs have mostly part-time and short-term contracted staff; one of their recommended strategies for improving student licensing exam pass rates included focusing on creating a more balanced ratio of full-time and non-fulltime faculty and assessing whether faculty professional development needs were being met for both. Thus, capturing the voices of nursing faculty, including part-time, adjunct, and full-time, can provide support in improving employment ratios, policy change and fostering mentorship opportunities amongst faculty.

Most of the participants (85%) had over five years of experience in various areas of nursing, including clinical nursing, administration, and management; however, only one participant had formal simulation debriefing training. Based on the demographic data, the participant who was teaching full-time was provided with faculty development funds to specialize in simulation before this role; non-full-time faculty did not have funding opportunities for professional development specific to simulation or VS simulation and debriefing. A survey

conducted by the Canadian Association of Schools of Nursing (2020) found that 9,479 Registered Nursing faculty members were employed by schools of nursing in 2020, and only 26.8% of faculty members are permanent. Consequently, the data from this study mirrors the larger-scale study regarding demographics and the differences related to faculty development opportunities.

COVID-19 has significantly affected the use of simulation education and its integration into the nursing curricula, so much so that INACSL updated their standards of best practice in Faculty Development and Debriefing, which were inclusive of virtual reality simulation; these were published after my study. Recognizing that VS best practices were not updated at the time of the study may provide insight and rationale into why certain aspects were designed the way they were.

Furthermore, the updated SOBP (2021) may support a more robust instructional design and standardization of faculty development. It is critical to examine experiences and lessons to build robust, more innovative nursing curricula underpinned by simulation pedagogy and current best practice. Adopting current best practices that are evidence-based demonstrates a commitment to high-quality programs that align with the Canadian Association of Schools of Nursing accreditation requirements (CASN, 2020).

Training was one of the predominant parent codes in the study; it had 729 coded units (comments), which was 23% of all the data; it was further broken down into in-person and online training; online training was explained the most amongst participants.

Each participant was asked what prerequisites and training processes were required prior to starting the debriefing; six participants explained a webinar session with the vSim for Nursing™ vendor that faculty could sign up to attend; however, it was not mandatory. When

asked to explain, the participants said the webinar was more about the technological aspect of accessing the vSim for Nursing™ and looking up student grades, not the design of conducting the debriefing or how to use vSim for Nursing™ to support meeting the course outcomes.

One participant mentioned that typically to teach in year four of the program, they [faculty leadership] hire people who have experience because their experience is usually related to their ability to advise students through their last year of nursing. The problem described by participant four was that "simply having experience is too broad for this new type of teaching." Regarding teaching materials, Participants 3 and 4 stated that even though they had the webinar that explained how to access the vSim for Nursing™, they had to work through the scenarios independently and come up with questions before debriefing. One of the challenges that multiple participants explained was that using virtual simulation was time-consuming. They often had to go through it numerous times to prepare for the debriefing adequately. Time restraints and workload are further explained in Research Question 3. An exploratory study examined the use of the INACSL SOBP in virtual simulation debriefing (Badowski & Wells-Beede, 2022). The results showed that a lack of standardized practice guidelines contributed to the variability in practice. Therefore, debriefing in the online environment needs to be updated to suit the online environment both synchronously and asynchronously (Badowski & Wells-Beede, 2022).

Participants explained that the institution offered online modules to support teaching online. However, this was for the whole university and not specifically for this program or a requirement before starting. All participants explained that the teaching materials they could access were summaries from the vSim for Nursing™ and a "hint sheet" revising potential questions they could ask their students in the debriefing. It was clarified that the vendor provided this "hint sheet" and not the educational institution or program.

Personal Reflection. *As I reflected on my conversation with the participants, it was apparent that the faculty advisor role was instrumental to preparing students for entry to practice nursing; Year 4 is significant as students were consolidating their nursing knowledge and going into practice. Why was such an instrumental role not offered professional development to accommodate a major shift in course delivery and methodology towards achieving the outcomes? There may be the assumption that most faculty advisors had clinical or teaching experience with debriefing, which would directly translate to the online setting. However, it appeared that part of the problem was a disconnect between the administration involved in modifying the instructional design and the people affected by it. I recognize time constraints; however, conducting a learning needs assessment could have provided a more efficient way of developing educational resources. Another contributing factor for why the faculty advisors did not receive sufficient education was that leadership did not recognize how different online and in-person debriefing was and the workload involved. Perhaps improvements could have been made earlier if a pilot had been created and evaluated before starting the program?*

Based on my conversations with the participants, it was evident that the nursing educators did not receive in-depth faculty development opportunities to support their transition to virtual simulation and debriefing. With the addition of new simulation technology, it is essential for the onus of teaching not to be put on the technology but to utilize it to facilitate learning (Bailey, 2019). To use simulation technology as a tool, the educators need to have the appropriate opportunities to familiarize themselves with the vSim for Nursing™ to develop skills to extract the proper information from the virtual simulation to make debriefing a meaningful experience. The Healthcare Simulation Standards of Best Practice (2021) suggests that facilitators must

acquaint themselves with all aspects of the intended simulation-based education (SBE). Thus, a future consideration for this program may be to allot time for faculty development before starting any debriefing with students and to include opportunities to familiarize themselves with the virtual simulation program before the debriefing. Completing the virtual simulation before debriefing would allow educators to set the stage for learning and deepen their understanding of the pedagogical implications of the debriefing. Not enough considerations are given to supporting faculty on best adapting the format of previous teaching materials and assessments for delivery in the virtual learning environment (Foronda et al., 2014). Virtual simulation as a teaching modality adds a distinctive aspect to distance education in nursing. It requires both education on using the simulation program and facilitating effective debriefing. Although the educators in this study did not require specialized training, they felt challenged by a drastic shift in their virtual classrooms; thus, improvement to the instructional design should be considered for the future.

In the interviews, one of the topics explained was that educators were unaware of how the vSim for Nursing™ program worked and how it would be different from what they had done before, making it difficult for them to obtain a high standard of learning. Edgar (2017) suggests that a precursor to high-level learning occurring in simulation training is assisting educators in focusing on different aspects of each simulation to achieve the learning outcomes. Without specialized training on scaffolding for learning in a particular area, educators likely keep repeating the same process due to a lack of awareness.

Linking to the Simulation Framework

The NLN Jeffries Simulation Framework (2016) includes the context, background, design, educational practices, simulation experience, and outcomes. Simulation design includes

learning objectives and strategies for debriefing. The connection between the design of virtual simulation, the context in which it takes place, and how the debriefing is facilitated is instrumental in supporting students to achieve the learning objectives. Simulation design, faculty education and student outcomes are not separate entities; they are interwoven and share a co-dependent relationship; for example, if the simulation design is affected, so are faculty education and student outcomes. On the premise that the exponential increase in virtual simulation has significantly affected the simulation design, it would affect the strategies for debriefing and the educational practices needed to support students in achieving the learning outcomes. For example, educational practices include collaboration and time on task. However, in virtual simulation, where the simulation is done asynchronously, students are unaware of how others experienced the simulation, so the time on task and collaborative conversation may require more diverse strategies to engage everyone in the debriefing. The NLN Jeffries Simulation Framework (2016) recognizes diverse learning and high expectations as critical educational practices influencing simulation outcomes and design. The aspect of active learning and engagement in an online environment with distractions affect those educational practices. Having inadequate faculty development opportunities interrupts the ability of nursing educators to support students in meeting the outcomes in a way that optimizes the use of the technology. One of the critical risks of adding educational technology in simulation debriefing is that technology can create students' learning barriers, increasing anxiety and frustration (Foronda et al., 2020). Since VS requires technology, an orientation to the technology should be included as a preparatory activity. Another aspect affected by the use of technology and the change in simulation design characteristics is educator competency. Suppose educators cannot use the technology properly or debrief in an online setting. In that case, this can negatively impact the trust between the educator

and the student. Cowperthwait (2020) discusses that the NLN Jeffries Simulation Framework plays a pivotal role in recognizing that debriefing in an environment of trust makes the simulation experience learner-centric, pragmatic, and collaborative. Thus, without the opportunities to learn the skills needed for virtual simulation debriefing, educators may not feel competent in supporting students, which negatively affects trust-building and their ability to help students meet learning outcomes. There is the significant importance of building facilitator and participant interaction for positive learning outcomes during the simulation experience, which cannot be done without professional development and training (Jeffries et al., 2016).

Research Question 2

How do debriefing strategies in the virtual environment compare to in-person debriefing to achieve the intended learning objectives?

Theme 2: Experiences and Challenges of Debriefing

Experiences play a crucial role in phenomenology as the approach allows the knowers of the phenomenon to recall their perceptions and think about their lifeworld. Heidegger (1988) explains the lifeworld as the individuals' realities perpetually influenced by the world in which they live. Consequently, to better understand the experiences of nurse educators in an online setting, the participants were asked to describe how online and in-person debriefing differed. Sentences were coded to *experiences* when participants said or implied that they were speaking about their personal experiences. The participants were explicitly asked about the differences between online debriefing and their experience with in-person debriefing. While the question was about *differences*, six out of seven participants focused on challenges in the online environment. The consistent focus on challenges suggests that the swift transition to virtual

simulation and debriefing presented complex difficulties that should be addressed for program improvements.

One of the significant differences between the in-person and online debriefing was that the increased class sizes made it exceptionally challenging to mark the vSim for Nursing™ before debriefing and to discuss individual simulation experiences. It was apparent that the lack of non-verbal communication coupled with multitasking in the online environment posed the predicament of engagement and participation in the debriefing. For example, regarding the in-person versus online debriefing,

> P6: The most significant difference was the combination of the size of the group and the ability to read verbal and nonverbal communication. But online, nonverbal is very difficult. I was working with a group of students for who I was responsible for providing them with their clinical learning. So that it makes a significant difference, and I don't know how impactful it was. Our virtual debriefing was with a group of 15 or 16 people, and everyone did it independently and then came back together to discuss it. The ability to draw out common themes and how folks participate sometimes didn't work as well. I have some skills in this area, and it's very challenging to create an environment where all are engaged and actively participating. There was no additional time for this.

As INACSL (2016) recommended, faculty-led debriefing is a vital aspect of virtual simulation learning; it should be conducted one-on-one or with groups of students not exceeding a pre-set student-to-faculty ratio to maintain participants' confidence, confidentiality, and trust. INACSL and the National League of Nurses (NLN) (2015) suggest having a maximum of 10 students per session as more students limit participation, which is the precursor to deep learning and increases the probability of it transferring to clinical practice.

One participant explained in great detail how problematic this was to do this in two hours on a bi-weekly basis, stating that it compromised the quality of learning. For example, P3 explained, “Like, you want to do the virtual debriefing, but we also must tackle the real-life experience they’re having.” Consequently, the participants felt that the debriefing needed to be cut short because they still needed time to discuss their experiences in the clinical setting.

Participants explained that in person, in a physical classroom, there are fewer issues of connectivity and or people leaving in the middle of the class. P2 said, “If a person leaves a room, it is evident; however, online, it is less obvious, and people simultaneously come in and out of the sessions.” Participants noted that there was less multitasking with in-person debriefing, and if students did have questions, the whole group would stop and listen so they could respond appropriately. It was apparent among the participants that managing the technology simultaneously while teaching in such a new way affected the learner engagement and the instructor's cohesive flow throughout the discussion. Multiple participants explained that in-person debriefing made it easier to detect whether students were engaged and if not, they could pull them back in. Whereas online, it was more challenging to know whether students were engaged or understood the content because there was no control over the external environment in the way that in-person does. Participants did note that even though most students had their cameras on, they had difficulty reading body language and non-verbal cues; hence, the educators had to be “hyper-alert,” as described by one participant. In addition, the larger group combined with the aspect of the camera in the online setting may affect the trust and psychological safety of students to be actively engaged.

As the participants explained their experiences, it appeared that the multi-tasking of using technology and the skill of asking the right questions was challenging and possibly an area to

focus on faculty development. The explanation of experiences solidifies that online debriefing is distinctly different from in-person debriefing, not only in communication but also in asking questions that make the scenarios relevant to their practice. Another participant who was trained in specialized simulation education and who had facilitated debriefing for many years described that it was not easy having to think how they would ask a question in a way that would give the students a meaningful response. For example, regarding online debriefing,

> P6: I had to, as did all the other faculty advisors, had to find ways to make it super relevant at the moment. So, I had to think carefully about facilitation around what questions or curiosities would trigger a thoughtful, reflective response.

P3 further echoed the sentiment of multitasking in the classroom; when either themselves or students were disconnected for any reason, it was disruptive, meaning there was a constant need to re-engage them. Again, it appears that in-person simulation debriefing made it easier to identify when students became distracted; managing student engagement while adjusting educational practices proved to be more challenging online.

Participants 2 and 3's experiences provided insight into why online simulation and debriefing have distinctly different group dynamics and challenges. Supporting the development of knowledge and skills without the kinesthetic value of psychomotor practice was complex and warranted more professional development opportunities. It was clear that educators with extensive experience and specialized training in simulation, full-time or part-time, still faced challenges in the debriefing. Consequently, this emphasizes the importance of a learning needs assessment and professional development opportunities for all faculty members using VS regardless of experience or employment status.

Personal Reflection. *On reflection, even educators who had been very experienced and trained in simulation found it challenging, so it must have been even more challenging for the faculty advisors who did not have any specific SBE. Their experiences resonated with me as I recall that I had similar challenges of learning how to distill the correct information for VS to make the debriefing relevant in such a large group.*

In the online debriefing environment, several barriers to open communication and conveying emotion exist. Cheng (2020) explained that psychological safety is critical; however, implicit contributions are limited. For instance, educators have no physical debriefing room to arrange seating, appearance, and privacy. In addition, computer interfaces affect non-verbal cues such as facial expressions and eye contact (Cheng, 2020). Non-verbal communication is critically important to a humanistic profession like nursing as it conveys empathy or provides validation; evidently, more challenging for educators in the online environment.

Next, looking at the virtual simulation, one participant explained the issue of cognitive overload.

> P5: I had a couple of students who I knew that they were going in and just doing those [vSim for Nursing™] in one day, which were the maternal-child or mental health ones; and so, that's fine, they're very broad; but I do think that they are shortchanging their learning by doing it that way, by taking that approach to it; they’re just doing it to get it done.

In regards to professional development,

> P3: There was so little PD teacher time; there was no quality. And to be honest, they knew they could get through the whole semester and year, in a Year 4 program, just because you got 48 out of 50 and most of them did that [the bare minimum of work to get

by], and that's the sims [vSim for Nursing™]. I didn't have confidence in my knowledge of their clinical expertise, right, because students are very clever with technology.

When the simulation modality changes, in this case, using virtual simulation, the instructional design needs to consider the online environment and how the SBE affects cognitive engagement (Bailey, 2019). By recognizing that technology and the critical thinking involved in completing the virtual simulation, the instructional designers should consider the student's cognitive load. Requiring students to do too many simulations can negatively influence the critical thinking and reflection required for their nursing practice (Pawar et al., 2018). Furthermore, the participants' experiences demonstrated that in-person best practices were not applicable for the online environment and thus acknowledged the importance of future program iterations that integrate the Healthcare Simulation Standards of Best Practice (2021).

Classroom Management and Instructional Design

It is a well-established fact that instructional design is built on the foundations of learning theories and pedagogy to guide the process of creation, implementation, and evaluation. Specifically, instructional design theories are critically essential to provide information about strategies, context, and learner individualities for improved integration (Reigeluth & Carr-Chellman, 2009). Most notably, instructional design theory supports a reliable prediction of the effectiveness of the instructional strategy (Al Mamun et al., 2020). Furthermore, by creating programs rooted in learning theories, educational institutions have a more systematic map to plan activities that support desired changes (Sharif & Cho, 2015).

Given that this virtual simulation is a new part of the nursing program, multiple iterations and feedback are a natural part of changing the design of the program. Foronda et al. (2020) explained that the evaluations of VS implementation in program design and nursing academia

are scarce and require more research to contribute to the literature on this emerging technology. Historically, the ADDIE (analyze, design, development, implementation, and evaluation) model was used as it included the foundational elements of instructional design. However, the Successive Approximation Model (SAM) simplifies the process and is explicitly designed to elicit feedback and build working models earlier in the process (Allen & Sites, 2012). Through applying the SAM model, feedback surrounding the needs of educators, what works and what does not, can be gathered early on instead of waiting until a summative evaluation (Jung et al., 2019). COVID-19 called for nursing programs to make a rapid and disruptive transition to the online environment in a short amount of time. Given the circumstances, the nursing program in this study pivoted and successfully moved the course online. However, Dreifuerst et al. (2021) explain that the rapid conversion of distance learning is concerning due to a lack of meaningful debriefing. So, examining educators' experience in hindsight offers valuable insight into program improvement, and faculty needs to address the issue of creating meaningful learning experiences. The SAM model is composed of phases of preparation, iterative design, and iterative development; it recognizes the recursive nature of course development and more rapidly develops the program (Allen & Sites, 2012). The multiple iterations of different phases in the course design plan would allow the nursing program to be more flexible and adjust according to the needs of people that work within that system. Especially with the new integration of virtual simulation technology, the SAM model may support educators to modify their techniques according to experiences and theory to create a more contextually situated program (Jung et al., 2019). Evidently, during program planning, careful consideration should be given to the instructional design to support simulation outcomes without neglecting the foundational underpinnings of distance education.

As participants explained their experiences of virtual simulation debriefing, the topic of online challenges was a principal focus.

The participants' emphasis on difficulties demonstrates the inherent perception of their experience with virtual debriefing to be challenging. In the past virtual debriefing has been regarded as the same as online teaching without recognizing the uniqueness of online simulation-based education. However, educators who already had online teaching experience focused so heavily on challenges determined that not all debriefing is created equal. Furthermore, there are substantial differences between online teaching and online debriefing (Foronda et al., 2014).

Participants had varying answers when asked about online and in-person simulation debriefing differences. All participants expressed that online debriefing required more multi-tasking by the instructor, such as managing the chat in Zoom, looking to see if the students were distracted, and managing webcam and connectivity issues. Two of the seven participants said they preferred in-person debriefing due to the nature of the multi-tasking and the steep learning curve they experienced as they had not been taught like that. A third of participants stated that they preferred online debriefing once they got used to managing the online classroom. Whether they preferred online or in-person debriefing, the commonality was the impact and challenge of learning something new. Hence, this suggests that faculty using VS debriefing required support in using the software/educational technology and skills in facilitating the debriefing.

One of the technical issues mentioned was that simulation did not have one of the critical cornerstones of debriefing, such as video playback, making it harder to focus on specific actions as they unfolded in the simulation. In addition, one participant noted that in-person student engagement was difficult because some students were reluctant to participate, possibly because

they were shy or intimidated; the asynchronous VS allowed them to feel more comfortable and more engaged in the online debriefing.

Conducting a debriefing online and managing technical issues concurrently was challenging. For example, Participant 3 said, “it was challenging to be engaged in the conversation, making sure everyone participates and monitoring the chat at the same time.” An ongoing thread in the conversation was the high number of students, classroom management, and learning to use a new teaching modality compounded the challenges for the educators. When conducting virtual simulation training, it is necessary to include knowledgeable human resources (Rim & Shin, 2021). The nurse educators need to have more than the skill of understanding VS technology but the competence of modulating and assessing learners' responses during simulation and debriefing (Cook, 2012). Furthermore, experience and integrating the lessons from VS are required to increase learners' affordance and engagement (Turchet, 2015).

If students completed the VS previously at the beginning of the week and another student completed the day before class, it meant at the beginning of the debriefing; they had to spend some time reviewing the scenario itself so students could recall the simulation and discuss the clinical action and rationale. Participants continued to discuss that since the VS could be completed so close to debriefing, it left them very little time to view the student’s results. So, from an instructional point of view, they were less prepared to manage their classrooms effectively without a thorough understanding of everyone’s needs. Therefore, the program's instructional design may benefit by considering time spent on tasks and the time between the VS completion and the debriefing. Foronda (2020) explained that debriefing is the most effective, and students have better memory recall when the debriefing is done as close to the simulation as possible.

With regard to classroom management, the participants explained that distractions in the online environment affected learner engagement in the debriefing and with other students. Accordingly, learner engagement is imperative to facilitating dynamic and relevant learning experiences. Based on the nurse educators' experiences, online debriefing using virtual simulation introduced many new elements simultaneously, including the software, learning how to understand the grades and managing an online environment, and ultimately it affected the debriefing quality.

Consequently, the addition of VS significantly affects the simulation design, including the debriefing. The NLN Jeffries Simulation Framework (2016) illustrates that the simulation design is connected to the teacher, student, and educational practices and can adversely affect knowledge development and critical thinking skills if all areas are not adapted to the change. If the goal of virtual simulation is to better prepare students for the clinical setting through improved critical thinking and skill acquisition, not adjusting connected aspects of the framework can be counterproductive for achieving those goals. Furthermore, the participants' description of classroom management experiences warrants greater importance on faculty development, allowing the educators to utilize more diverse strategies to engage learners. Wild et al. (2020) explained that to transition debriefing to an online environment successfully, faculty development needs to align with the changes in design and use of technology. High-quality professional development involves a thorough needs assessment to ascertain whether they have the skills, knowledge, and space for virtual teaching and learning (Wild et al., 2020).

It was evident that the classroom management proved problematic to engage students in the conversation and to navigate a larger group through debriefing in a meaningful way for them and practice. For example, Participant 3 explained, "yes, sure, we could go over the scenario and

the right answer, but that's not really the point of debriefing; they need to understand why they are doing what they do and how it affects their practice." When discussing classroom management, one participant explained,

> P2: I think the whole idea is, adapt, adapt to change; that's going to be our route to success. So, I think that, although it may be more comforting to look at someone, right in the face, to be able to talk to them and initially, I believe you get a better sense of who they are, who you're dealing with it's easier. I think that, if you have the right attitude, you can adapt [how] you can get to know them [the people whom you are dealing with]. But I think the secret to that is also zooming in on talking one-to-one at some point in time, talking to them one-to-one, face to face, so you can put a name to that face. Because when all 15 of them are up there on the screen for two hours every two weeks, that's not enough.

One of the most significant challenges identified by multiple participants included having to go into the vSim for Nursing™ program to find out if students had completed scenarios by the due dates, which was very tedious, especially since not all students had to complete the same amount of simulations. For example, some students had to complete 40 over the semester, and some had to complete 10. Participants pointed out that checking the vSim for Nursing™ took much longer than their compensated teaching time, and looking at due dates was only a small portion of understanding the totality of the vSim for Nursing™. Participants stated that the increased online workload made them feel incompetent despite many years of experience.

There was no additional time allotted for this. One participant explained how challenging it was to do this in two hours on a bi-weekly basis, stating that it compromises learning quality, especially given the lack of structure.

Based on the participants' experience, one of the challenges was that the initial instructional design of the in-person debriefing was transferred to the online setting without considering the nuances of virtual debriefing and that they were now asynchronous. Applying in-classroom practices such as simulation debriefing in an online environment without making any adjustments is an ineffective way to teach online (Kononowicz et al., 2019). As we live, learn, and work in a global market, the shift to technology is inevitable; however, there is a significant difference between a shift and a supported shift. Virtual simulation debriefing requires an instructional design that supports meaningful virtual learning transitioning from in-person to virtual debriefings. Applying the instructional design of in-person debriefing to the online setting can cause educators to compromise the debriefing quality. Educators can feel isolated and alone without the necessary resources, including accommodating the extra time required for virtual simulation. One of the critical factors underlying instructional design in the online environment is recognizing the role of educator presence and how it is affected in the online environment. As the participants explained, debriefing in a different environment and incorporating educational technology requires skills to engage students without compromising the teaching, cognitive, and social presences in online learning (Garrison, 2013). Cheng et al. (2020) explained that the instructional design of virtual simulation education should be conscious of the changes in structure and content delivery, how educators can guide discussions, share personal meaning, seek consensus, and summarize key aspects of the simulation. Therefore, the instructional design within a nursing program should consider aligning with the changes that accompany virtual simulation and the educator's needs to support a reflective discourse. Cheng et al. (2020) suggest that co-facilitation strategies with another educator can assist with cross-monitoring, knowledge sharing and management of frustrated or upset learners. It was evident that classroom

management of distractions in the online environment was challenging; one of the strategies for online debriefing is to clearly explain the goals and process to familiarize learners with the online learning environment, confidentiality and privacy, and minimize interruptions (Gordon, 2017). Understanding expectations is a fundamental part of simulation debriefing, especially in the online environment; both educators and students must be aware of each other. Consequently, part of the program planning at this school may consider creating specific guidelines and opportunities for educators can discuss before the simulation, further contributing to consistency and standardization of expectations.

As pandemic restrictions to in-person clinical experiences ease, it begs the question of whether faculty development for virtual simulation debriefing is worth the investment. Is the need for virtual simulation and debriefing going to be less relevant? The Canadian Schools of Nursing (CASN) (2021) developed a 26-question survey to assess how many schools used VS before the pandemic and how many stopped using it. They found that 36% of participants responded that their nursing program did not use VS before COVID-19, and only 0.6% of participants reported that their nursing program did not use VS post-COVID-19. The data presented by CASN demonstrated that the pandemic was not the only precipitating factor initiating the use of VS; there were other reasons for the use of virtual simulation, which furthers it as a complementary practice even after a pandemic. More research about the use of VS and the integration of INACSL's (2021) best practices is needed to provide valuable information for the instructional design of nursing programs.

Lack of Faculty Development

Nurse educators require pedagogical approaches beyond conventional methods to facilitate student learning to practice in complex health care settings. However, the inequities of

faculty development opportunities between adjunct and full-time nurse educators are stark. Although faculty development was previously explained in the context of online training, a central cross-sectional theme emerged to answer Research Question 1 regarding training and Research Question 2, which asked participants about their experiences with in-person and online debriefing. One of the most significant subthemes was faculty development; all participants explained training and development as a challenge, regardless of years of experience in teaching in a nursing program. Even though everyone had explained challenges, it is essential to recognize that the ongoing theme was that faculty had the desire and willingness to learn and engage in mentorship activities. Consequently, there is a need to marry the use of new simulation technology with the art of debriefing.

> **Personal Reflection.** *As I reflected on my discussion with the participants about wanting to learn together, it deeply resonates with me not just as a VS facilitator but also as a junior faculty member who had not known anyone in the group. My role as an educator is a constant cycle of shifting between being the teacher and being the learner. So, the desire to build connections and share knowledge is not limited to simulation but is universal to teaching and learning alike. Just as I strive to take a constructivist approach to debrief by framing experiences and using questioning to support meaning-making for the learner, when I shift into the learner role, I'm taking my own experiences and combining them with my new knowledge from debriefing to make it meaningful to me. As a result, whether I'm in the phase of a teacher or a learner, setting the stage for meaningful experiences is always my reality. So, for me, Heidegger's philosophy about phenomenology is right; I don't ever step out of my lifeworld.*

Phillips (2021) explained that the one mistake that is repeatedly made in nursing schools is purchasing equipment without considering the pedagogy required to integrate technology into the curriculum successfully. Without the knowledge and skill development needed to improve educator competency, simulation learning reduces the outcome of reflective learners who are equipped to make thoughtful clinical judgements. Smart et al. (2018) pointed out that educators feel less engaged and committed to the program and institutions due to the lack of faculty education and tools needed for integration. Ultimately, less educational support furthers the growing issue of nursing faculty shortages and resources for students (Phillips, 2021).

Multiple participants recognized that the "hint" sheet provided by the vendor was ambiguous. It didn't offer how to go through the debriefing or follow up; it was general questions to ask. For example, Participant 4 said, "The thing is that the hint sheets are so vague, it doesn't tell you how to narrow in or sequence the questions." Hence, the critical point is that simply disseminating information is not enough to develop high-quality debriefing. High-quality teaching and learning require programs to have systems in place to understand the needs of the educators and provide opportunities for knowledge acquisition and continuous feedback. Though the addition of new technological opportunities can bring about immense benefits, the lack of faculty development can make it burdensome to manage and coordinate resources needed to orchestrate complex learning (Munoz-Cristobal et al., 2014). Virtual simulation debriefing training needs to expand faculty development opportunities to encompass technological know-how and online classroom management underpinned by pedagogy to improve simulation outcomes of clinical judgment (Verkuyl et al., 2020). When nursing educators do not have the support and resources to effectively teach and facilitate a debriefing, it can profoundly affect

their confidence in their teaching and sense of self. Participants who had years of clinical nursing and teaching experience described their encounters in a very eye-opening way, for example,

> P4: I remember being teary because counting the sims [vSim for Nursing™] scores and matching them all up felt like I was two years old…. I don't feel that I gave the students a good experience; that's my biggest thing; I really don't think I did my best.
>
> P3: And also, like, on the other side of it, it's like I was learning too; basically, I felt like we were learning a brand-new way to teach, right, and, and I'm not a teacher, I'm a nurse.

Understanding educator experiences with online teaching, self-efficacy, and social-emotional learning are critically important to identify strategies to prevent compassion fatigue (Yang, 2021). The educator responses demonstrated that the lack of support to build competency using the vSim for Nursing™ and debriefing affected their self-efficacy and emotional well-being. A study of 321 distance educators examined perceived online teaching self-efficacy and social and emotional learning (SEL); the results concluded there was a negative association between online teaching self-efficacy and compassion fatigue. Furthermore, the findings emphasize the significance of fostering an educator's self-efficacy as a means to mitigate compassion fatigue (Yang, 2021).

> **Personal reflection:** *As I reflected on that conversation, I wonder if the lack of faculty development has contributed to self-identify? Even though the participant is in an instructional role for students in a Year 4 program, why did they not see themselves as a teacher? This was an essential part of the conversation for two reasons. First, the lack of support for educators to develop their skills deeply affects their sense of self; without special training in adult learning, there is less opportunity for transformation from being*

a nurse to being a nurse educator. Second, the nursing experience needs to be recognized as different from teaching.

Based on my interaction with the participants, it became clear that there is an assumption that because a person has been a nurse for a long time, this automatically translates to being able to teach when in actuality, both aspects need to be nurtured through education and development. Assuming that nursing experience is the same as teaching experience further perpetuates the problems of debriefing and virtual simulation debriefing, all being seen as interchangeable when they are separate entities. In line with this thinking, P3 stated, "I do my best, try to give them a little here. But I don't think that's the best way. I think we can do a better job of that as professionals; we owe it to them.". Hence, the instructors recognize their potential to be or do better. However, their reflection on their practice demonstrated that it was not optimal.

Participants explained that engagement was a significant challenge. For instance,

P6: I guess I would say that the biggest [challenge] was engagement because it's sometimes the most tangible evidence we have of learning by the degree of engagement. It's not always talking that demonstrates engagement. It's the body language and how interested they look. So that was it. It was a challenge in that environment.

Furthermore, debriefing in the online environment required more skills. Therefore, effective training depends on educational outputs and requires qualifications, skills, behaviours, professional development, and research. In this respect, the role of the competent instructor is highly significant to support learning in a new environment (Harris, 2018).

Time and Compensation

The educators in this study had vastly different clinical and teaching experiences. Due to the lack of preparatory time, participants felt less competent navigating the vSim for Nursing™

software and planning the discussion for the frame of two hours, which had not changed from before COVID-19. For example, Participant 3 explained that “there was an uproar about workload and, honestly, to keep on top of it, you had to do it every week, or you would just fall behind.” Similarly, Participant 4 explained, “because the workload became so overwhelming, some instructors gave students the marks because we had less time to go through each case.” Two participants noted that the extra work was done outside of paid teaching time, so people may not have been as diligent in checking the completion and student results with few hours allotted for teaching. It appears that the lack of compensation for their time may have affected the quality of their work. Not recognizing the additional time it takes for educators to prepare for debriefing, translated to them feeling underappreciated. For example, Participant 4 explained, “I mean, again, I'm not trying to nickel and dime, but you were asking me to do a lot of extra work with no significant compensation, like not even a thank you.” Another example was,

> P5: They pared back the contract hours so much and added so many students for each person's group. All we were really were expected to do was go into the database, make sure they did the pre-test, make sure they did the vSim for Nursing™ and they got a certain mark on it, and make sure that they posted that, and that was all. And I found that that was a very reductionist approach to the value of the institution and educators. I felt that this because the university was very vocal about how much money it costs, and, you know, I'm sure it did. However, not paying the teachers for the time they need to go in and make sure it's a quality experience for the students was very unfortunate.

The participant highlighted an essential point of choosing quality over quantity regarding instructor responsibilities. It further warrants re-assessing how the educator's role in the online

environment changes in workload and time; it cannot be based on in-person simulation hours because the roles and responsibilities are different.

Personal Reflection. *Learning is very individualized; students are diverse in their thinking, growth and needs. Having double the students who all go through simulation independently means that there are 14 different people with 14 different experiences. So, in the same time frame, how could you understand everyone's experience any deeper than just scratching the surface? Even if two students make the same decision in the simulation, not exploring the rationale for why they made that decision can significantly affect their clinical practice. As an educator, I want that time to pause with students, listen, and hear them discuss why they made those decisions and assess whether they understand the implications of the clinical action. I reflected on the less obvious but important part of the conversation: how the lack of professional development made people feel. This group of people were established, knowledgeable, and had years of experience, yet not providing them with the opportunities to develop the depth and breadth of knowledge required to do something well was disheartening. It became clear that the lack of professional development profoundly affected the educators' sense of self. I learned that professional development goes much further than gaining clinical skills; it is also about self-esteem and confidence that comes from it.*

Stepping back and looking at the overall trend of the findings, it was apparent that most participants focused on *challenges* in the interviews. However, two participants had more coded units to challenges than others; for example, Participant 1 had 181 coded units related to challenges, whereas Participant 6 had 74 coded units to that parent code. When looking at each participant's background, it was evident that Participant 1 had significant managerial experience

and Participant 6 had leadership experience but also had specific simulation training. The wide range of variability with the codes demonstrates that facilitators have unique learning needs and perceptions of challenges. For example, Participant 1 felt that the debriefing was needed to help students think about patient care and how to function professionally in the workplace, which was challenging for them. Participant 1 recognized that it was hard to facilitate the debriefing to have them think "outside the walls of simulation". This participant consistently drew reference to their experience in the hospital with managing new graduate nurses. It was evident that Participant 1 saw that students needed more support around critical thinking and professional development knowledge, so fostering those qualities in debriefing required more time and skill. On the other hand, Participant 6 explained challenges differently, not referencing the management of new graduate nurses but more about relevance and clinical skills. So, when looking at the variability between what these two participants perceived as challenging, it was apparent that a person's experience is a vital part of how they see challenges and approach the debriefing. Thus, recognizing that not all experience is the same and educators have different needs demonstrates the significance of standardizing VS professional development opportunities and competencies. High-quality professional development cannot be achieved without understanding the unique needs of facilitators; this requires a thorough learning needs assessment, a tailored approach to knowledge acquisition and a method of evaluating learning. Accordingly, INACSL's (2021) HSSOBP, Professional Development includes an educational needs assessment, participation in professional development activities, and revaluation.

Theme 3: Benefits and Opportunities of Virtual Simulation and Debriefing

Despite the challenges of VS that participants expressed, they also described benefits that contributed to the university's program and nursing education overall. For example, participants

said that during the pandemic, students felt worried that they would not graduate on time, and the use of virtual simulation supported them in meeting the course outcomes in time. For example, Participant 4 said, “It's extremely important to acknowledge the importance of technology, because in the context of a pandemic, you know, we wouldn't have had it any other way or those students would have lost the whole year.”

As the COVID-19 pandemic significantly reduced the number of students allowed into health agencies in person, virtual simulation offered an alternative and complementary learning modality for students to get real learning experiences safely (Wild et al., 2020). In addition, there are other reasons such as illness, staff shortages, or hospital closures that may prevent students from graduating if they miss clinical opportunities, so VS will continue to be relevant after a pandemic (Atthill et al., 2021).

Accessibility and Contingency Planning

Multiple participants approached the topic of virtual simulation benefits from an instructional perspective. For context, before COVID-19, the faculty advisor would visit students at the clinical placement, often on their own time and sometimes far from their homes. Thus, the improved accessibility to education was beneficial to students and educators alike as they could more efficiently collaborate with students and their preceptors. One of the central aspects that the participants explained was that the pandemic was only one of many reasons students could not attend clinical placement; other reasons included a disease outbreak or illness, then the student would miss clinical practice. So, as the virtual simulation was done asynchronously, it allowed students to have flexibility in completing their simulations.

Personal Reflection. *Virtual simulation can be synergistic with in-person clinical learning. With that being said, the virtual simulation event is only part of experiential*

learning, and time for debriefing should also be regarded as part of the clinical time. One possible suggestion is that the virtual simulations should not be assigned for the full 11.25 hours but instead for fewer hours to allow time for debriefing.

Knowledge Development and Mastery

One of the most predominant benefits explained was exposure to various clinical scenarios and specialties. The participants explained that their students were excited to care for the virtual patients in the simulation program, especially for the specialty areas such as pediatrics. As explained, specialty areas for students to be placed clinically are very few. Consequently, students tend to be anxious about not having had exposure to specific patient populations and gaining the clinical skills to work in those areas. One participant confirmed that the students were concerned that they would enter the nursing field without caring for a particular type of patient. However, the students had many different virtual simulations, which let them experience what it would be like to care for a broad range of patient populations. For example, a student may not have cared for a pediatric patient, especially if their clinical placement was on an adult unit. If students are unclear or do not have the depth of knowledge to care for a specific patient population, it often goes unnoticed simply because there are few or no evaluative methods to assess their clinical practice in that area. Therefore, predetermined virtual simulation and debriefing expose students to a wider range of clinical scenarios, allowing them to reflect, ask questions, and construct meaning concerning their practice actions.

Most importantly, not only do students have an opportunity to care for virtual patients, but they could also access the vSim for Nursing™ repeatedly to practice their learning and reinforce new concepts. Almost half of the participants explained that a significant benefit of

virtual simulation repetition, skill mastery, and reflection is often what students need to truly grasp a new concept; however, in-person simulation typically does not allow for this.

> **Personal Reflection.** *I could see that repetition and reflection were imperative for students to deduct the most meaningful learning. It appeared to me that instructor-led debriefing after virtual simulation allowed for students to have the continuity of learning and mastery through the means of reflection.*

Reflection is an active and emotional process that cultivates learning by building on past experiences to create new knowledge. Schön (1983) described reflection as in-action and reflection-on-action; in-action is the evaluation of self that students do during the SBE. However, reflection-on-action is the evaluation of an experience after it is completed. Furthermore, debriefing supports a systematic approach to help learners bring new understanding and meaning to the learner's practice. The new learning and understanding gained through reflection are the building blocks of knowledge development that can be applied to future practice (Lapum et al., 2019).

Two of the participants mentioned that one valuable aspect of the virtual simulation and debriefing was that it assisted students in approaching very challenging or ethical situations that can be more difficult to do in real-life such as talking to an upset family member. For example, Participant 2 described the benefit of VS as: "the simulations help them put theory into practice before they do it with real patients, where the risk is much higher." Similarly,

> P1: I think it's [vSim for Nursing™ training] great; it's a great teaching tool for setting up like negative encounters with families, right, and in debriefing, you could ask, "Did that nurse respond appropriately?"

By exposing students to more clinical scenarios in which they can practice repeatedly, they are more likely to achieve skill mastery and knowledge retention (Fealy et al., 2019). Rourke (2020) determined that the use of VS can be used as an educational intervention for measurable improvement for skill mastery.

Research suggests skills are best learned when knowledge is actively constructed; hence, having the faculty advisor lecturing or simply reviewing the correct answers leads to students' learning becoming passive (CASN, 2020). Passive learning is less engaging than a debriefing that uses Socratic questioning; however, without the right development opportunities, virtual simulation debriefing is at risk of becoming passive as educators do not have the same skills to facilitate critical thinking in the same way.

> **Personal Reflection.** *On reflection, when the participants explained the student's fear of not having cared for a patient of a certain population, I could empathize with them as I have had students experience extreme anxiety before caring for specific patients, and I know fear can profoundly affect learning. As I thought more about the ability of VS to expose students to more areas of clinical practice, I also realized that there should be professional development opportunities for educators to review their knowledge in these areas. How could the educators understand how to support students to reflect and understand their clinical actions in a meaningful way unless they had the most up-to-date clinical knowledge themselves? Especially since students are anxious to learn about these unique experiences, it places even greater importance on debriefing to learn clinical judgement skills.*

To implement and optimize the use of virtual simulation-based learning, educators need to understand how to go from interpreting the student scores in the vSim for Nursing™ to

understanding how to use that information in the debriefing to support the course outcomes. Not providing faculty advisors with the skills to interpret the analytics of a student's score in vSim for Nursing™ and the techniques needed to translate that in the debriefing can decrease the debriefing quality and risk of not adequately preparing students for practice (Fealy et al., 2019).

Examination Preparation

When students graduate from the Bachelor of Science in Nursing (BScN) program, they must write a licensing exam to become a Registered Nurse. Hence, one of the program outcomes is to prepare students to pass the exam adequately; to do this, they write a pre-licensing exam. In terms of preparation, participants explained that virtual simulation better prepares the students to write the pre-licensing exams; Participant 4 said, “If I remember correctly when the VS was used, students scored higher than any other year on the exam.” One participant explained that part of this was due to the clarification around certain types of cases where students never had the opportunity to “be the nurse”; it was only content that they read in the textbook, so it was not contextual in the way that virtual simulation was. A study was conducted of 216 students comparing exam results between students who used virtual simulation or traditional lectures for learning (Kononowicz et al., 2019). The study results showed significantly higher marks in the virtual patient simulation group than the regular exam group (Kononowicz et al., 2019). The findings suggest that VS supports learning and assessment better than traditional assessment methods. Thus, as a complement to clinical practice, with the right design and faculty development opportunities, virtual simulation and debriefing can support students both in theory and practice through the use of safe, real-life clinical education.

Research Question 3

How can virtual simulation debriefing practices be improved and contribute to best practices?

Theme 4: Improvement and Contribution to Best Practice

The practice of nursing education is evolving; learners have become technologically savvy, meaning that institutions and faculty need to provide more interactive and immersive learning experiences for them. INACSL (2021) HSSOBP considers virtual simulation; however, more research is required to apply those practices in nursing programs and understand how they affect student and system outcomes. Although experiences are often overlooked in the implementation of technologies, educators' experiences have shed light on both practices that need improvement and successive ones. Examining virtual simulation debriefing experiences can help shape future iterations of instructional design to optimize the online learning experience. Foronda et al. (2020) explain that the varied context and modalities for VS and debriefing make it difficult to determine best practices for its use.

With the addition of VS, the educators needed to adapt their teaching strategies and debriefing to encourage student engagement in this new learning environment. The participants expressed that it was unrealistic to use the existing approach to debriefing because it is an entirely different environment with entirely different tools. Hence, the challenges were that adopting their teaching strategies without the guidance of best practices and adequate training on the technological tools made them feel confused. In addition, participants emphasized that the online environment requires additional incentives for students to participate and engage with colleagues and the course material. As a result, one of the suggestions for virtual simulation debriefing is to re-examine the course material and the pedagogical management of integrating technological tools.

Another issue that participants explained was that the implementation of the VS and guidelines for debriefing were unclear for both students and nurse educators. Especially with the

delivery of the course changing, expectations were ambiguous, which caused students and teachers to feel disorganized. Highly effective faculty development at all levels, including adjunct faculty, is non-existent and the wide range of expectations for faculty members with respect to service, research, and teaching further complicates the issue of changing program design (Hakkola et al., 2021). For instance,

> P5: I found that they introduced [vSim for Nursing™] in a very disorganized way for the students. And changing the date and the syllabus not lining up with the other part, you know that being disorganized like that from the university perspective, wasn't helpful.

Participant 4 explained, “Figuring things out on the fly didn’t help us to be organized or even to answer student questions.” The participant continued to say that leadership could have improved the course by thoroughly reviewing the syllabus changes before sending them to students and faculty. Not all of the program instructional designers work in the course being offered, however, they do work within the nursing program. In addition, virtual simulation can only be effective if the instructional designers determine the appropriate instructional theories and models in the learning environment (Hakkola et al., 2021). Finally, Participant 5 stated that “even though the sims [vSim for Nursing™] allowed the students to learn more about areas where they did not have a placement, like mental health, it [vSim for Nursing™ program] wasn't supported for success.”

Although it was identified that VS and debriefing offer the benefit of exposure to clinical scenarios, the debriefing was not optimized as participants felt that the design lacked proper preparation and a thorough review of the proposed changes. Furthermore, without meticulous planning and following a model and or design theory, the benefits of VS can get lost.

Although the SOBP (2016) debriefing was derived from in-person practice, there were still foundational pedagogical principles that could have been adapted to the virtual environment when the course was taught. For example, INACSL's SOBP at the time of the course development suggested that debriefing should be facilitated by a person(s) who can "dedicate concentrated attention during the simulation to debrief the simulation-based experience effectively" (INACSL Standards Committee, 2016, p. S22). Although the standard was based on in-person synchronous simulation, and vSim for Nursing™ was done asynchronously, it demonstrates the importance of providing sufficient time for educators to be attentive to the entire simulation event and not only "observe" or extract parts of the simulation, like the simulation scores. Allowing adequate time for instructors to complete the debriefing and to grade the simulations relates to the ongoing challenge of a lack of preparation, training, and compensation. In addition, incorporating sufficient time for VS professional development is conducive to learning, trust, contemplation, feedback, and reflection (INACSL, 2016).

Over one-third of the participants raised the issue of not knowing what to ask in the debriefing since they were not with the student in the virtual simulation. The HSSOBP (2021) for debriefing suggests that "A proficient facilitator is required to manage the complexity of all simulation aspects'' (INACSL Standards Committee, 2021, SOBP (2016). Given that the debriefing is part of the simulation experience, for educators to be proficient facilitators, they need the opportunity to develop scaffolding skills and use Socratic questioning in the online debriefing. Debriefing is more complex than simply asking what went well and what did not. Harder (2011) explained the role of the instructor in simulation as comparable to an expert builder that is continuously assessing and building on underlying structures.

Similarly, the instructor has to know how to ‘‘scaffold’’ the clinical scenario while assessing the learning style and needs of the learners. The skill of scaffolding is complex because the instructor needs to know how to cue learners (step-in) and when to let the learner be more self-directed or “step-out” (Harder, 2011). Even if the faculty had some understanding and skill in Socratic questioning, the skills would still need to be further developed to consider the different contexts of virtual simulation and the online environment. Socratic questioning is a foundational aspect of simulation debriefing, both in-person and online; however, for asynchronous virtual simulation, the educator would need to learn how to question learners in a way that appeals to multiple individual experiences and learning styles (Al Mamun et al., 2020). In addition, it is imperative to consider that with virtual simulation debriefing, educators do not have control of the learner's physical environment in the same way they do in-person. For example, some learners are in shared spaces and may be uncomfortable discussing specific topics. One of the foundation principles of debriefing is providing learners with a psychologically safe environment. Thus, the program's instructional design needs to recognize the dynamics of learning collaboratively and how the role of a psychologically safe environment shapes the learner’s experience (Dale-tam et al., 2021). Accordingly, in an online setting with more variables in the environment, it may require more effort and skill to establish psychologically safe spaces (Dale-tam et al., 2021).

Regarding best practices for faculty development, one participant explained the instructional design and the process implementation. Based on the conversations, it appeared that the course leads who rolled out the new program were not the same people who specialized in simulation learning. The participants noted that perhaps there was a better way to use their resources as the institution is recognized as one of the leaders in simulation. In the context of my

study, the leadership team refers to course leads, academic coordinators and the program chair. An essential point about implementing the VS was that the leadership teams did not genuinely understand the faculty advisors (FA) experience.

> P5: So, I never understood why they didn't roll out to the simulation lab with them, especially their beautiful simulation lab, where they're very well organized. I don't know why, because that would have been the perfect place for us to get answers to our questions as well because some staff there are already very knowledgeable. Yeah, but instead, it rolled out to the course leads, who really knew nothing about the vSim for Nursing™, and knew nothing about debriefing, either, or, in fact, don't even carry a course load. Some of them, most yeah, it's different [course leads don't understand what faculty is going through with vsims [vSim for Nursing™ training]; being at a different level is not the same experience as the FA.

As I reflected on this point, I understood how vital collaboration and cohesiveness in an institution are. Although people had expert knowledge in simulation, working in a "silo" rather than stepping back and seeing the whole system and the people within it, we can miss opportunities to tap into our resources. In addition, when the participant explained that the course leads did not understand what they were going through, it may have negatively impacted the course's instructional design as it was overlooked, making it less contextually based. The design of SBE in the Year 4 program should explore the experiences of the people who are implementing and working within the system; otherwise, it is disconnected from contextual challenges and communicates a lack of empathy amongst team members.

Examining educator experiences, as done in this study, is crucial for the development of best practice guidelines. A potential consideration for improvement at this institution is that

course leads should be cross-trained in online simulation debriefing and the vSim for Nursing™ program itself, instead of having one person for each. For example,

> P4: I don't know if this is possible, but to have someone who knows both the technical sim stuff and the faculty advisor stuff, because we needed support in both, and we had to go to different people to get answers.

In this way, when educators need help, the mentor or course lead could provide support about the complexities of the software and how to utilize it effectively to meet the course outcomes.

Debriefing is an instrumental component of simulation design that support active learning, interaction and reflection guided the nursing educator. The NLN Jeffries Simulation Framework (2016) was chosen as the theoretical framework for this study as it includes seven critical aspects of simulation: context, design, simulation experience, background, facilitator and educational strategies, participant, and outcomes. Moreover, this study focuses on the simulation design aspect of the NLN Jeffries Simulation Framework as it supports the development of improved debriefing practices and instructional design.

Debriefing Framework Implementation. The updated HSSBP (2021) best practice guidelines for simulation and debriefing are relatively new and calls for more research in the area of virtual debriefing. Participants were asked if they were given any best practices or frameworks to facilitate the debriefing; six out of seven participants had never been formally introduced to a debriefing framework. Although the participants were not given the frameworks, they suggested that a framework would have been useful to support their ability to have a more structured and productive discussion.

It was apparent that the nursing educators were aware of the need for more direction about bridging the gap between the virtual simulation itself and facilitating a meaningful

debriefing. Participant 6, who had previous simulation training, was the only one to mention the Debriefing Assessment for Simulation in Healthcare (DASH) framework as a benefit not only to their teaching practice but also to students and the way they approached their practice. Participant 6said that taking a systematic approach of using a framework for debriefing models the systematic approach that nursing students need to take in their clinical practice. Although it was not explicitly developed for simulation, the framework was "embedded" in the way they approach debriefing as it had applicable aspects such as maintaining an engaging learning environment and organizing the debriefing. In addition, this participant focused the least on challenges compared to the other participants. Interestingly, the participant had the highest number of codes under benefits; these data may suggest that specialized debriefing practices may influence a person's ability to address challenges and problem solve effectively.

Virtual and in-person simulations have different contexts and environments; however, implementing a framework could support faculty to be better prepared to debrief and possibly cross-train for other areas as the skills may be transferable to different roles (Padilha et al., 2018). Doing so can increase the overall collective capital for the group and be beneficial to educators, students, and the institution in terms of contingency planning. One important note is that the implementation supports the educator in feeling more competent and prepared to teach; thus, educators are more motivated to engage in the conversation and create dynamic learning experiences actively. A qualitative study looked at virtual simulation debriefing in first-year nursing and found that instructional strategies such as the use of a debriefing framework and promoting safe debriefing spaces supported knowledge acquisition and reflection in learners (Prendergast, 2021). Concerning applying a framework to debriefing,

> P2: But I had that from the other courses, so nothing just for the vsims [vSim for Nursing™], which is a shame. The whole point of debriefing is to help the students be able to make clinical decisions. Still, it's hard to take a clinical judgement model and directly apply it to such a specific type of teaching and learning because it wasn't created just for simulation. But it does give you some ways that you can ask them questions.

One aspect of the conversations with the participants that stood out was that Tanner's (2006) Clinical Judgement Model (CJM) was being used in the nursing program. When the participants talked about using the CJM, it echoed the exact sentiment of why the instructional design for in-person debriefing cannot be entirely applied to the virtual setting without reassessing which areas are appropriate for VS.

One of the re-occurring challenges for online instruction in nursing and many other disciplines is creating courses that are conversions of their equivalent face-to-face counterparts. As distance education in nursing has grown exponentially, it is critical to consider how educational practices such as active learning, collaborative learning, project-based and situation learning have changed the nature of instruction. Further, transitioning a nursing course online should not utilize the educators as a vehicle to transfer information to students and expect them to demonstrate their learning on an exam. Smadi et al. (2019) suggest that to successfully design distance education courses in nursing, it needs to go beyond instruction as an information delivery method and look for innovative ways to facilitate quality teaching and learning. VS is being incorporated into distance education for nursing, so the implementation of a new course design needs to be done without "succumbing to the temptation to have online instruction become direct instantiations of traditional in-person instruction" (Smadi et al., 2019, p. 18)

Multiple participants explained that since the students completed the vSim for Nursing™ asynchronously, by the time it was debriefed with the educator, many other events had transpired, so the debriefing was often less engaging. In addition, since the vSim for Nursing™ is not captured in a video recording as an in-person simulation, it was difficult for the educator to focus on what decisions students were making or why they made each decision and essentially, critical decision-making can get overlooked. INACSL (2016) suggests that for programs that require asynchronous completion, a more realistic alternative would be to have students write reflective posts immediately following completion of each virtual simulation. Doing so better supports recalling their thoughts and reactions during the debriefing. One participant explained that students were to take notes after the simulation and bring them to class; however, many students did not do this, and if they did, the notes were very ambiguous, and there was no time for the faculty advisor to review this prior to the debriefing. Participants suggested that this could be improved by building in synchronous time where all students went into the VS and completed it closer to the time of debriefing; however, it also creates a challenge in giving the facilitator enough time to mark and identify trends. Regarding the debriefing being far from the actual simulation, one participant explained,

> P4: I just felt that there's maybe a little bit more disconnect, and it was difficult to do that debriefing when I wasn't present during the process of actually doing a [vSim for Nursing™] simulation with them.

One of the participants suggested having a designated person go into the VS to retrieve student marks and identify patterns in the areas that students needed support, but this may be difficult from an economic standpoint. One consideration may be to use a computer-generated analytics report, which could group the results and project trends in an accessible format for the

educators to understand easily. Participant 7 explained that it was hard to know what they were getting out of the VS as it was done separately from the FA.

The HSSOBP (2021) suggests that simulation debriefing should be planned and based on an evidence-based theoretical framework to harmonize the learning objectives and simulation outcomes (see Appendix E). Elkowitz (2021) explained that Socratic questioning or asking a series of questions provides an opportunity for learners to develop a deeper awareness of the limitations of their knowledge. The NLN Jeffries Simulation Framework (2016) demonstrates that an educator's training is not isolated from the simulation outcomes; there is a co-dependent relationship between faculty development and students' awareness and competency, which is reflected in the simulation outcomes. Learning in simulation happens primarily during debriefing. Consequently, all debriefing facilitators must be trained and use a debriefing framework to consistently meet the learning objectives (Cheng et al., 2014).

One of the major benefits of a framework for online debriefing is a more deliberate practice that supports educators in understanding how to pause and discuss to scaffold student learning based on the learning objectives. The quality of differentiated support for learning, or scaffolding, is paramount to the design and structure of successful online environments (Al Mamun, 2020). Eppich et al. (2015) explained that educators need to learn how to ‘rewind’ and practice skills in a meaningful way for what they are trying to achieve. A framework is not something that can be memorized but requires the professional development of the facilitator to employ the framework in different contexts. For example, certain types of simulations, such as resuscitation training, require repetitions with feedback, which may be different from teaching ethical decision-making (Hunt et al., 2015).

Eppich et al. (2015) suggested that faculty must keep informed about current research, receive training about debriefing, and find opportunities to practice their skills. The Center for Medical Simulation (n.d.) suggests various tools to support a structured debriefing and recommended the use of the Debriefing Assessment for Simulation in Healthcare as it offers different ways for faculty and students to provide feedback. Therefore, a possible area for developing best practices is choosing a framework for debriefing that best aligns with the curriculum and the needs of the learners.

Role Differentiation

INACSL (2016) recognized the need for simulation debriefing guidelines to support active simulation learning through design and development; nevertheless, virtual simulation debriefing may not have been entirely conceptualized when the standards were established (Gordon, 2017).

One of the subthemes identified under a potential best practice is having nurse educators who use VS as a teaching modality be recognized as a unique area of educational practice, whether full-time or part-time. Participants expressed that because they had been faculty advisors previously and had always done debriefing in-person or even online teaching for other classes, the school assumed that they just had to do the same thing in the online debriefing. In fact, the role of a VS debriefer required more complex skills of questioning and classroom management in the online setting. As the advisors recognized that classroom management and multitasking in the online environment were convoluted, the issue was compounded by adding the vSim for Nursing™ software. Multiple participants explained that since they had been a nurse for many years, it became harder they did not know because the assumption is that you will look incompetent. One participant made a critically important note that clinical nursing is different

from teaching nursing, and simulation debriefing should be the same. Virtual simulation debriefing is a growing part of the nursing curricula, which requires recognition and faculty development to support educators in building debriefing techniques designed to augment learning and heighten participant self-awareness and self-efficacy (INACSL Standards Committee, 2016).

Mentorship

Eppich et al. (2015) explained that there is excellent value when faculty receive feedback from other facilitators to improve their practice and deepen their understanding. The most highly suggested improvement for six out of seven participants was mentorship. The participants expressed their desire to communicate with other faculty more often in ways other than email or Zoom. One-third of the participants said that learning such a new concept as vSim for Nursing™ and virtual debriefing was isolating. There was no way of knowing whether you were going about the debriefing correctly. Thus, creating methods for faculty to build supportive relationships is critical to gaining a sense of community and self-efficacy.

It is a well-established fact that debriefing is intricately connected to the simulation experience. Therefore, it may be helpful to provide more mentorship and evaluation throughout the entire process, from interpreting the vSim for Nursing™ results to how it is translated to debriefing instead of only looking at the debriefing in isolation of the simulation event. Multiple participants said that when they did ask for help from the leadership team, they felt supported and that they were understanding of how difficult the situation was. Consequently, leadership support is a critically valuable aspect of program planning and contributes to building stronger resilience and a sense of colleagueship. For example, Participant 4 explained, “Yeah, so I think it's essential to have supportive colleagues and a leader that can answer your questions.”

One of the program's improvements could be having someone from the leadership team go through the VS and the debriefing process with the educator from start to finish to address issues that may arise. Having someone go through the vSim for Nursing™ in real-time and the debriefing may have helped the faculty advisor better understand their role and expectations. Another participant said they knew that many people ended up using a "buddy system" informally because they needed help to figure out how to do the debriefing and did not want to reach out to the leadership team every single time. Essentially, even though participants had access to email and other communication technologies, the lack of a structured system made people feel isolated. For example,

> P2: I went through that same phase that you need to buddy up with somebody. So, if you're a novice instructor or faculty advisor, you need to buddy with somebody else so that they can work with you and tap into your resources. When I started, I had to do that reaching out, which has helped me quite a bit. Even now, I do [reach out for help or support] if I need to. I have a support system, even a hub or something, where people can informally post or ask questions.

Participant 4 suggested, "Maybe make small groups or buddies so that people don't feel like they're going through it alone."

Consequently, an improvement in this program may be creating a way to allow pairs or small groups of nursing educators to interact more frequently and engage with educational resources before the start of the course as a part of prior learning assessment and recognition (PLAR) (Kardong-Edgren et al., 2019). Utilzing PLAR for faculty development supports the value of experiential learning in ones teaching practice both informally and formally (Shorey et al., 2019). In my study, the nursing educators had a vast array of clinical and teaching

experience, therefore, PLAR may contribute to recognizing the uniqueness and skills that they bring to the debriefing.

Another suggestion that came to the forefront in potential best practices was improving the support level for online faculty advisors. Participant 5 explained that in-person simulation had more support in terms of mentorship. The vSim for Nursing™ was even more challenging because not only was it new, but it was also compounded by the fact that you no longer had a team of people helping you. In-person, you also have a technologist who controls the technological aspects of fidelity, so essentially, in online debriefing, you are asking the faculty to take on three roles. Therefore, program improvement may consider reassessing the role of the nurse educator, considering how much support they have and create specific outcomes for their development in the online environment.

Although distance learning can improve accessibility, online teaching and virtual simulation debriefing remain an intimidating experience for educators (Baily, 2019). In addition, as funding for faculty was significantly decreased during the pandemic, having faculty act as leaders in their area of expertise may be a way to draw on their diverse skillset efficiently. The participants did discuss that they were willing to take additional courses; however, the institution should provide the necessary funding to competently fulfill their role as a faculty advisor leading a virtual debriefing. Two participants explained that there was still paid time and support for professional development available for full-time staff. It was apparent that professional development opportunities seemed to differ depending on an individual's employment status. Inequitable faculty development paired with a virtual debriefing that is not standardized may compromise the debriefing quality given the expectation for all faculty in the course to be knowledgeable and competent in this area. This begs the question, do faculty inequities translate

to inequitable opportunities for student learning in the simulation setting? So, although professional development may be complex during a pandemic, the institution may benefit from shifting its approach to faculty education to be more inclusive. Boyer's (1990) approach to faculty education recognizes that all the intellectual endeavours of faculty, informal and formal education, advising, and research are considered a valuable part of scholarship.

Furthermore, adjunct faculty should be considered scholars and given the same rights and support that full-time faculty receive. Virtual simulation debriefing is a new reality in distance education for nursing. Boyer's (1990) approach to faculty scholarship suggests that institutions need to expand their boundaries to be more inclusive of the lived experiences and consider the act of teaching itself as a means of scholarship that contributes to program growth. Capturing the sentiments of participants' experience is a crucial step towards change; by identifying inequities and power systems, it actively advocates for social justice and mentorship in their educational institutions.

Evaluation

Without having a method to understand what is expected of an educator, there are fewer opportunities to identify their learning needs, which diminishes motivation for faculty development and training (Gordon, 2019). For example, one of the expectations that three participants described was that there was no evaluation method of their teaching from the course leads, so essentially, they continued debriefing without feedback on improving and growing in their practice. Real-life examples of seeing someone in leadership lead the debriefing may facilitate and exponential growth in faculty knowledge development through formative evaluations during the term.

INACSL (2016) suggests that attending at least one debriefing session facilitated by another faculty member can support quality and consistency within the program. Another potential tool to help collaborative debriefing is implementing a framework specifically designed for debriefing. Furthermore, instructional design for future programs needs to broaden our horizons, look beyond nursing-specific expertise, and align distance and adult education pedagogy.

INACSL (2021) HSSOBP suggests that even if a debriefing model does not formally integrate the Socratic approach, the facilitator should incorporate the strategy of asking essential questions; they have recognized the DASH framework as one of those strategies. Therefore, one suggestion could be to use the Debriefing Assessment for Simulation in Healthcare (DASH) Score Sheet© and incorporate aspects from the score sheet in the formative evaluation of faculty. The DASH framework has been shown to contribute to the development of debriefing skills (INACSL, 2016).In addition, a debriefing framework used by educators supports learners in reframing the context of a situation and defending assumptions; this is the fundamental nature of faculty-student interaction (National League for Nursing [NLN] Board of Governors, 2015).

Linking the Simulation Framework

It was evident that the experiences of the nurse educators presented challenges unique to the online environment and most of them felt that they did not have the appropriate training to adjust. Despite the challenges, the participants spoke to the benefits and opportunities of virtual simulation; they made suggestions for program improvement and best practices. Concerning the NLN Jeffries (2016) Simulation Framework, the comparison of in-person versus online experiences demonstrated the importance of instructional design created for the online line environment for faculty development to improve debriefing facilitation. The change in

instructional design could immensely affect learning outcomes for students, such as exam preparation and skill acquisition, to support their clinical practice. As participants explained the benefits of virtual simulation, it became clear that if the simulation design characteristics and debriefing were more cohesive and specific for the online setting, it could positively affect the critical aspects of the framework. The framework's elements most influenced would be the educational practices of interaction, feedback, active learning, and collaboration. As participants expressed, the virtual simulation had opportunities and the power to improve simulation outcomes, including critical thinking, self-confidence, and ultimately safer patient care. Experiences proved to be a valuable tool to provide insight into the use of virtual simulation and debriefing for enhanced educational practice; still, nothing can change without an instructional design that accommodates the unique challenges and distinctions of online learning.

Constructivism

The simulation event was primarily experiential in nature; however, as this study focused on the faculty role of debriefing role to support learning, Constructivism was the theoretical foundation. In the debriefing, nurse educators are responsible for encouraging reflection to deepen student learning in a meaningful way relevant to their practice (Fogg et al., 2020). The quality of the post-experience debriefing largely relies on the educator's approach, one whose techniques should be learner-centric. Effective debriefing is conversational, bidirectional, collaborative, and reflective. However, the problem is that educators need opportunities to develop their skills and understand how to use a shared framework to anchor their teaching. Sawyer et al. (2016) explain that the practice of debriefing needs to mentor faculty to have a shared mental model with students and recognize the underlying assumption that everyone wants to improve upon their current foundation of knowledge.

Consequently, going on the premise of the need for continuity of learning, nurse educators leading debriefing need professional development opportunities that support their learning to evolve alongside virtual simulation. As constructivism recognizes the critical role that experience and reflection play, it can help debriefers learn how to intervene in challenging situations so that the benefits of simulation are not compromised. By learning to intervene and take the Socratic approach to debrief, educators can help students distil the lessons from the simulation experience (Dinkins & Cangelosi, 2019). The role of a nurse educator goes beyond reframing; developing the skill of a constructivist instructional approach supports meeting the diverse needs of learners, such as quiet learners and conversation domination. For nurse educators to help students assimilate knowledge and individual experiences, they need to holistically understand experiences, emotional reactions, and cultural differences that affect reflection (Dinkins & Cangelosi, 2019).

Summary

The COVID-19 pandemic propelled educational institutions to make swift transitions to the online environment and use innovative ways to provide clinical education to students. Virtual simulation and online debriefings became a teaching modality that nursing schools implemented to complement clinical education. INACSL (2021) HSSOBP has updated standards to include VS practice, so it is essential to examine experiences t o see how these new SOBP can be applied. Research Question 1 examined participant demographics and prerequisites for the debriefing; it was concluded that there were no specific courses needed to conduct the virtual simulation debriefing online. Research Question 2 asked participants to explain their experiences of in-person and online debriefing; it was evident that educators faced challenges using VS and facilitating a meaningful debriefing in an online environment. The participants experienced a

lack of faculty development opportunities to support their debriefing skills which ultimately affected their self-efficacy and perception of self. The lack of faculty development was frustrating for participants as it hindered their ability to interpret the vSim for Nursing™ student scores and plan appropriately for the debriefing. Although participants experienced various challenges, they all wanted to learn more and discuss the great benefits of virtual simulation debriefing. Participants explained that virtual simulation facilitated students' exposure to new clinical scenarios and improved skills mastery, which was valuable for preparing for clinical practice. Participants offered suggestions for program improvement and contribution to best practices. The most predominant theme was the desire to have professional development opportunities and mentorship. Thus, the recommendations included a multi-use platform that allows faculty to access online resources, the virtual simulation program, and a live chat for more informal interaction. It was also suggested that formative and summative evaluations be integrated into the course design so that faculty have more opportunities for growth and development. In this section, I discussed the themes in reference to relevant literature as a means to support my findings. The NLN Jeffries (2016) Simulation Framework identifies the critical connections between educational practices, simulation design characteristics and outcomes proposed by participants.

Chapter 7: Recommendations and Conclusion

This chapter brings the study to a conclusion and summarizes the research process and dissertation. I chose interpretive phenomenology to examine nurse educator experiences of virtual simulation debriefing practices at a single institution in Ontario. As debriefing is the focus of the research, constructivism was the theoretical underpinning utilized to explain how educators support students in reconciling experiences and knowledge for meaningful learning in debriefing. Seven participants were interviewed and brought forth essential concepts about best practices, training, challenges, experience, and opportunities for improvement. The discussion chapter examined each research question and answered them using the parent codes, which acted as the basis of each theme. The examination of the participant experiences has resulted in new and meaningful knowledge that may be applied to future nursing programs. This chapter explains the recommendations as three main groups being *standardization and instructor support, technology* and *pedagogy and instructional design.*

First, as virtual simulation is becoming an integral part of nursing curricula, faculty using the software and facilitating the debriefing should have equal professional development opportunities to obtain the knowledge, skill, and judgement to debrief in an online setting.

Standardization and Instructor Support

It may be a consideration to standardize the prerequisites for virtual simulation debriefing and design an OER or course that prepares the educators for debriefing. One of the challenges that participants explained was the tedious aspect of looking at the grades of the virtual simulation and figuring out how to interoperate them and translate this to the debriefing. The interpretations of data collected in the formative evaluation can lead to design decisions that may offer innovative solutions to the challenges presented. Another consideration to support building

trusting and supportive relationships between faculty may be incorporating a debriefing for the educators after they have debriefed with students. A debriefing for the educators can provide opportunities for sharing educational strategies and problem-solving. In alignment with the desire for more educator support, multiple participants mentioned the need for mentorship. Accordingly, one of the recommendations for mentorship among the nurse educators may be to have opportunities for small group learning. If the nurse educators were assigned groups at the beginning of the term, they would have a support group to communicate with and ask questions on a regular basis. Finally, the nursing program leadership team should aim to think divergently to use more innovative methods that combine formal and informal debriefing approaches (Verkuyl et al., 2020). For example, facilitated or non-facilitated chat rooms can be a tool to reflect on experiences. The NLN Jeffries (2016) Simulation Framework provides a blueprint to understand the critical connection between teacher-student interaction and its implications on educational practices and student outcomes.

Technology

A critical aspect of faculty development should support the use of educational technology, not only the use of the software. For example, learning to use an analytics tool would allow the educators to perform analytical queries on how students use the learning objects, which in turn it may contribute to the formative evaluation of the year four program (Graf et al., 2011). Analytics can help educators be more aware of student needs in virtual simulation and how to combine it with other grades in the course to provide insight about how to approach the debriefing (Graf et al., 2011). To be more progressive with faculty education, the educators leading the debriefing should evaluate successful practices and areas for improvement within

their teaching practice. Therefore, there should be a standardized tool to measure debriefing strategies and the achievement of intended course outcomes as a part of their evaluation.

It was recognized that the information about the student's virtual simulation scores, the Learning Management System (LMS), and Zoom are separate technologies, making it difficult to move from one program to another. Therefore, one recommendation is to create a platform where the virtual simulation, Zoom and educator resources can be accessed seamlessly. In addition, the platform should have ways to communicate with other facilitators in real-time; for example, a live chat or asynchronous forum may help to foster a sense of community.

Pedagogy and Instructional Design

Finally, the evaluation process should follow an evidence-based instructional design theory to support the integration of a learning needs assessment, course development, and evaluation. Reigeluth and Carr-Chellman (2009) has a collection of instructional design theories that may help guide the program's creation. For example, one of the theories is the instructional-analysis design theory which emphasizes the importance of the information-gathering process for making decisions about instruction; this may help recognize the need for faculty development earlier in the process (Reigeluth & Carr-Chellman, 2009).

The DASH framework, or a similar tool, should be incorporated as an evaluation tool. It is well established that the virtual simulation experience is indistinguishably bound to the debriefing, so one recommendation is to have a mentor go through the vSim for Nursing™ student scores and assess how the educator translates that to the debriefing. Evaluation is imperative for the program's growth and the people who work within the system. Therefore, formative and summative assessments should be integrated into the course's instructional design.

Application to Other Disciplines

Although this study examined a group of nursing educators at one institution, it sheds light on universal concepts extending beyond nursing and is applicable to distance education. This research recognizes the importance of educator experiences as a strategy to inform the instructional design of courses. The findings of this study support the advocacy for the need for equitable and innovative faculty development that is cognizant of the nuances of online education (Klenke-Borgmann, 2021). In addition, this research acknowledges that mentorship can be a powerful tool for faculty development and perception of self. When educators feel competent and supported in the continuity of learning, it is reflected in their approach to teaching.

Challenges and Successes of the Research

Regarding my study, two main aspects were challenging. First, only three participants wanted to participate in the study for the initial recruitment, which a neutral third party sent. To address this, the second round of recruitment emails was sent out two weeks later; at that point, four more people agreed to be a part of the study, totaling seven participants. Secondly, the co-coder had an extensive background in qualitative data coding. However, they did not have a nursing background, thus making creating a codebook and a shared understanding of the codes challenging. To address the issue of establishing a codebook, we spent additional time ensuring that descriptions of codes were meticulous and well-articulated. In doing so, the co-coder and I created a comprehensive coding framework that supported our high agreement rate of 98.4%. On reflection, the aspect of the research process that went well was that the participants were enthusiastic about doing the interviews. So, the data collection process was seamless, and the participants were very forthcoming about their experiences.

Future Research

For future research, this study could be repeated with a larger scope and include both student and educator perspectives for a more inclusive formative evaluation of a course that uses virtual simulation activities. Given that virtual simulation is a rapidly emerging part of nursing curricula, future research should consider examining the effects of virtual simulation when integrated into the curriculum. A research focus may be to examine and measure the impact of virtual simulation when used in combination with other types of simulation debriefing, such as instructor-led versus self-debriefing. This study only looked at one institution and a specific group of educators that used the vSim for Nursing™ program; therefore, research is needed to explore the use of other software and the amount of virtual simulation and debriefing required for students to meet the learning outcomes (Reed, 2020). Although the benefits of simulation and debriefing are well established, there is still a lack of research that measures how these benefits affect patients. Accordingly, future studies may consider exploring how simulation outcomes impact real-life patients (Bryant et al., 2020).

Historically, video recordings in simulated-based education are commonly used by facilitators during debriefing sessions to examine technical and nontechnical skills to support meaningful learning (Kim et al., 2019). In the context of this program, students completed the virtual simulations independently and asynchronously; however, the debriefing was conducted synchronously in a group of 15-16 students per instructor. Each student would have had different experiences within one group, making the video replay challenging as I would not address the uniqueness of each person's experience. VR is an increasingly common modality that provides an immersive experience through the recreation of reality experience using headsets (Bown et al., 2017). As each student's headset can display a different video, VR can be tailored to each

student's experience in the simulation instead of having the whole group replay one scenario. Therefore, one of the recommendations for the future would be to consider using VR as a part of virtual simulation debriefing; each student could wear a headset during the debriefing to revisit their own video playback; this would allow students to reassess clinical decision making and engage in reflection-on-action in a personalized way (Schön, 1983). There is potential to optimize VS outcomes by synergistically using innovative technology that not only fosters improved accessibility but also accommodates the nuances of individual online learning in the fourth industrial revolution.

Lastly, there was no HSSOBP (2021) for virtual simulation debriefing at the time of this study. Hence, as there is a growing body of evidence to understand simulation, future research could examine if course outcomes are improved when the updated HSSOBP (2021) have been integrated into their curriculum through the use of a specific instructional design model such as the Successive Approximation Model (SAM).

Conclusion

My intention for this study was to answer the overarching research question of describing the experiences of nurse educators who facilitate virtual simulation debriefing sessions. The scope of my research looked at seven nursing educators in one post-secondary institution in Ontario. I have approached my exploration of the phenomenon of nurse educator experiences with a unique positionality between the two. This study used interpretive phenomenology to facilitate an intensive investigation of individual experiences. From the constructivist paradigm, the researcher's analysis and interpretation of participants' experiences of their lifeworld created meaning for a deeper understanding of the phenomena (Pietkiewicz & Smith, 2014).

I employed semi-structured interviews via Zoom to understand the lived experiences of the educators facilitating the virtual debriefings. As this group of educators was a part of my professional reality, I took a relational approach to build trust and support open sharing. Throughout the interviews, I was diligent in being aware of potential power relations and reminded participants of the co-constructive nature of the research. As a result, the participants were forthcoming in the interviews and shared insightful information about their perceptions and program improvement suggestions. I disclosed to the participants that the findings may be shared in conferences and or publications to advocate for innovative change within the simulation community. The interviews were transcribed through Otter. ai, proofread for punctuation by the researcher and member-checked by the participants before the data analysis. I chose to take a latent approach to the data analysis to avoid overlooking implied meaning and context in the interviews. A coding framework was established with a co-coder; the intercoder reliability showed an exceptional agreement rate of 97%.

At the time of the course being offered, there was no HSSOBP (2021) that included virtual simulation, the lack of virtual simulation standards of practice may partially explain the challenges described by participants. For example, the updated HSSOBP (2021) explained that there was a need to develop standards regarding professional development in the virtual environment, including the re-assessment of PD, formative and summative assessments, which may have offered more guidance to the program and instructors. The SOBP (2016) at the time of the study was available; although derived from in-person simulation experiences, there were foundational pedagogical principles that could have been adapted to better support faculty and students. For example, the INACSL (2016) SOBP explained that debriefing facilitators need to

be competent in the process of debriefing, including acquiring specific initial education through a course or targeted work with an experienced mentor.

My constructivist paradigm led me to reflect on the participant's debriefing experience and intertwine it with my own experience to find meaning in the data. It was interesting to see that only one of the study members was full-time. They were the only participant who primarily did not focus on the challenges of debriefing but more on its benefits. The data from this study are aligned with other literature that highlights an inequity between full-time and adjunct faculty professional development opportunities (Hakkola, 2021; Reich et al., 2020). The NLN Jeffries (2016) Simulation Framework demonstrates the relationship between the student and educator educational practices and how it affects the simulation design characteristics and outcomes.

Program recommendations included *standardization and instructor support, technology* and *pedagogy and instructional design.* The study's findings demonstrated that educators had wide variability in debriefing practices, including challenges with professional development and managing technology while simultaneously conducting the debriefing. It may be beneficial to standardize training for all educators regardless of their employment status. Despite the challenges, all participants found VS helpful, especially in increased access to clinical experiences and mastery of skills. Furthermore, understanding that VS is a valuable modality, addressing issues of faculty inequity, instructional design and mentorship can support program growth and development with this new technology. The findings suggest that contributing to best practices would require the program to consider increasing access to educational resources, use an evidence-based debriefing framework, and follow an appropriate instructional design model.

VS was already in use prior to the pandemic and will continue to be used as an innovative teaching modality that provides learners with more standardized clinical experiences, increased accessibility to learning and improved skill mastery. The literature suggests that VS is here to stay, not as a replacement to in-person clinical education but as a complement to optimize student learning and improve clinical judgment. Now that the INACSL (2021) HSSOBP has been published, it is even more critical for nursing programs to examine their lessons learned. In doing so, we can facilitate more equitable faculty opportunities and nursing curricula that encompass the intricacies of simulation and distance education pedagogy.

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Appendix A: Research Ethics Board Approval

Athabasca University
RESEARCH CENTRE

CERTIFICATION OF ETHICAL APPROVAL

The Athabasca University Research Ethics Board (REB) has reviewed and approved the research project noted below. The REB is constituted and operates in accordance with the current version of the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS2) and Athabasca University Policy and Procedures.

Ethics File No.: **24344**

Principal Investigator:
Ms. Saudia Jadunandan, Graduate Student
Faculty of Humanities & Social Sciences\Doctor of Education (EdD) in Distance Education

Supervisor:
Dr. Cindy Ives (Supervisor)
Dr. Mohamed Ally (Supervisor)

Project Title:
Nurse Educator Experiences of Virtual Simulation Debriefing Practices

Effective Date: June 14, 2021 **Expiry Date**: June 13, 2022

Restrictions:

Any modification or amendment to the approved research must be submitted to the AUREB for approval.

Ethical approval is valid *for a period of one year*. An annual request for renewal must be submitted and approved by the above expiry date if a project is ongoing beyond one year.

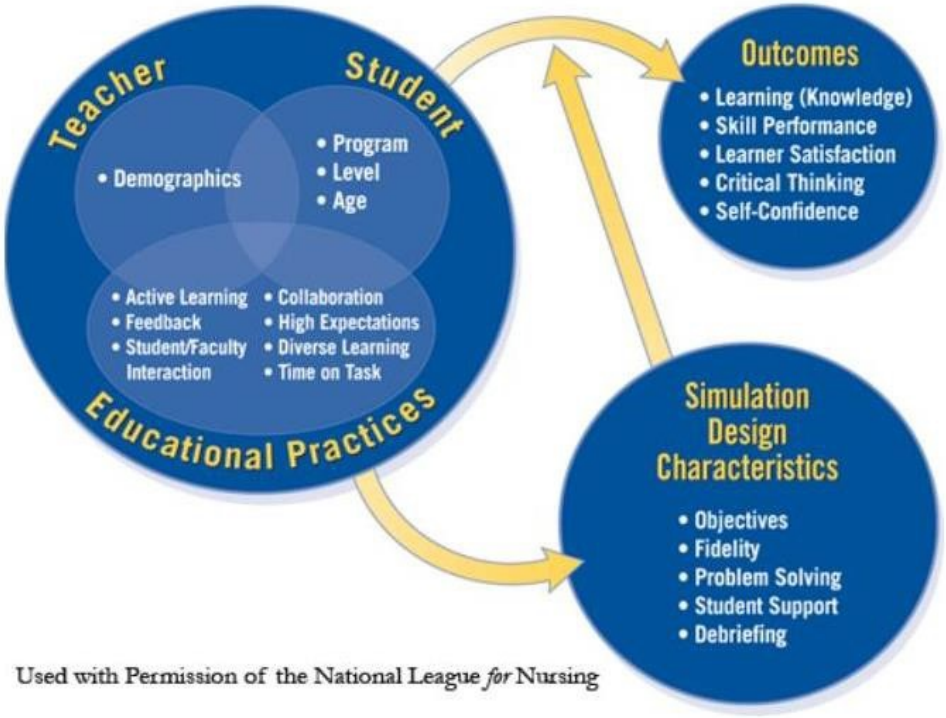
A Project Completion (Final) Report must be submitted when the research is complete *(i.e. all participant contact and data collection is concluded, no follow-up with participants is anticipated and findings have been made available/provided to participants (if applicable))* or the research is terminated.

Approved by: **Date: June 14, 2021**

Davina Bhandar, Chair
Faculty of Humanities & Social Sciences, Departmental Ethics Review Committee

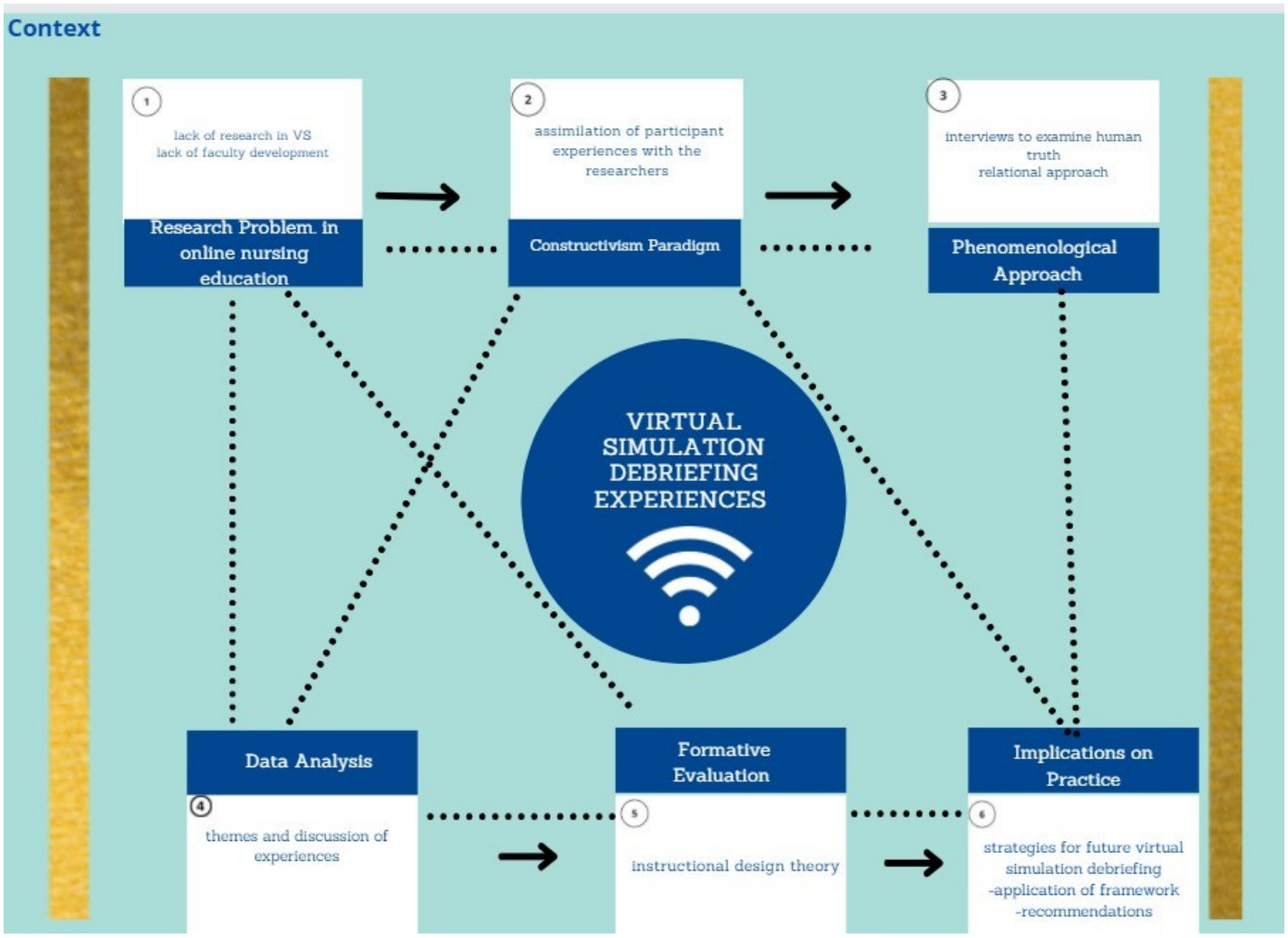
Athabasca University Research Ethics Board
University Research Services, Research Centre
1 University Drive, Athabasca AB Canada T9S 3A3
E-mail rebsec@athabascau.ca
Telephone: 780.213.2033

Appendix B: NLN Jefferies Simulation Framework



Used with Permission of the National League *for* Nursing

Appendix C: Conceptual Framework



Appendix D: Preamble

Onward and Upward: Introducing the Healthcare Simulation Standards of Best Practice™

The International Nursing Association for Clinical Simulation and Learning (INACSL) Standards Committee and the INACSL Board of Directors (BOD) introduce the fourth edition of the Standards of Best Practice. Since originally announced in 2011, the INACSL Standards of Best Practice have guided the integration, use, and advancement of simulation-based experiences within academia, clinical practice, and research. Healthcare professionals around the globe have and continue to champion simulation; thus, allowing the Standards to flourish. Before reflecting on the revision process, it is necessary to acknowledge how this past year has been a challenge for simulationists around the world. Although the COVID-19 pandemic disrupted healthcare practice and academia, the simulation community stepped up to the challenge with a rapid pivot to an unprecedented collaboration of resources. Through this camaraderie, we supported each other, our patients, our teams, our learners, and our frontline workers. Through a massive virtual response and a careful consideration of how to bring learners back to face-to-face simulation learning environments, we facilitated patient safety, supported frontline healthcare workers, and continued to educate our healthcare students while showcasing teamwork for healthcare professionals around the world. As we look to the future, we are excited to announce the INACSL Standards' re-envisioning and re-branding to the Healthcare Simulation Standards of Best Practice as we continue to engage the global and interprofessional community herein referred to as the Healthcare Simulation SOBP (HSSOBP™). For the 2021 revision, the Standards Committee gathered to commence work in the later part of 2018 with focus placed on historical and foundational elements of the Standards of Best Practice, survey data from both INACSL membership and the simulation community, current directions within practice and

research, and future recommendations noted within the 2016 Standards. In January of 2019, the INACSL Standards Committee welcomed a medical librarian and a diverse team of interprofessional healthcare professionals to serve as sub-committee members. Once the team was in place, work began by conducting an extensive literature review supported by our Medical Librarian, Jean Hillyer. Clearly emerging from both the literature and the membership survey was the need to develop two new Standards: "Professional Development" and "Prebriefing: Preparation and briefing." It is important to note that a rigorous discussion occurred regarding the creation of another new Standard about virtual simulation. After reviewing the literature and discussing with multiple stakeholders including the BOD, a decision was made that “virtual” learning was a method of simulation and the Standards would apply just as it would to the other areas of simulation methodology: manikin-based, standardized patient, skill performance, online, etc. We recognize 1876-1399/© 2019 Published by Elsevier Inc. on behalf of International Nursing Association for Clinical Simulation and Learning.
https://doi.org/10.1016/j.ecns.2021.08.006 Onward and Upward: Introducing the Healthcare Simulation Standards of Best PracticeTM 2 that the pandemic and rapidly advancing technology may have a profound effect and change this decision for future iterations of the Standards. The process for Standards revision was not always easy, requiring constant and thoughtful debate and discussion. As an ever-evolving science, there continues to be a growth in new and different modalities, applications, changes in terminology, as well as unpredictable life changes such as a global pandemic. At some point, we had to impose a stopping point or the Standards would never be published. The end date for literature became December 2020. We had to work through the pandemic and recognize that some of the profound impacts of it will not be present in this version. At some point, we had to recognize that the committee members were also affected by

the pandemic and needed to focus on their other obligations. We became a support system, a welcome touch point for each other, and an acknowledgement that simulationists continue to lead and innovate even when it's difficult. You will see that a few Standards had minimal revisions, while others underwent significant changes. As a committee, we have spent hundreds of hours searching and reviewing the literature then debating and discussing all things related to the Standards. When we had questions or a new comment or area of feedback was provided, we returned to the literature. These Standards are based on and reflect the evidence in the literature. These documents represent the passion, blood, sweat, and tears of a dedicated team who were committed to producing their best work to benefit the simulation community. In this iteration of the Standards, we have integrated the SSH Healthcare Simulationists Code of Ethics and have used the SSH Healthcare Simulation Dictionary as the basis for terminology. The Glossary will continue to support the HSSOBP™ and clarify terms but was significantly reduced in support of the SSH dictionary. These Standards follow standard terminology and definitions from the simulation community. Recognizing that there is some variability in terminology from center to center, profession to profession, and around the world, we have included the glossary to make these standards more accessible to individuals regardless of background, profession, language, or geographical area. The glossary helps define and demonstrate how we are using these words in the context of these Standards. Our goal is to provide this as a keystone for translation for anyone implementing these Standards. The 2021 edition of the Standards is the collective effort of the Standards Committee and subcommittee members that represented multiple professions and international input as well as, advisory panel professional organizations, expert reviewers, INACSL Board of Directors, and a medical librarian. We want to thank them for their contributions. All participants aimed to ensure the Healthcare Simulation Standards of Best

Practice were a platform for all simulationists and represented the best practices to design, conduct, and evaluate simulation-based experiences. While the pandemic delayed our initial release date of 2020, we are excited and know that the time is right for publication of these new healthcare focused Standards. These new Standards were a collaborative effort, and every person participating made a valuable contribution to the final product. The HSSOBP™ consist of the following individual Standards: Professional Development (NEW) Prebriefing: Preparation and Briefing (NEW) Simulation Design Facilitation The Debriefing Process Operations Outcomes and Objectives Professional Integrity Sim-Enhanced IPE Evaluation of Learning and Performance Simulation Glossary It is important to note that these Standards are aspirational and serve as a guide. We recognize and understand that context, resources, accreditation needs, etc., may affect the implementation and attainment of the Standards, however, we hope that they provide talking points of discussion with stakeholders in your own institutions and areas of practice. As our work continues in the simulation community, we challenge simulationists around the world to: • Continue simulation research, ingenuity, and creativity. • Keep publishing, presenting, and disseminating work. • Seek best practice and excellence in simulation experiences. • Apply the Standards and seek to integrate them into all simulation programs. As the Standards are living documents, there will ALWAYS be ongoing opportunities for change and growth within them and in our community of practice. We, as a simulation community, must continue to seek excellence and quality in simulation education and practice. We look forward to the future of healthcare simulation and the journey for excellence in best practice.

Appendix E: Interview Guide

Demographics

1. Which category below includes your age?

- [ ] 21-29
- [ ] 30-39
- [ ] 40-49
- [ ] 50-59
- [ ] 60 or older

2. What is the highest level of school you have completed or the highest degree you have received?

- [ ] Bachelor degree
- [ ] Master degree
- [ ] Master degree in progress
- [ ] Doctorate
- [ ] Doctoral degree in progress

3. Which category below includes the number of years you have been teaching in a Nursing Program:

- [ ] 0-5 years
- [ ] 6-10 years
- [ ] 15- 20 years
- [ ] 21+ years

4. What is your current employment status at your post-secondary institution?

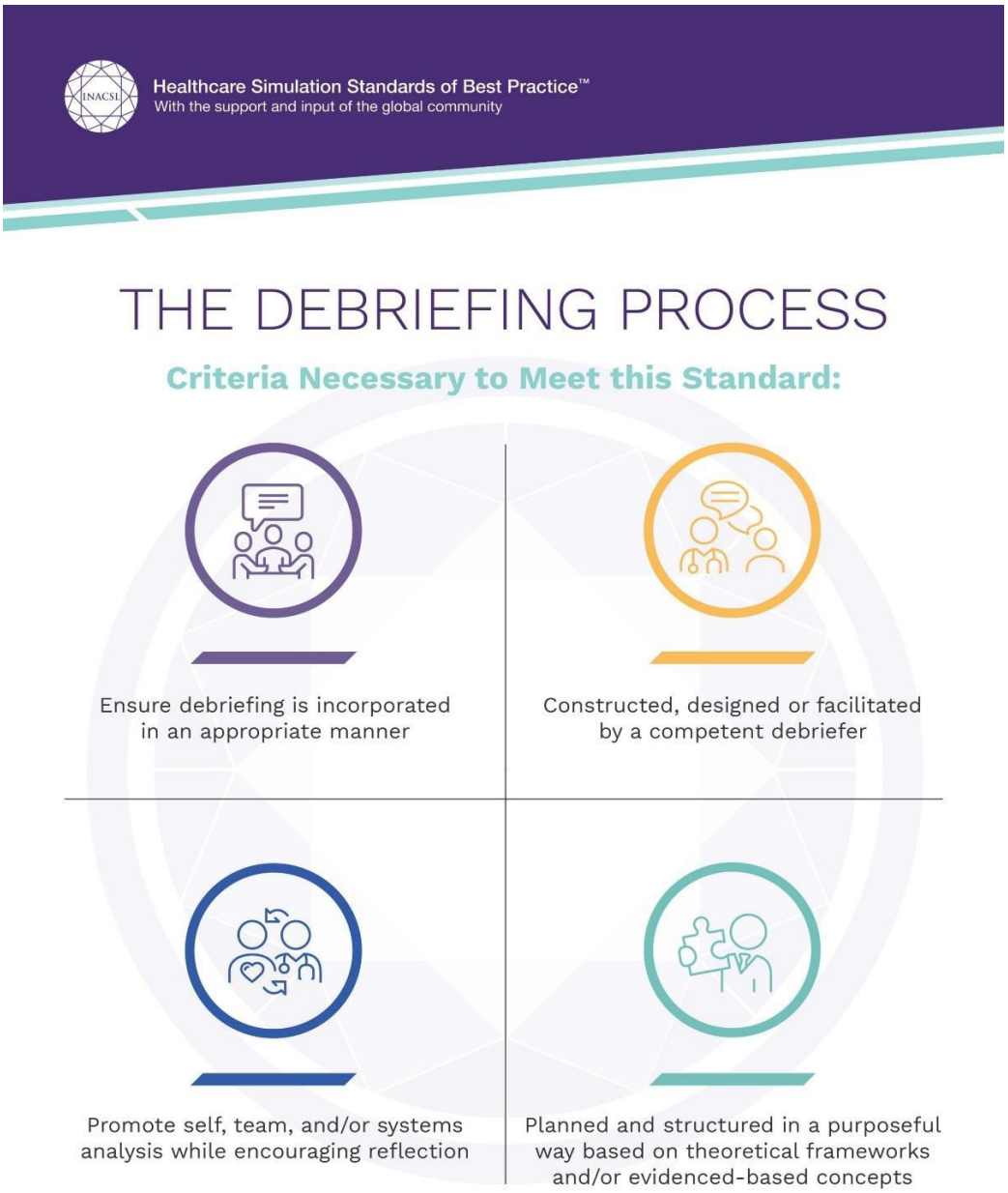
[redacted] Full-time

[redacted] Part-time

[redacted] Sessional

1. Please tell me a bit of yourself?
2. Please describe any training or specific prerequisites you needed to have before virtual simulation debriefing.
3. Could you explain if there are best practices or a framework for debriefers to follow? Could you explain how debriefing online different than in-person debriefing?
4. What are some of the challenges you experienced with virtual debriefing?
5. What opportunities do you think that virtual simulation debriefing brings to nursing education?
6. What are your suggestions for an improved experience as a virtual simulation debriefer?

Appendix F: Healthcare Simulation Standards of Best Practice; The Debriefing Process



Appendix G: Healthcare Simulation Standards of Best Practice; Professional Development Criteria

Appendix H: Participant Information and Invitation Letter

PARTICIPANTS NEEDED FOR RESEARCH IN VIRTUAL SIMULATION NURSE EDUCATORS- YEAR 4 BSCN PROFESSORS

Dear Nursing Instructor,

My name is Saudia Jadunandan and I am a doctoral student at Athabasca University. As a requirement to complete my degree of Doctor of Education in Distance Education, I am conducting a research project about nursing instructors' experiences of virtual simulation debriefing practices. I am conducting this project under the supervision of Dr. Cindy Ives and Dr. Mohamed Ally.

I am looking for volunteers who are nursing instructors to partake in a study to examine their experience leading virtual simulation debriefing for the Year 4 Bachelor of Science Nursing program who have used the software vSim for Nursing™ for Nursing. As participant in this study, you would be interviewed about your experiences leading debriefing with year 4 students Your participation is entirely voluntary and would take approximately 30-60 minutes of your time, individually. You have the option to withdraw from the study at any time and your information will be safety discarded.

By participating in this study, you will help me to better understand the lived experiences of nurse educator experiences who have led virtual simulation debriefing online in this program. The data gathered from this phenomenological approach could be used to create blended and distance education learning tools specific to the virtual simulation setting and contribute to the development of best practices in virtual simulation. As a nursing instructor, your input is very valuable to help me to understand this experience. If you would like to participate and/or hear more information about this study, please email me directly.

To learn more about, or participate in, this study, please contact:

Principal Investigator: Saudia Jadunandan

Email: sjadunandan1@athabasca.edu

phone: 647-632-6787

This study is supervised by:

Dr. Cindy Ives, Email: cindyi@athabascau.ca

Dr. Mohamed Ally Email: Mohameda@athabascau.ca

Appendix I: Informed Consent Form

This study has been reviewed by the Athabasca University Research Ethics Board.

PARTICIPANT CONSENT FORM

Nurse Educator Experiences of Virtual Simulation Debriefing Practices [Approval #202/

STUDY TEAM

Principal Investigator (Researcher):
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T9S 3A3

Dear Nursing Instructor,

This letter is sent on behalf of Saudia Jadunandan who a is doctoral student at Athabasca University is. As a requirement to complete the degree of Doctor of Education in Distance Education, the student is conducting a research project about nurse educator experiences of virtual simulation debriefing practices. The project is supervised by Dr. Cindy Ives and Dr. Mohamed Ally.

This form is a part of the process of informed consent. The information provided should help you understand what this research is about and what your participation will involve, should you choose to participate. Please contact the principal investigator, Saudia Jadunandan, if you have any questions about the research project or would like further information before you consent to participate. If you have any further questions, you may also contact my research supervisors Dr. Cindy Ives and Dr. Mohamed Ally.

As a participant, you are asked to take part in one audio recorded interview about your experience of virtual simulation debriefing practices after teaching the Year 4 BScN program course NSE 417 and or NSE 418 from September 2020 to April 2021. All interviews will take place via Zoom software. Participation in the interview will take approximately 30-60 minutes of your time. All names will be removed and replaced with a study ID number to protect the anonymity of the participants.

The main benefit of participation in this study is the opportunity to contribute to the development of knowledge in the field of online nursing education within undergraduate nursing programs. The aim of study is to better understand what supports are needed for the nurse educators leading online debriefing for virtual simulation.

There are no known risks associated with participating in this study. Any information that is obtained with this study and that can be identified with you will remain stored in encrypted files, in a secure locked place.

If you choose not to participate, or if you decide to withdraw from the research once it has started (by notifying me that you no longer wish to participate), there will be no negative consequences at any time. Your participation in this study is entirely voluntary, and if at any time you become uncomfortable, you may refuse to answer any questions or share information. Within 3 weeks following the interview, you will receive an interview transcript via email and be given the opportunity to alter/clarify any comments that you have made.

I will make every effort to ensure your confidentiality is maintained. You will not be identified in publications. I will be responsible for maintaining confidentiality of any data that I possess. All participants will be given a participant's ID number that will be used if there is a need to refer to a specific participant in the written version of the research. All data, both audio and written, will be stored safely. My dissertation supervisors and I will be the only people with access to the data. Data kept on my personal laptop will be double password protected along with the files being password protected.

This study will be using Zoom which is a U.S. company and as such is subject to U.S. laws, including the U.S. CLOUD Act and U.S. Patriot Act. As such, there is a possibility that information about you may be accessed without your knowledge or consent by the US government in compliance with the US laws. The security and privacy policy for the web survey company can be found at the following link: https://zoom.us/privacy.

Once the research is completed, participants and members of the public can obtain a written copy of the results reported in the dissertation through the Athabasca University Library's Digital Thesis and Project Room.

You may keep a copy of this form that explains the nature of your participation and the handling of the information you supply. If you have any questions about this study or require further information, now or anytime during the study, please contact Saudia Jadunandan or Dr. Cindy Ives or Dr. Mohamed Ally using the contact information above.

[Place Holder for this statement]: *This study has been approved by the Ryerson University Research Ethics Board and the Athabasca University Research Ethics Board. Should you have any comments or concerns regarding your treatment as a participant in this study, please contact the Office of Research Ethics at 1-800-788-9041, ext. 6718 or by e-mail to rebsec@athabascau.ca.*

Thank you for your assistance in this project, your participation is greatly appreciated.

Informed Consent:

Your signature indicates that you have read the information provided above and have decided to participate in this study. You may withdraw at any time after signing this form, if you decide you do not wish to participate. The information that you have provided up to that time can be retained by the researchers in their reports or you can request that we don't use it and it will be withdrawn. (If you decide to withdraw, I will ask you for your preference at that time).

Name: _____Date: _____

Signature: _____

e- mail address: _____

By initialing the statement(s) below,

_____ I am granting permission for the researcher to use an audio recorder.
_____ I acknowledge that the researcher may use specific quotations of mine, without identifying me.
_____I would like to receive a copy of the results of this research study by email.

Appendix J: Hierarchical Coding Framework