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A FRAMEWORK FOR INTEGRATING SIMULATION INTO THE BACHELOR OF NURSING SCIENCE PROGRAMME IN ESWATINI

SITHEMBILE SIPHIWE SHONGWE

A thesis submitted to the Faculty of Health Sciences, University of the Witwatersrand, in fulfilment of the requirements for the degree of Doctor of Philosophy in Nursing

Johannesburg, 2024

DECLARATION

I, Sithembile Siphiwe Shongwe, declare that this thesis is my own unaided work. It is being submitted for the Degree of Doctor of Philosophy in Nursing at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other University.



On the 2st day of May 2024 in Johannesburg

DEDICATION

This work is dedicated to my husband, Dr Nkululeko Gwebu, who realised my potential and supported me in achieving all my degrees: BSc N, MSc, and now this highest degree. Thank you for believing in me wholeheartedly.

In all, to God be the glory forever!

PRESENTATIONS ARISING FROM THIS RESEARCH WORK

Shongwe, S.S. & Armstrong, S.J. (2022). Best Practices in Simulation-Based Education in the Educational Preparation of Undergraduate Nursing Students: Scoping Review. *FPNL& NEA Lighting the Future Nurses Conference 2022*, Modderfontein, Johannesburg, South Africa, 22 & 23 September 2022. Accessible at: https://medixeed.com/lighting-the-future/posters/

Shongwe, S.S. & Armstrong, S.J. (2023). The State of Simulation Use in Eswatini Nursing Education Institutions. *FPNL& NEA Nurses Conference 2023*, CSIR Internal Conference Centre, Pretoria, South Africa, 17-19 August 2023.

ABSTRACT

Background: Simulation-based education is a required pedagogical method for preparing undergraduate students to become nurses. Its ultimate goal is to develop practice-ready professionals rather than introduce the latest technology into training. In Eswatini, simulation is used; however, no framework guides nursing education institutions on how to integrate simulation into their educational programmes to enhance clinical teaching and learning effectively.

Purpose: The aim of this study was to develop a framework for integrating simulation into the Bachelor of Nursing Science programme in Eswatini.

Research methods: A mixed methods approach utilising multilevel designs guided the inquiry process. Inferences drawn from the various strands of the mixed methods data were integrated to address the study problem. Phase one was a scoping review conducted to explore best practices of simulation-based education in the educational preparation of undergraduate nursing students locally (sub-Saharan Africa) and internationally. A Joanna Briggs Institute methodological approach guided the research process. Sixty articles were included in this scoping review.

Phase two was a survey study conducted to assess the state of simulation use in the educational preparation of Bachelor of Nursing Science Students in Eswatini through auditing four (4) simulation laboratories (Study A) and a survey with (n=46) nurse educators, a census (total) sampling technique was used to select the study participants.

Phase three used an iterative process together with simulation experts (n=2) to develop the framework and to identify activities to consider when integrating simulation in Eswatini. These were sourced from tabulated lessons learned or inferences drawn based on the findings of phases 1 and 2. The NLN Jeffries simulation theory guided the development of the framework. In phase four, Eswatini nurse educator experts (n=16) evaluated the framework's utility in a Delphi study completed in two rounds.

Findings: In phase one, best practices principal to simulation-based education emerged. The study findings were inductively developed, resulting in four core codes, namely: (i)

lecturer preparation, (ii) student elements, (iii) designing simulations and (iv) innovations in simulation. Ninety-five per cent (95%) of the literature was from international settings compared to 5% from the African context.

Phase two: Eswatini nursing education institutions were somewhat ready for simulation; this status was attributed to the lack of trained educators in simulation principles, a lack of financial and resource planning and limited infrastructure and equipment for supporting simulation-based education.

Phase three: a framework with the following five domains was developed to guide the process of integrating simulation into the Nursing Education programme in Eswatini: Training or preparation of educators; Integration of simulation into the nursing/midwifery programme; Simulation equipment; Simulation infrastructure; and Student/simulation participants.

Phase four: Eswatini nurse educators found the framework relevant and suggested feasible strategies for the Eswatini nursing education context. The strategies included sensitising management to increase simulation-based education support and sourcing funding for procuring equipment and infrastructure development.

Conclusion: The framework for integrating simulation into the Bachelor of Nursing Science Programme was designed to allow a step-by-step implementation approach due to existing contextual challenges. The challenges include a lack of trained educators/lecturers on simulation-based education principles, an absence of simulation champions, insufficient equipment, infrastructure inadequacies, fiscal constraints and dwindling management support. The framework can potentially guide the successful integration of effective simulation into Eswatini nursing education institutions.

Recommendations: There is a need for the current nurse educators to be trained in the simulation teaching and learning strategy to ensure the effective use of simulation-based education. Nursing education institutions must develop financial plans for funding the required simulation resources (educators' training, equipment and infrastructure) to ensure the sustainability of simulation-based education.

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ABBREVIATIONS

BNSc Bachelor of Nursing Science

CHSE Certified Healthcare Simulation Educator

EMCU ESWATINI Christian Medical University

ENC Eswatini Nursing Council

JBI Joanna Briggs Institute

HFS High fidelity Simulation

LFS Low fidelity Simulation

MFS Medium Fidelity Simulation

INACSL International Nursing Association of Clinical and Simulation Learning

NLN National League for Nursing

NE Nurse Educator

NEI Nursing Education Institution

SBE Simulation-Based Education

SANC South African Nursing Council

UNESWA University of Eswatini

WHO World Health Organisation

CHAPTER 1: OVERVIEW OF THE RESEARCH

This chapter provides an overview of the research study. The aspects covered include an introduction to the research problem, a statement of the problem, the study purpose, objectives and conceptual definitions.

1.1 INTRODUCTION

Simulation is widely seen as a valuable teaching strategy for undergraduates, postgraduates and lifelong learners in clinical practice (continuing education) (Motola et al., 2013; Lavoie and Sean, 2017; Martins et al., 2018). The initiative for recommending simulation in healthcare education is informed by evidence revealing that it can improve the acquisition of nursing competencies (WHO, 2013). Several professional healthcare and educational organisations endorse using simulation in nursing education, including the World Health Organisation (WHO), the Association for Clinical Simulation and Learning (INACSL), and the National League for Nursing (NLN) (WHO, 2013; Gaberson et al., 2015; Riley, 2016; Martins et al., 2018). In addition, simulation experts emphasise that the ultimate "goal of simulation-based education is not to introduce the latest technology into training but to develop practice-ready professionals" (Bryant et al., 2020, p.34). In Eswatini, concerns about the practice readiness of newly qualified nurses were reported (Dlamini et al., 2014; Seed Global Health, 2019). These concerns continue, while simulation as a teaching strategy is not yet fully embraced. Therefore, this study sought to develop a framework to enable nurse educators to integrate simulation into the Bachelor of Nursing Science (BNSc) programme in Eswatini in order to complement current clinical nursing education delivery strategies.

The concepts of simulation have been defined in the literature. One of the early definitions was coined by Gaba (2004), who stated that it "is a technique—not a technology—to replace or amplify real experiences with guided experiences, often immersive in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion" (Gaba, 2004, p. i2). It is further defined as an interactive educational strategy that enables learners to consolidate and conceptualise knowledge, develop technical skills and have the opportunity to reflect on their practice, thereby leading to the preparation of competent professionals (Cant and Cooper, 2017a; Martins et al., 2018). Bland et al. (2011) defined simulation as a

strategy that enables learners to acquire the required competencies through active participation. The Healthcare Simulation Standards of Best Practice defines simulation as an educational strategy in which learning experiences are created to resemble real-life situations in order to develop, enhance and evaluate learner performance (INACSL Standards Committee et al., 2021).

The World Health Organisation views simulation as an educational strategy that is useful to Nursing and Midwifery educators (Martins et al., 2018) to prepare students to qualify with the required competencies (Felton and Wright, 2017; Bryant et al., 2020). Bland et al. (2011) emphasised that it must reflect reality (real-life clinical situations) for it to be an effective educational strategy. Jeffries (2005) supports that simulation enables students to attain the programme outcomes, however, its effectiveness is dependent on the educator and the learner's interaction during the experience, their roles and expectations. In this study, simulation refers to an educational strategy that enables educators to replicate clinical situations in order for students to learn, practice and develop clinical competencies prior to engaging with real patients.

The aspect of creating learning opportunities that mimic real-life situations is emphasised in simulation, and it relates to the element of fidelity. Fidelity denotes realism/authenticity, which is the degree to which a simulation experience reflects reality (Meakim et al., 2013; Moran et al., 2018). Simulation fidelities range from a low level, medium level and high level (Aebersold, 2018; Moran et al., 2018). Although there is a range of simulation fidelity levels, the World Health Organisation (WHO) suggests that each nursing education setting select economically feasible simulation techniques (WHO, 2013; Martins et al., 2018). High-fidelity methods were deemed suitable for high-resource settings, while low-fidelity methods are suited for limited-resource settings (WHO, 2013; Martins et al., 2018). Despite all the evidence of the effectiveness of simulation in nursing education, Eswatini nursing education institutions (NEIs) have not yet fully adopted this innovative educational strategy.

Simulation-based education is not a novelty pedagogy (Bland et al., 2011; Taplay et al., 2014; Owen, 2016; Aebersold, 2018). However, it has evolved due to technological advances that produce experiences that mimic real-life clinical situations (medium and high fidelity

dimensions) (Taplay et al., 2015). Evidence shows that nurse educators and institutions have not been prepared to embrace the application of the simulation dimensions mentioned above, particularly the high fidelity, but mostly content with low and medium fidelity (van Vuuren et al., 2018). Thurling (2017); Al-Ghareeb and Cooper (2016); and White (2017) attest to these inconsistencies. Taplay et al. (2014) attribute the challenges of inadequate uptake/integration of simulation into the curriculum to the organisational culture.

Simulation is an innovative educational strategy that has emerged to address gaps in clinical learning and move the nursing profession to twenty-first-century learning expectations, including critical thinking (Hayden et al., 2014). The gaps in clinical learning arise from multiple constraints that exist in nursing education and the clinical learning environment. They include an increased number of students demanding similar learning opportunities, concerns about the competencies of qualified nurses, patient safety awareness, reduced inpatient stays, quality of educators and limited time spent on student clinical supervision (Motola et al., 2013; Hayden et al., 2014; Larue et al., 2015; Zitzelsberger et al., 2017; Bvumbwe and Mtshali, 2018). These issues make it challenging for nurse educators to provide high-quality learning experiences (Hayden et al., 2014).

Simulation supports clinical learning effectively when integrated into a nursing education programme (Humphreys, 2013; Motola et al., 2013), provided all conditions of implementing it are met within the programme (Hayden et al., 2014). Hayden et al. (2014) conducted a longitudinal, randomised, controlled study to determine whether simulation can replace traditional clinical learning hours. They found simulation comparable to traditional clinical learning and, as a result, decided on a 50:50 contribution towards clinical hours for the Bachelor of Nursing Science programme (Hayden et al., 2014). Similarly, Larue et al. (2015) found that simulation complements traditional didactic knowledge and clinical delivery strategies. The positive effect of simulation in nursing education was tested across the following core courses of the Bachelor of Nursing Science degree: general nursing, community health nursing, paediatric nursing, mental health nursing, and midwifery (Hayden et al., 2014).

Simulation enables nurse educators to provide learning encompassing the three learning domains: cognitive, psychomotor and affective (Kardong-Edgren et al., 2010a). In addition, simulation allows nurse educators to teach undergraduate nursing students how to use the acquired knowledge to solve actual clinical cases (Benner et al., 2011). Botma (2014) and Tjoflåt & Våga (2017) added that simulation promotes integrating theory into practice. Humphreys (2013) and Zitzelsberger et al. (2017) concluded that it enables nurse educators to evaluate nursing students' developing knowledge, skills, and critical thinking abilities before exposure to clinical practice.

Robust evidence regarding simulation benefits attracted nursing educationalists, licensing boards, programme accreditors, healthcare organisations, and researchers to implement simulation in healthcare education (Gaba, 2004). Reported evidence showed that students increasingly demonstrated improved performance (Gaba, 2004), healthcare quality improved, and patient safety was ensured (WHO, 2013). Furthermore, simulation fosters a learner-centred approach (Jeffries, 2005; Humphreys, 2013). In addition, student nurses can practice all clinical situations, including emergencies, without fear of endangering a patient (Hayden et al., 2014). However, obtaining the maximum benefits of simulation requires readiness for change, commitment, knowledge, and skills to integrate simulation into the nursing programme (Humphreys, 2013; Taplay et al., 2014; Foisy-Doll and Leighton, 2017; Tjoflåt and Våga, 2017)

There are benefits of using simulation, but there are some perceived disadvantages. Larue et al. (2015) reported that simulation might be a financial burden to some institutions as costs are required to purchase, maintain, and upgrade equipment and staff training. However, simulation cost varies depending on the application level (Gaba, 2004; WHO, 2013). Apart from the financial implications, some academic staff disapprove of simulation because it is time-consuming, and they fear using technology (Jansen et al., 2009). Other literature revealed that there is a possibility that students could confuse reality with simulation (Larue et al., 2015). While these disadvantages may be genuine, nursing education institutions must produce competent nursing students (Casey et al., 2011).

Eswatini Nursing Education Context

Eswatini, previously known as Swaziland until 2018, is a Kingdom situated within the sub-Saharan Africa Region and surrounded by South Africa and Mozambique (Msibi et al., 2020). The country has a population of approximately 1.2 million. There are four (4) nursing education institutions, three universities and one college in Eswatini.

The training of nurses in Eswatini began in 1928 at Raleigh Fitkin Memorial Hospital by a missionary medical practitioner, Dr David Hynd, from the church of the Nazarene (Southern Africa Nazarene University, 2021). Currently, nursing education is offered in nursing education institutions, while hospitals, health centres, clinics, and community settings are used for clinical placements. The first nursing education institution was built in 1956 by the Church of the Nazarene partners. It was named the Nazarene Nursing College, offering two nursing programmes: General Nursing and Midwifery (Southern Africa Nazarene University, 2021).

Nursing education training was not regulated until the establishment of the Eswatini Nursing Council (ENC) under the Nursing and Midwifery Act, number 16 of 1965 (Eswatini Ministry of Health, 2020; Eswatini Nursing Council, 2023). The Eswatini government, through the Ministry of Health, has authorised the Eswatini Nursing Council to regulate, direct and control nursing and midwifery education, practice and conduct in the country in order to protect the public from unsafe practice (Eswatini Nursing Council, 2023). Apart from the Nursing Council, the Eswatini government under the Ministry of Education expects all institutions of higher education to be registered and accredited by the Eswatini Higher Education Council. The Eswatini Higher Education Council was established in 2015 under the Higher Education Act of 2013 (Swaziland Government, 2013).

Presently, Eswatini nursing education institutions offer both undergraduate and postgraduate programmes, and all lead to licensure with the Eswatini Nursing Council. Undergraduate programmes: Nursing Assistance Certificate, duration of training 2 years; General Nursing leading to a Diploma, duration 3 years, and a four-year generic degree leading to a Bachelor of Nursing Science. Postgraduate certificates: Midwifery, Mental Health, and Nephrology nursing all have a 1-year duration. Also available are two master's degree programmes,

Family Nurse Practitioner and Midwifery Science, offered part-time and full-time, respectively.

The Eswatini Nursing Council (ENC) noted some gaps in qualified nurses' competencies; as a result, a competency framework was developed for undergraduate programmes that lead graduates to be licenced as registered nurses (diploma), midwives and mental health nurses (certificates) and bachelor of nursing science (Swaziland Nursing Council, 2014; USAID, 2015a, 2015b; Msibi et al., 2020). The Eswatini Nursing Council defines competencies as a set of knowledge, skills and attitudes that guide performance in line with the set standards of professional practice (Swaziland Nursing Council, 2014). The competency framework has seven domains: provision of care, information management systems, emergency trauma and disaster management, infection prevention and control, leadership management, ethics, legal issues and professional conduct, prevention, treatment and care- HIV, AIDS and TB (Swaziland Nursing Council, 2014; USAID, 2015b).

The launch of the competency framework was successful; a pre-entry to practice examination and a clinical portfolio book, a Standard Clinical Competencies Record Book (SCCRB), was introduced in 2018 to evaluate the graduates' competencies prelicensure (USAID, 2015b; Msibi et al., 2020). The Standard Clinical Competencies Record Book (SCCRB) is a book that contains clinical skills that should be completed by the student when providing direct patient care in the clinical area under the supervision of a lecturer or a preceptor, who are the sole assessors. The pre-entry to practice examination is a licensure exam written by all newly graduated nursing students who intend to register with the Eswatini Nursing Council for the first time (Seed Global Health, 2019).

The nursing education institutions upgraded the curriculum content to map the competencies; however, it has not influenced how clinical nursing education is delivered. Countries like Malawi, Zambia, Ethiopia, and the Democratic Republic of Congo, which adopted the competency-based approach with help from the International Center for AIDS Care and Treatment Programs (ICAP), upgraded their curriculum and integrated simulation to address the skills gaps in pre-licensure education (ICAP, 2016).

Eswatini still depends on passive educational delivery methods. The passive educational approach is a teacher-centred model where educators use lectures, reading assignments, observer role— 'see one, do one' clinical teaching model and watching a simulation video without debriefing (Billings and Halstead, 2016; Rutherford-Hemming and Alfes, 2017; Aebersold, 2018; Moran et al., 2018). All the nursing education institutions have simulation laboratories. However, they are mainly used for the demonstration of skills and return demonstrations, which are quickly followed by an Objective Structured Clinical Examination (OSCE) and clinical placement. Benner et al. (2011), who disapproved of the use of passive teaching methods in preservice nursing education, said, "… we lose sight when we imagine that formal abstract concepts will automatically be perceived in actual situations where and when this knowledge is relevant," (Benner et al., 2011, p.35).

A study by Dlamini et al. (2014), who investigated the perspectives of Eswatini stakeholders on newly qualified nurses' readiness for practice, reported that nurse managers perceived that the new graduates are theory-laden but lack clinical skills and suggested the need for constant supervision. In the same study, new graduates felt they were not ready to hit the ground running; they lacked confidence and feared harming the patient due to the lack of hands-on- practice during training, particularly in performing invasive clinical skills (Dlamini et al., 2014). Dlamini et al. (2014) further reported that the graduates who hold a bachelor's degree were heavily criticised compared to diploma graduates.

Various challenges compromise the Eswatini nursing education clinical learning environment. There is still an over-reliance on the apprenticeship model; currently, it is overwhelmed by students from various healthcare profession disciplines, including nursing students, who tend to be way more than the patients in each facility and a chronic shortage of clinicians. As a result, the nursing council has restricted student nurses' intake to 40 per nursing education institution; however, new nursing programmes are introduced, without the addition of new clinical sites. Nursing students compete for clinical placements due to increased student intakes compounded by issues of maldistribution of students and the limited availability of clinical supervisors and preceptors, to name a few.

The challenges that Eswatini nursing education faces, particularly with clinical education, are not unique. They are also reported in the literature across the globe: South Africa

(Roziers et al., 2014; Armstrong and Rispel, 2015); Madagascar and Tanzania (Tjoflåt et al., 2021); Canada (Hall, 2006; Larue, Pepin and Allard, 2015; Oudshoorn and Sinclair, 2015); the USA (Hayden et al., 2014; Hernandez-Acevedo, 2021); Australia (Roberts et al., 2019; Reid-Searl et al., 2021); Ireland (Redmond et al., 2020); Morocco (Qaisar et al., 2020). As such, many settings have integrated simulation into the nursing programme (Kardong-Edgren et al., 2008; Hayden et al., 2014; Oudshoorn and Sinclair, 2015; Aebersold, 2018; Parker and Grech, 2018; Amod and Brysiewicz, 2019; Redmond et al., 2020; Jacob et al., 2021) and the World Health Organisation has endorsed this educational strategy to improve the acquisition of clinical competencies in nursing and midwifery education (Martins et al., 2018). McLaughlin et al. (2010) concluded that integrating simulation benefits educators and learners.

Park et al. (2016) objected to the over-reliance on an apprenticeship in this century and advocated for transformation to pedagogical philosophies incorporating simulation. Simulation enhances the provision of high-quality clinical learning experiences (Hayden et al., 2014) and blends with the competency-based approach effectively (Larue et al., 2015). Therefore, the researcher believes that Eswatini's nursing education context would benefit from integrating simulation-based education.

1.2 PROBLEM STATEMENT

The World Health Organisation states that "the purpose of nursing and midwifery education and training is to prepare highly qualified and competent professionals who are capable of providing an effective response to the various needs of patients and their families (Martins et al., 2018, p. 9). Recently, the Eswatini Nursing Council and other researchers have reported that newly qualified nurses have gaps in their competencies. Deficiencies were noted in applying nursing knowledge, skills and professional attitudes when providing nursing care (Seed Global Health, 2019).

Another study conducted with Eswatini nursing educators and clinical practice stakeholders (nurse educators, registered nurses, nurse managers and new graduates) indicated that new graduates were not practice-ready (Dlamini et al., 2014). The nurse managers attributed the lack of readiness for professional practice to inconsistent student clinical supervision. At

the same time, the new graduates felt they had gained substantial theoretical/abstract nursing knowledge. However, they lacked the confidence to perform hands-on invasive clinical skills due to a lack of practice during their educational preparation. As such, they feared harming the patient (Dlamini et al., 2014). Dlamini et al. (2014) recommended the development of a clinical nursing education and supervision framework to employ innovative approaches to ensure quality education and a safe transition to professional practice. However, there is no evidence of how the gap has been addressed, and overall, there is limited research output on nursing education in the country.

Despite the reported concerns and increasing evidence about the effects and benefits of using simulation in nursing education, the Eswatini nursing education system remained unchanged; they still rely on a passive educational strategy, which limits student active participation in their learning and an apprenticeship model, an approach that allows students to gain clinical experience in natural clinical settings (hospitals, clinics and community) (Glen, 2009). Riley (2016) reported that arranging quality clinical learning experiences in traditional clinical settings is increasingly difficult, thus challenging for nursing students to achieve the required competencies. In Eswatini, limited clinical placement sites, which are compounded by high nursing student intakes and other healthcare students who require similar learning opportunities, have compromised the apprenticeship model. Another factor that hinders student learning in the apprenticeship model is the lack of clinical supervision due to the high student ratio to lecturers and a shortage of clinical preceptors. As a result, the graduates are likely to continue to express a lack of confidence in practice due to limited opportunities to develop psychomotor skills and professional attitudes under the current educational strategy. Further repercussions will be compromised patient healthcare outcomes, due to students who have limited opportunities to learn, practice and develop required clinical competencies.

Currently, the Eswatini nursing education institutions lack the capacity to integrate simulation-based training into the Bachelor of Nursing Science programme. However, failure to integrate simulation into the curriculum will cause a deterioration in the quality of nursing education, and there will be public mistrust of the healthcare system. Hence, there is a need

to develop a framework to guide the introduction and sustainability of a simulation-based educational strategy.

1.3 SIGNIFICANCE OF THE STUDY

This study developed a framework for integrating simulation into the Bachelor of Nursing Science programme to complement current clinical education delivery strategies, thus ensuring that nursing students achieve their competencies for professional practice. The framework will serve as a benchmark for nursing education institutions, other healthcare-based professions and clinical practice settings that are willing to use simulation as an educational strategy in Eswatini and internationally.

The gap that was identified is that new graduates lack competencies (Swaziland Nursing Council, 2014; USAID, 2015a, 2015b; Msibi, Nkwanyana and Kuebel, 2020), and educators rely on passive teaching methods (lectures) and the apprenticeship model for clinical education. The apprenticeship model is a recognised useful traditional educational strategy for healthcare science clinical education (Kneebone et al., 2004; Stalmeijer et al., 2009); however, there are conditions to be satisfied. The requirement is that it should occur under clinical educators' guidance (Merritt et al., 2018) with structured supervision, not just exposure to clinical placement (Glen, 2009). The Eswatini nursing education context is faced with limited clinical placements, high student intakes, and supervision concerns, which affect the efficacy of the apprenticeship model. In addition, nurse managers in clinical practice are raising concerns about new graduates' competencies, and they are viewing them as not being ‘work-ready’. At the same time, graduates expressed a lack of confidence due to limited opportunities to practice and develop hands-on clinical competencies.

Implementing this framework in Eswatini might benefit educators, students and patients. One of the key elements that are integral to simulation-based education is the training of the trainers in simulation pedagogies, which supports student-teacher interaction and active learning. The educators will, therefore, have an opportunity to learn new educational practices that will enhance the delivery of clinical education. Also, when simulation is integrated into the nursing and midwifery programme fully, educators will be able to design simulation experiences ranging from simple to complex skills, emergencies and rare patient

situations. Students, as core beneficiaries, will have the opportunity to learn, practice and develop clinical competencies in a safe learning environment.

Improving patient safety is another benefit that can be realised through the integration of simulation into a nursing and midwifery programme. Students will develop their skills in a simulation-based learning environment under guidance, and their performance is evaluated to measure if they have acquired the desired clinical learning outcomes. After that, they can be placed in practice to care for patients rather than practising on them, which might compromise patient safety.

The World Health Organisation, when addressing the aspect of patient safety, recognises simulation as an educational strategy “that has a positive impact on students, educators, and the individuals, groups and communities they care for, as well as on education and health organisations” (Martins et., 2018, p. 1). Jeffries (2021) identified three elements that should be considered as outcomes for simulation: participant/learner, patient and system. These outcomes are central to the goal of nursing education, which is producing competent practitioners to meet public healthcare needs. Also, it supports the mandate of the Eswatini Nursing Council, which is to regulate nursing education and practice to protect the public from unsafe practices. Therefore, it is hoped that this framework will provide information to policymakers and serve as a guide for developing policies that support simulation implementation in nursing and other healthcare professional disciplines.

1.4 PURPOSE STATEMENT

This study aimed to develop a framework for integrating simulation into the Bachelor of Nursing Science (BN Sc) programme in Eswatini. The framework will guide the use of simulation-based education, thus promoting the timely acquisition of the expected nursing knowledge, attitudes and skills for professional practice.

1.5 RESEARCH QUESTION

What evidence and processes can inform the development of a framework to guide nurse educators in integrating simulation into the Bachelor of Nursing Science programme in Eswatini?

1.6 RESEARCH OBJECTIVES

The study objectives were:

- To explore existing literature on best practices of simulation-based education in the educational preparation of undergraduate nursing students locally (Sub-Saharan Africa) and internationally.
- To assess the current state of simulation use in the educational preparation of Bachelor of Nursing Science Students in Eswatini.
- To develop a framework for integrating simulation into the Bachelor of Nursing Science programme in Eswatini.
- To evaluate the framework for clinical utility in preparing Bachelor of Nursing Science Students in Eswatini.

1.7 OPERATIONAL DEFINITIONS

Bachelor of Nursing Science: an academic degree undertaken by persons aspiring to be registered nurses. They acquire knowledge through theoretical learning in classrooms and clinical skills through exposure to skills laboratories and clinical sites to gain experiential learning in preparation for professional practice. The study duration is four years (Swanston and Keilman, 2023).

Best practices: refer to guidelines/ intervention strategies that inform how activities should be done to improve existing outcomes. In addition, they denote the set of standards facilitators should implement to deliver quality simulation experiences (White, 2017).

Clinical education: refers to a field that prepares students to learn and develop competencies for entry to healthcare practice that takes place in a simulation laboratory or a real-life clinical area.

Clinical utility: is a matter of judgment and means an intervention or product is evaluated for its usefulness and fit for its purpose (Smart, 2006), frequently used in the healthcare

fraternity to evaluate a framework's feasibility, relevance and desirability (Moorthie and Harris, 2021).

Curriculum: defined as planned learning experiences intended to be offered in a specified programme (Uys and Gwele, 2005)**.**

Educational strategy: denotes the method used to guide student learning in acquiring the programme objectives**.**

Expert: an individual who possesses knowledge and experience in the field of nursing and simulation education.

Framework: is a set of ideas that can guide the actions and decisions of nurse educators when integrating simulation into the nursing programme.

Healthcare education: educational programmes within the health profession (nursing, medicine) (Nestel et al., 2017).

Inferences are conclusions and interpretations that are made on the basis of collected data in a study (Teddlie and Tashakkori, 2009, p. 250).

A nurse educator: also called a lecturer, refers to faculty or tutors involved in the educational preparation of nursing students in a nursing education institution and clinical practice (Swaziland Nursing Council, 2010).

Nursing student: refers to participants who are actively involved in the acquisition of knowledge and are expected to acquire the competencies for their professional level (Swaziland Nursing Council, 2010).

Programme: refers to a set of courses planned to obtain a particular qualification (Uys and Gwele, 2005), such as the Bachelor of Nursing Science degree, which is offered at an undergraduate level for 4 years in Eswatini.

Simulation: refers to an educational strategy that enables educators to replicate clinical situations in order for students to learn, practice and develop clinical competencies prior to engaging with real patients.

Simulation-based education refers to a pedagogical strategy that imitates real-world clinical situations conducted in the simulation or skills laboratory under the direct supervision of a lecturer/nurse educator/clinical instructor/clinical facilitator (South African Nursing Council, 2021).

Simulation champions: nurse educators trained in the implementation process of simulation pedagogies in order to support other faculty members and coordinate simulation learning activities (Foisy-Doll and Leighton, 2017a).

Simulation facilitator: a trained educator or clinical instructor provides guidance and support to learners before, during, and after a simulation learning experience (Moulton et al., 2017).

1.8 THEORETICAL FRAMEWORK

This study was guided by two theoretical models: the Organisational Elements that Shape Simulation in Nursing (OESSN) (Taplay et al., 2014) and the NLN Jeffries Simulation theoretical model (Jeffries, 2021).

1.8.1 Organisational Elements that Shape Simulation in Nursing (OESSN) Theoretical Model

Taplay et al. (2014) reported that inconsistencies regarding the adoption and integration of simulation as an educational strategy into a nursing programme are common. Therefore, Taplay et al. (2014) developed the Organisational Elements that Shape Simulation in Nursing (OESSN) theoretical model to inform on how organisational cultures influence the adoption and integration of simulation in a nursing institution. Organisational culture refers to the ways in which individuals know and understand the shared values and beliefs of the institution (Taplay et al., 2014). The focus on organisational culture is that academic nursing operates in an organisation/institution. The organisational culture needs to be understood as it has the ability to influence acceptance of change, direct decision-making and the way the people invest their time (Taplay et al., 2014; Foisy-Doll and Leighton, 2017; Leighton et al., 2018; Leighton et al., 2020; Schneidereith et al., 2020).

The basis for employing this model in this study was the evidence which indicates that the successful integration of simulation in nursing education is linked to the organisational culture's readiness to embrace change (Foisy-Doll and Leighton, 2017). Therefore, this model guided the research on the aspects to consider when assessing the current state of simulation use in the educational preparation of Bachelor of Nursing Science Students in Eswatini. Also, the model guided on the variables and constructs to consider when integrating simulation into a nursing education programme.

The OESSN model displays three levels and five components. The model used a concentric circle to demonstrate the three organisational levels that impact integrating simulation into a nursing curriculum: institution, faculty of health and nursing programme. Within each of these levels are guiding philosophies that contribute to the integration of simulation into the programme (Taplay et al., 2014). The five components are (1) nurse leaders, (2) information exchange, (3) physical locale, (4) shared motivators, and (5) scaffolding to manage change. (Taplay et al., 2014). These components are factors that contribute to the extent to which simulation can be adopted and integrated into a nursing programme (Taplay et al., 2014; Foisy-Doll and Leighton, 2017). Figure .11 displays the OESSN theoretical model.

1.8.1.1 The relationship between the levels and the guiding philosophies:

There is a relationship between the levels and the guiding philosophies (Taplay et al., 2014). The guiding philosophies are the mission, vision and values within each level that impact the extent to which simulation is adopted or integrated into the nursing programme (Taplay et al., 2014). These present the perceptions and beliefs that influence behaviour and actions that lead to adopting and integrating simulation into a nursing programme. The guiding philosophies have been useful to nursing leaders (administrators and management teams); they used them as a strategy for change and a way to secure the necessary simulation resources (Taplay et al., 2014).

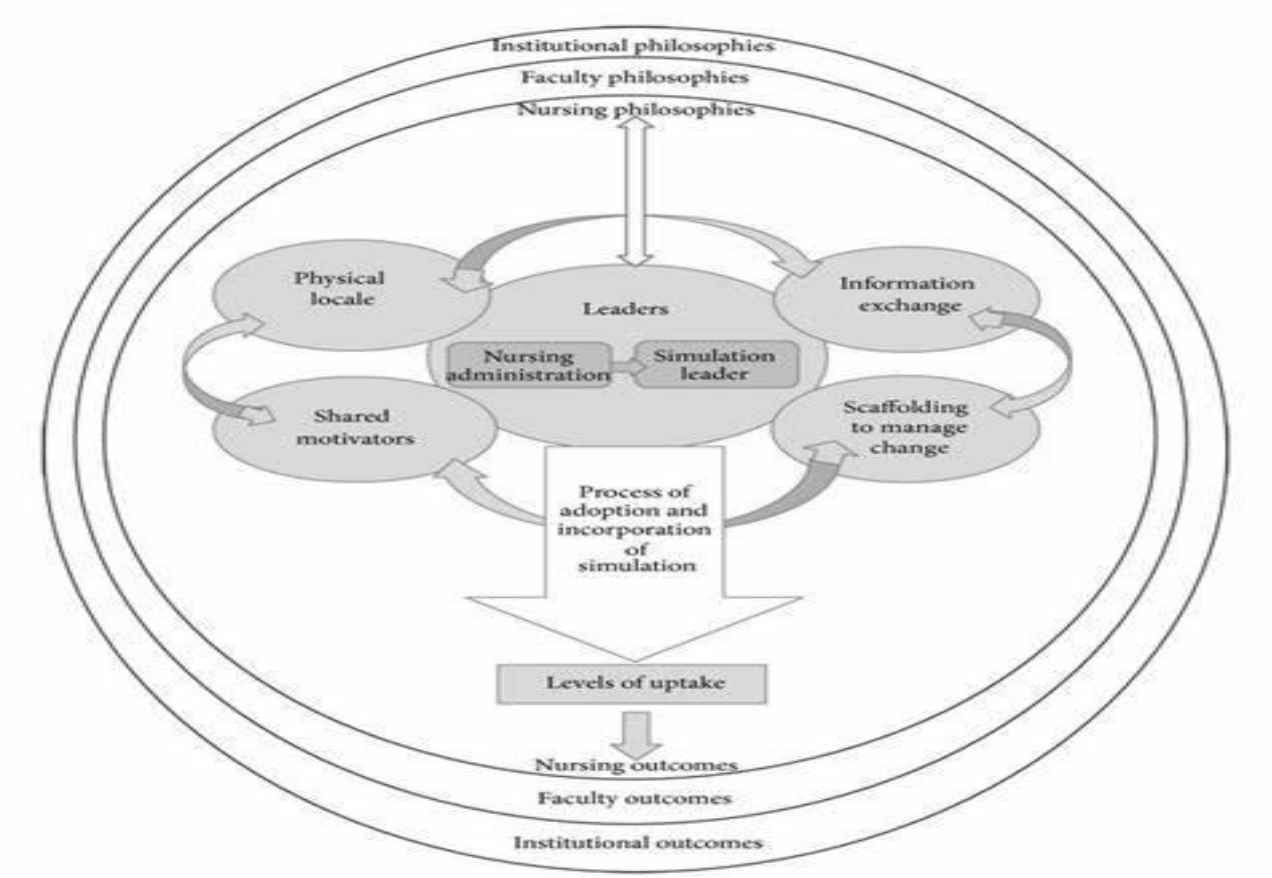


Figure 1.1: The Organizational Elements That Shape Simulation in Nursing (OESSN) theoretical model. Source from (Taplay et al., 2014).

1.8.1.2 Description of the Organisational Elements that Shape Simulation in Nursing Theoretical Model Components

1.8.1.3 Nursing leaders

Nurse leaders refer to the institution management who shared strategic leadership with simulation leaders. Simulation is considered a resource-intensive initiative, so simulation leaders are appointed or volunteers who facilitate the goal of adopting and integrating simulation (Taplay et al., 2014, 2015). The role of the nursing leaders is to support the goal of initiating simulation through engaging multiple strategies: negotiation, navigation and networking. Negotiation entails working with other people at different faculty levels to exchange ideas and secure the required resources. Navigation involves identifying courses that will be mapped with the simulation curriculum. Networking consists of connecting with

internal and external individuals and organisations that have an interest in supporting the goal of simulation (Taplay et al., 2014).

1.8.1.4 Information exchange

It pertains to sharing information about the value of simulation in the educational preparation of student nurses and required resources among nursing leaders, faculty or nurse educators, management at different levels within the institution and collaborative partners. Nurse leaders communicated information about simulation, best practices and findings generated from evaluating students' satisfaction and perceptions of the simulation experience in curriculum meetings, conferences, to small groups, via emails and display of findings. Information exchange is a requirement at the onset and beyond the simulation adoption and integration process to find a fit and maintain its existence in the nursing programme and curriculum and secure resources (Taplay et al., 2014).

1.8.1.5 Physical locale

Infrastructural development is a requirement in simulation; it is used for storage and maintenance of equipment and learning space. Space can be provided by renovating existing structures or building a new one. Taplay et al. (2014) stated that the availability of physical space within the institution is associated with the high possibility of adopting and integrating simulation.

1.8.1.6 Shared motivators

The core motivating factor for institutions is being able to achieve positive student experiences and meeting the goal of nursing education, which is to produce practice-ready professionals (Taplay et al., 2014). Simulation-based education allows students to spend time on interactive learning and to repeatedly practice clinical skills to develop their psychomotor skills in a safe environment without worrying about harming the patient. After the students have refined their skills, they are placed into practice (Taplay et al., 2014). The fear of being left behind with implementing simulation resulted in applying for grants and procurement of equipment that remained in boxes because nobody knew how to use it, what it could be used for and its impact on the staff workload and time (Taplay et al., 2014).

1.8.1.7 Scaffolding as a way to manage change

Scaffolding as a way to manage change involves developing a support structure, a framework for securing resources outside the nursing programme. Strategies include reaching out to external partners and connecting with other internal healthcare programmes (within the faculty) to share resources and expertise. When the simulation initiative is faculty-wide and beyond the nursing programme, it strengthens the adoption and integration process (Taplay et al., 2014).

1.8.2 The NLN Jeffries Simulation Theoretical Model

The researcher used the NLN Jeffries simulation theoretical model to guide the framework development. According to Jeffries (2005) nurse educators recognised simulation as an innovative educational strategy that enables students to become competent in clinical practice using a cost-effective but high-quality manner. However, they lacked knowledge about how to design, implement, and evaluate simulations in nursing education. As a result, in collaboration with the National League for Nursing (NLN) and the Leaderal National Group, Pamela Jeffries developed a framework for designing, implementing and evaluating simulations to guide nurse educators (Jeffries, 2005a). A decade later, an NLN Jeffries Simulation Theory was published based on empirical evidence dated 2005 (Adamson, 2015; Jeffries et al., 2015; Jeffries, 2021). The NLN/Jeffries simulation theoretical model elements are depicted in the picture below, Figure 1.2.

Jeffries (2021) stated that the NLN Jeffries simulation model offers knowledge that can be used to confront issues or aspects to consider on how to plan, prepare, and deliver simulation (Jeffries, 2021). The outlined aspects and the given historical purpose of the NLN Jeffries simulation theory it was deemed appropriate for guiding the processes of developing the framework to guide nurse educators in integrating simulation into the Bachelor of Nursing Science programme in Eswatini.

The NLN Jeffries simulation theoretical model components provided the structural issues that simulation users should consider. Therefore, questions that guided the experts when developing the framework during the Delphi study were developed using the component/concept of the NLN Jeffries simulation theoretical model to ensure it was aligned

with existing simulation evidence. The description of how this theoretical knowledge from the NLN Jeffries simulation model informed and used in this study is described in chapter six, development of the framework phase.

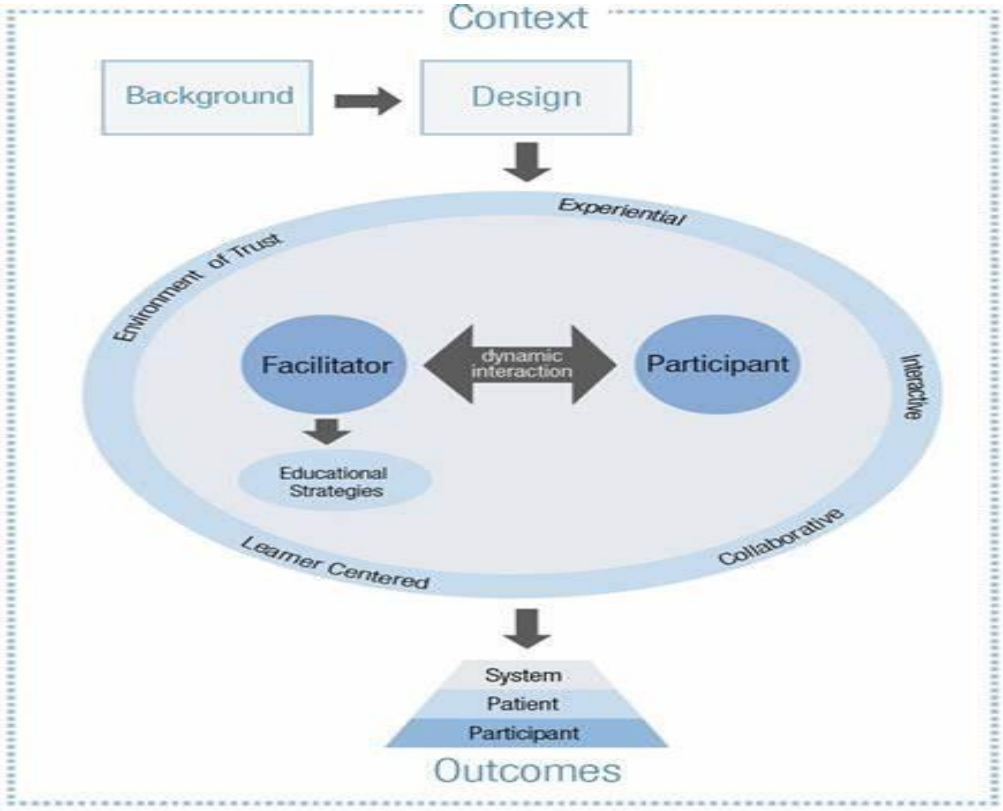


Figure 1.2: NLN/Jeffries Simulation Theory Model. The model image was sourced from https://www.bing.com/images/search?view=detailV2&ccid=eiHHAjzy&id=186F26850854F179A64A9167D2DC358FF8E3BAEB&thid=OIP.

1.8.2.1 Context:

The context refers to the setting where the simulation will be situated, for example, within an academic institution, clinical environment, or simulation centre/laboratory. It also specifies the simulation's designated purpose, whether it will be used for evaluation or as an instruction method (Jeffries et al., 2015; Jeffries, 2021).

1.8.2.2 Background

The construct background takes into consideration aspects that are inherent to the context. These are elements that influence the simulation design; they include (a) simulation goal(s),

(b) expectations/benchmarks, (c) theoretical perspective underlying the simulation experience, and (d) curricular integration. Other vital aspects to consider in the background are time and equipment. It should clearly state how these resources would be allocated to ensure simulation success (Jeffries et al., 2015; Jeffries, 2021).

1.8.2.3 Design

The simulation design informs about aspects that should be established before the actual simulation experience is developed. The preparation process is (a) identifying the learning objectives that inform the content of the scenario, (b) selecting the appropriate fidelity dimensions (physical and conceptual), (c) determining the complexity of the simulation scenario and student support (cueing), and (d) briefing students and debriefing processes (Adamson, 2015; Jeffries et al., 2015). These elements are mandatory when planning simulation experiences (Jeffries et al., 2015; Jeffries, 2021).

1.8.2.4 Simulation Experience

The simulation experience details the environment that enhances quality learning in simulation-based education. The environment should promote (a) experiential learning, (b) collaboration, (c) interactivity, and (d) learner-centredness. The educator/facilitator and the student/learner are equally responsible for maintaining the environment to obtain meaningful simulation learning experiences (Jeffries et al., 2015).

1.8.2.4.1 Facilitator and Educational Strategies

Simulation experiences are influenced by the interaction between the facilitator and the learner (participant) (Jeffries et al., 2015; Jeffries, 2021). The facilitator should possess skills and educational techniques obtained through training to facilitate simulation experiences effectively. Their activities or responsibilities should include planning learning activities, providing feedback using cues and debriefing the student after the simulation experience (Adamson, 2015; Jeffries et al., 2015; Jeffries, 2021).

1.8.2.4.2 Participant

The participant brings modifiable and non-modifiable factors. Modifiable factors affect student preparedness, influenced by educator qualities and student role assignments. Nonmodifiable factors (student attributes) are the age, gender, anxiety level, and self-confidence they bring to the learning environment. All these factors influence the students' learning experiences in simulation (Adamson, 2015; Jeffries et al., 2015; Jeffries, 2021).

1.8.2.5 Outcomes

Outcomes refer to the effect of simulation on participants/students, patients and the system. The participants' outcomes are well defined in the literature; they include whether simulation results in student satisfaction, learning (knowledge, skills, attitudes) and behaviour change. Patient outcomes focus on simulation effects in improving consumers of healthcare services' health and safety, while the system's outcomes examine simulation influences on practices (what change it brings in practice) and cost-effectiveness (Adamson, 2015; Jeffries et al., 2015; Jeffries, 2021).

1.9 ORGANISATION OF THE RESEARCH CONTENT

The thesis consists of eight (8) chapters. An outline of the content is presented in Table 1.1 below to give an overview of this thesis:

Table 1.1. The organisation of the thesis

Chapter	Activity
Chapter 1: Introduction	Introduction and background to the research problem.
Chapter 2: Literature Review	Review of the literature that relates to the research problem.
Chapter 3: Methodology	Description of the methodological research approaches, designs, techniques and tools that guided the research process.
Chapter 4: Scoping Review	Best practices of simulation-based education in the educational preparation of undergraduate nursing students locally (Sub-Saharan Africa) and internationally.
Chapter 5: Survey Study	Assessment of the current state of simulation use in Eswatini.

Chapter 6: Iterative Research Process	Development of a framework for integrating simulation into the Bachelor of Nursing Science programme in Eswatini.
Chapter 7: Delphi Study	Evaluate the framework for clinical utility.
Chapter 8: Overall Summary	Summary, main findings, limitations, recommendations and conclusion.

1.10 CONCLUSION

This chapter introduced the research study, which includes a description of the research problem, the purpose of undertaking this study, how the goals were achieved, and an overview of how the thesis was carried out. The next chapter discusses the literature that relates to the research problem.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

This chapter presents findings from the literature that relate to simulation in nursing. Wentz (2014) stated that a literature review critically appraises related theories and processes in the field of study to inform about what is known and how it is known and illuminates existing gaps. The chapter discusses the history and current trends in simulation, the value of simulation in nursing education, factors influencing the integration of simulation into programmes, and theoretical perspectives.

2.2 HISTORY OF SIMULATION IN HEALTHCARE EDUCATION

Simulation is widely used and recognised as an authentic education strategy in academia and clinical practice (Cunningham, 2010). The use of simulation within healthcare education dates back over 1500 years (Nehring and Lashely, 2009; Owen, 2016). Owen (2016), who compiled an extensive history of simulation in healthcare education, reported an increased reliance on simulation compared to the apprentice-based training model around the eighteenth century (1740). Owen (2016) highlighted that the shift occurred after clinicians realised that the apprenticeship model could not meet the increased demand for skilled health professionals as very few were admitted at a time. Additionally, the clinicians found it strenuous to teach while attending to patients. As a result, simulationbased courses were introduced for students to learn and practice clinical skills (Owen, 2016).

In healthcare education, SBE began in the medical field, followed by nursing (Hayden et al., 2014; Bryant et al., 2020). Simulators were appreciated more than cadavers in learning certain skills, such as tracheal intubation (Owen, 2016). A proposition for including simulation in nursing education was initiated by Lees, an obstetrician, gynaecologist and midwifery leader, in 1874. Lees proposed that each nursing school have simulators for instruction, quick skill testing, and monthly high-stakes examinations (Owen, 2016).

2.2.1 Early Simulators Used in Nursing Education

In 1910, the principal of Hartford Hospital asked a general doll-maker called Martha Junkins Chase (1851-1925) to make an adult human-size doll that exhibited similar features of realism and quality as the play dolls for teaching nursing skills (Owen, 2016). The doll was delivered in 1911 to Hartford and named after the manufacturer's family name, Josephine Chase, known as Mrs Chase (NLN, 2015; Owen, 2016). The same doll is still used to demonstrate and practise various transferable foundational skills (Aebersold, 2018). The skills include bandaging, bathing, wound dressing and injecting (Owen, 2016). Notably, the Chase mannequin has been used for developing psychomotor skills. However, today, all learning domains (cognitive, psychomotor and affective) can be taught using various non-computerised and technologically enhanced simulation modalities (Hall et al., 2017; Miles, 2018; Bryant et al., 2020). While the doll, Mrs Chase, was used to practice various procedures, other simulators, such as Oscar the skeleton, were designed to teach nurses human anatomical features (Elliott, 2000; Owen, 2016). Another popular manikin in nursing education is a human-size doll called Barbara Anne, produced with influence from a nurse tutor called Miss Bedford (1931) (Owen, 2016).

Another static manikin is "Schultz phantom," a generic name for obstetric simulators to teach midwifery skills and gynaecological procedures. This innovation led to several other obstetric simulators invented by Ludwig Knapp (1868-1925), mainly obstetric accessories such as placentas, the baby and the uterus (Owen, 2016). In 1958, another doll maker, Asmund Laerdal, was asked to develop a cardiopulmonary resuscitation (CPR) manikin for mouth-to-mouth resuscitation (Sofer, 2018). The doll's trade name is Resusci Anne (Sexton et al., 2012; Sofer, 2018).

2.3 AUTHENTICITY, FIDELITY AND REALITY IN SIMULATION-BASED EDUCATION

Simulation fidelity refers to the degree of realism of the simulation and the extent to which it imitates real-life situations (Weaver, 2011; Murray, 2014; Al-Ghareeb and Cooper, 2016; INACSL Standards Committee, 2016e; West et al., 2017). Simulation fidelity is achieved through a variety of dimensions: "(a) physical factors such as environment and equipment, (b) psychological factors such as emotions, beliefs, and self-awareness of participants; (c)

social factors such as participant and instructor motivation and goals; (d) culture of the group; and (e) degree of openness and trust, as well as participants' modes of thinking" (Meakim et al., 2013). Simulation fidelity consists of three levels: low-fidelity, medium-fidelity, and high-fidelity (Faulcon, 2015; Kim et al., 2016; Lubbers and Rossman, 2017). The fidelity level must be appropriately selected for a simulation scenario and aligned to the learners' level to achieve the planned educational outcomes (Sando et al., 2013; INACSL Standards Committee, 2016b; West et al., 2017; Chernikova et al., 2020).

2.3.1. High-Fidelity Simulation (HFS)

High-fidelity simulators (HFS) are mannequins that use advanced technology to provide interactive learning experiences to students (Faulcon, 2015). They are computer-based mannequins (Al-Ghareeb and Cooper, 2016) or computerised full-body size mannequin SimMan® (Murray, 2014) that imitate human anatomy (van Vuuren et al., 2018) and any defined clinical disorder (Benner et al., 2010). HFS is further described as a simulator responsive to user demands (West et al., 2017) and highly facilitates the cognitive domain of learning (Kim et al., 2016). However, others view it as a sophisticated educational strategy (Al-Ghareeb and Cooper, 2016) that is challenging to use primarily by untrained educators (van Vuuren et al., 2018). Ferguson et al. (2020) reported that high fidelity is not only limited to high-tech mannequins but also includes human actors (standardised patients).

High-fidelity simulators that facilitate the acquisition of clinical skills include SimMan® or Laerdal's 3G SimMan™ (Chiniara et al., 2013; Edward and Chukwuka, 2020). They have a variety of realistic functions for facilitating learning; they can be programmed to produce verbal and physiologic responses such as vital signs (Wotton et al., 2010; Lapkin and Levett-Jones, 2011; Murray, 2014). Additionally, the HFS interfaces with real-life monitors to display various physiological changes, including vital signs, oxygen saturation, electrocardiogram readings, and central venous pressures (Cunningham, 2010). These features edify realism and enable students to practice and learn skills transferable to clinical practice (Wotton et al., 2010; Al-Ghareeb and Cooper, 2016), such as critical thinking and safely managing rare and high-risk/emergency conditions (Murray, 2014).

2.3.2. Medium-Fidelity Simulation (MFS)

Medium-fidelity simulation modalities enable students to learn more complex skills than low-fidelity simulation (Alconero-Camarero et al., 2021). MFS aims to facilitate the learning of problem-solving skills, enhancing sound reasoning and skill development (Alconero-Camarero et al., 2021). Examples of MFS are human patient fidelity simulators developed by Laerdal called Megacode^{KM} with VitalSim; they are fully-body mannequins with embedded software (Chiniara et al., 2013; Edward and Chukwuka, 2020). Unlike the high-fidelity mannequins, the physiological reactions displayed by the medium fidelity simulators are limited to “palpable pulse and blood pressure on one arm”, sounds include “breath sounds, coughing, vomiting, groaning and one-syllable words (Levett-Jones et al., 2011, p.2). Ntlokonkulu et al. (2018) describe MFS as task trainers that could teach students normal and abnormal breaths, heart and bowel sounds. They can also be used to perform foetal heart sound assessments, catheterisation, nasogastric tubing, enemas, injections and intravenous infusion (Cunningham, 2010). MFS lack fine-tech realism (Ntlokonkulu et al., 2018), such as eye and chest movements (Seropian et al., 2004). Moreover, the MFS can afford students more experiential learning experiences even though they cannot respond to interventions, as does the HFS (Cunningham, 2010; Lapkin and Levett-Jones, 2011; Brady et al., 2015).

2.3.3 Low-Fidelity Simulation (LFS)

Low-fidelity simulation is the longest-used type of simulation within the nursing profession (Olson et al., 2018). Low-fidelity simulators are non-automated, with no software embedded to produce physiological changes (Saqe-Rockoff et al., 2019). They are feasible when there is limited time and space to store them (Nippita et al., 2018) and financial constraints (Murthy et al., 2020). Examples of the long-used low-fidelity simulators include Oscar the skeleton, multiple task trainers, anatomical models, role-plays, full-body static manikins-Mrs Chase (Nehring and Lashely, 2009), and Resusci-Anne, all of which can be used along with standardised patients (Olson et al., 2018). Another low-fidelity model by Laerdal is MamaNatalie^{R} (Angelina et al., 2021), which is used to educate midwives on birth-related processes.

Even though LFS produce the lowest degree of realism, they effectively promote acquiring various clinical skills (Fieux et al., 2021). Furthermore, in a randomised controlled trial study, Fieux et al. (2021) determined the impact of LFS in improving students' knowledge and skills in assessing and diagnosing middle ear disorders using an otoscopy. They reported that the use of LFS effectively complements traditional education methods. Similar conclusions were reached by Murthy et al. (2020), who indicated that it provides an opportunity to learn technical and safety skills before performing them on patients at an affordable cost. Further evidence shows that it is less costly and works with minimum staffing (Saqe-Rockoff, Ciardiello and Schubert, 2019). LFS has also been used to teach pre-licensure students about patient safety competencies (House et al., 2016). Brauneis et al. (2021) reported that LFS effectively teaches graduate prelicensure students safe medication administration practices. However, a gap exists in the literature concerning using LFS to foster patient safety skills, and nurse educators should review their curricula and integrate patient safety throughout (House et al., 2016).

2.3.4. Comparison of the Effectiveness and Impact of the Simulation Fidelity Levels

Evidence from the literature has compared the simulation fidelity levels to determine which best improves the acquisition of educational programme outcomes. For example, in a randomised three-arm trial study, Brady et al. (2015) evaluated the effectiveness of the different simulation fidelity levels (LFS, MFS and HFS) among midwifery students in acquiring and developing vaginal examination skills. Their results showed that high-fidelity simulators produced better outcomes than medium-fidelity and low-fidelity modalities (Brady et al., 2015).

Direct comparisons of the effect of low and high-fidelity simulation experiences are recovered from the literature. Lee et al. (2008) found no statistically significant difference in the capacity of LFS and HFS when assessing the clinical performance of intensive care paramedics. In a randomised controlled trial study, Nippita et al. (2018) examined senior nurse practitioner interns' knowledge, skills and attitudes in inserting intrauterine devices using LFS and HFS. The methods were found to be comparable. Nicolaides et al. (2020), whose study compared the impact of low and high-fidelity simulation in facilitating team

performance among medical students, also found no statistical difference in outcomes achieved through these modalities.

In a randomised cross-over trial study, Murthy et al. (2020) in Rwanda also compared the effectiveness of high-fidelity and low-fidelity simulation among surgery or obstetrics and gynaecology residents using multiple variables, including skills acquisition, confidence and safety in diagnosing breast cancer through biopsy. The findings showed no statistical significance between the mediums of learning (Murthy et al., 2020). Cunningham (2010) claims that Laerdal's Nursing Anne™ is a sufficient technology when integrated with low-fidelity simulation.

Another variable of interest that has been validated is whether simulation improves student satisfaction. Alconero-Camarero et al. (2021) compared medium-fidelity and high-fidelity levels to examine which contributes to higher satisfaction among nursing students. Medium-fidelity simulation was more satisfying than high-fidelity simulation (Alconero-Camarero et al., 2021). In contrast, in a randomised controlled trial study, Baptista et al. (2016) reported that student nurses were more impressed by the degree of realism experienced in high-fidelity than in medium-fidelity experiences. They found high-fidelity simulation more satisfying and remarkable in recognition and decision-making skills than medium-fidelity simulation. However, the challenge with HFS is that educators and students require skills to provide and acquire meaningful learning respectively (Alconero-Camarero et al., 2021).

The literature has shown that in some settings, low and medium-fidelity simulators were preferred over high-fidelity simulators despite their availability. A study conducted in South Africa's private colleges showed that nurse educators relied more on medium-fidelity and low-fidelity than high-fidelity simulators despite having high-fidelity simulators (van Vuuren et al., 2018). Similar findings were reported by Chabrera et al. (2021). Thurling (2017) attributes the highlighted practice to the lack of skills to integrate high-fidelity simulators into the nursing curricula and the fear of using technology.

Some studies have informed about the cost-effectiveness of the different simulation equipment fidelity levels. For example, Lapkin and Levett-Jones (2011) conducted a cost-utility analysis study to determine the cost-effectiveness of MFS and HFS in achieving the

following outcomes: student satisfaction, clinical reasoning, and knowledge attainment. They found that both modalities equally lead to the acquisition of these skills. Moreover, the MSF uses one-fifth of the cost of paying for the HFS resources (Lapkin and Levett-Jones, 2011). Low-fidelity modalities are inexpensive and can provide immersive experiences (House et al., 2016), followed by medium-fidelity simulation, which is also recommended for resource-limited settings (Brady et al., 2015). Such findings help NEIs to decide which type of fidelity to acquire. (Cunningham, 2010). However, Teteris et al. (2012) suggest the need for further research "to compare the cost-effectiveness of simulated learning experiences to lower fidelity and less expensive interventions" (p.137).

2.4 THE VALUE OF SIMULATION IN NURSING EDUCATION

Current evidence highlights that simulation is key to producing competent healthcare professionals (Bryant et al., 2020). Cant and Cooper (2017a) agree that simulation is a pedagogical method for preparing undergraduate students to become nurses. It can be planned to present a variety of clinical care situations (Larue et al., 2015; Servotte et al., 2019), including rare cases that are unethical to practice on patients (Gaba, 2004; Eyikara and Baykara, 2017). Further, it is intended for learners to gain clinical experiences similar to those experienced in real-life clinical settings (Jeffries, 2005b) in a non-threatening learning environment (Robinson and Dearmon, 2013). Faulcon (2015) states that simulation enables nurse educators to assess students' level and ability to achieve the programme outcomes timeously.

Jeffries (2005a) states that simulation is meant to teach nursing students critical thinking skills, which is seen as lacking in graduated nurses. Zigmont et al. (2011) concur with the latter, adding that it provides unrestricted hands-on clinical practice experience. They further argued that it serves as a robust rationale for healthcare institutions to invest in simulation-based education (Zigmont et al., 2011).

2.4.1 Benefits of simulation in clinical education

Simulation in academia was initially viewed as an educational strategy for techno-savvy educators; however, it is now engraved in all nursing education programmes (Aebersold,

2018). Simulation-based learning has moved beyond the level of task training (Bryant et al., 2020); it can now offer teaching and learning opportunities that mimic more realistic clinical situations due to technological advances (Jeffries, 2005a; Weller et al., 2012). In addition, it facilitates the teaching and learning of non-technical skills such as problem-solving and clinical reasoning (Jeffries, 2005). It has changed clinicians' perspectives on student nurses' work readiness, given its ability to provide authentic learning opportunities (Parker and Grech, 2018). However, the full benefits of simulation will be realised once simulation-based education is systematically integrated into the nursing education system globally (Schatz et al., 2013).

Simulation-based education is described as an "experiential, student-centred pedagogical approach" (Billings and Helstead, 2016, p.794) and is effective in interprofessional teams (Bryant et al., 2020). Furthermore, simulation provides students with opportunities to engage in practices that lead to developing problem-solving and clinical reasoning skills (Jeffries, 2005b). Gaba (2004) claims it fosters teaching practices that enable learners to conceptualise relations and learning dynamics (knowledge, skills, and attitudes). Aside from benefiting the student, it benefits the healthcare system; Larue et al. (2015) stated that it frees up clinical placement spaces and decreases the workload of clinicians.

The literature also recognises simulation as an effective teaching and learning strategy (Robinson and Dearmon, 2013), capable of overcoming the apprenticeship model limitations (Owen, 2016). It promotes delivering high-quality clinical experiences (Hayden et al., 2014; Persico, 2018), enables educators to evaluate learning outcomes, and continuously assesses clinical competencies in practice (Gaba, 2004). In addition, it is founded on adult learning principles; students actively participate in their learning and reflect on their practice (Sexton et al., 2012).

The drivers of using simulation-based education are deliberated in the literature. Simulation-based education is deemed a teaching and learning strategy that promotes acquiring skills, knowledge, and attitudes more effectively than other traditional clinical learning strategies, which are characterised by opportunistic learning experiences (Weller et al., 2012). It also allows students to enter real-life practice with already-developed cognitive, psychomotor, and affective skills (Faulcon, 2015), thus addressing the learners' concern about being

attached to clinical practice without adequate preparation (Servotte et al., 2019). Another associated driver is that it provides opportunities for students to receive standardised learning experiences and authentic teaching and practising of clinical skills without fear of injuring a patient (Cunningham, 2010).

2.4.2 Patient Safety

The prioritisation of patient safety has increased the demand for the uptake of simulation in nursing education (Gaba, 2004; Durham and Alden, 2008; Zigmont et al., 2011; House et al., 2016; Briscoe et al., 2017; Seam et al., 2019; Seaton et al., 2019; Akhter et al., 2021b). Simulation is considered an educational tool effective in improving patient safety (Durham and Alden, 2008; Klipfel et al., 2014; House et al., 2016). Patient safety is accomplished by teaching and practising clinical skills in a controlled environment that allows mistakes to happen other than committing such on patients who can suffer injuries, permanent disabilities, and death (Eyikara and Baykara, 2017). In simulation-based education, learners, through deliberate practice, can prepare for clinical placement and hone their clinical skills without the risk of harming a live patient (Tsuda et al., 2015).

Other factors that drive the use of simulation are re-emerging challenges that affect the nursing profession and clinical teaching and learning. Examples of re-emerging challenges include increasing demand to train more nurses and difficulty finding quality clinical placements (Hayden et al., 2014; Oudshoorn and Sinclair, 2015), lack of clinical educators/preceptors and a shortage of clinical sites to accommodate all the students (Larue et al., 2015) due to surging student intakes (Bvumbwe and Mtshali, 2018). The challenges demand new methods for facilitating the acquisition of clinical competencies (Helgesen et al., 2016) amid the rising scarcity of patient-based practical experience and the need to produce competent nurses (Weller et al., 2012; Nestel et al., 2017).

2.5 THE INTEGRATION OF SIMULATION INTO AN UNDERGRADUATE NURSING PROGRAMME

The literature indicated that simulation is effective when integrated into an undergraduate nursing curriculum (Weller et al., 2012; Aebersold, 2018). Similarly, the World Health Organisation considers simulation as a valuable strategy when integrated across nursing

and midwifery courses (Martins et al., 2018). Howard et al. (2011) reported that students and faculty members perceived the need to integrate simulation across their undergraduate nursing programme (Bachelor of Science in Nursing) following a simulation experience with high-fidelity simulators. However, some institutions have not done enough to meet accreditation standards (Khamis et al., 2016; Thurling et al., 2016). Khamis et al. (2016) argue that many studies have focused on frameworks for implementing simulation experiences and equipment availability instead of educational packages for educators to meet the goal, as the availability of simulators (mannequins) is not the only essential element. Thurling et al. (2016) supported the need to guide educators and alluded that integrating simulation into a curriculum requires a plan.

The literature suggests that focusing on faculty development is the key to integrating simulation across programmes. For example, Kardong-Edgren et al. (2008) reported that initially, their institution only used SBE in a course; however, with the availability of a trained faculty, increasing knowledge and experience with simulation among faculty members, it was integrated into an undergraduate nursing curriculum.

2.6 FACTORS INFLUENCING INTEGRATION OF SIMULATION IN INSTITUTIONS

Readiness for integrating simulation is bound to the institutional/organisational culture (Taplay et al., 2014, 2015; Foisy-Doll and Leighton, 2017a). Organisational culture refers to the traditions (beliefs and values) shared by all group members in an institution (Taplay et al., 2014). The organisational culture of nursing education institutions has long been established around traditional teaching, research, and other academic activities (Taplay et al., 2014; Faulcon, 2015). The academic culture has since evolved, requiring the incorporation of technology (Jeffries, 2005b). However, change is difficult to attain, and such is influenced by the organisational culture and socio-economical and contextual factors (Dalley et al., 2008; Zhang et al., 2011). Given the complexities around the organisational culture, careful consideration is required to ensure an initiative receives the attention of relevant stakeholders (internal and external to the institution) to ascertain its sustainability (INACSL Standards Committee, 2016c; Nestel et al., 2017).

Simulation learning in healthcare education is no longer new (Aebersold, 2018); it is maturing and growing exponentially (Nestel et al., 2017). However, embracing change is “not a linear process”; it comes with new expectations (Dalley et al., 2008, p.67). For example, programme and curriculum reviews are required (Wilford and Doyle, 2006; Khamis et al., 2016), including establishing a simulation working team and preparing and running simulation scenarios (Taplay et al., 2015; Thurling et al., 2016). Additionally, the faculty needs financial support to fund their training and be released from heavy workloads to have time to engage in curriculum integration (Howard et al., 2011). Moreover, failure will likely happen without organisational readiness for culture change (Leighton et al., 2018). The organisational culture shapes and drives the process of integrating simulation (Taplay et al., 2015). The recommended strategy is to assess the organisational culture readiness for simulation (Foisy-Doll and Leighton, 2017a; Leighton et al., 2020). Foisy-Doll and Leighton (2017a) developed the instrument Simulation Culture Organisation Readiness Survey (SCORS) to assist implementors in determining the extent to which simulation is used and the willingness to integrate it into a nursing programme.

The rationale for the SCORS tool, according to Schneidereith et al. (2020), is to guide leaders preparing to integrate or advance their simulation programme. That includes knowing the state of readiness to integrate simulation-based education in an institution, which could be ascertained through assessing the (a) defined need and support for change, (b) readiness for culture change, (c) state of resources, and (d) sustainable strategies to embed culture change (Foisy-Doll and Leighton, 2017a; Leighton et al., 2020).

2.6.1 Defined need and support for change

The initial steps to simulation appear challenging to faculty and supporting staff (Kardong-Edgren et al., 2008). It is paramount to investigate the institution’s desire to change its organisational culture (Foisy-Doll and Leighton (2017); Taplay et al., 2014). Foisy-Doll and Leighton (2017) and Nehring et al. (2013) also alluded that change comes with resistance. Gaba (2004) reported that the opposition to change is due to the fear of losing the organisational cultural system. Therefore, assessing the need for simulation-based

education is vital to determine the acceptance and motive towards change (Foisy-Doll and Leighton, 2017a).

The literature has discussed factors that indicate an institution has defined the need to integrate simulation and support the change towards embracing simulation-based education (SBE). They include ensuring that the goals of SBE are evident in the organisation's mission, vision, philosophy and strategic plan (Taplay et al., 2014; Foisy-Doll and Leighton, 2017a; Schneidereith et al., 2020). Other essential indicators include the availability of written commitment from the management to provide financial support for the advancement of SBE, evidence of using simulation as a teaching modality, including the availability of faculty members/educators who articulate the need and commitment to utilising it (Taplay et al., 2014; Foisy-Doll and Leighton, 2017a, 2017b; Schneidereith et al., 2020).
Some institutions are utilising simulation but have challenges meeting all these conditions. A study by Moabi and Mtshali (2021) reported a commitment from educators to utilise simulation; however, there were challenges with support for change characterised by the management's lack of commitment to support the learning strategy. Their plight included the absence of documented statements regarding this teaching modality in the institution's mission, vision, and philosophy and the lack of planned finances to support simulation-based education (Moabi and Mtshali, 2021). Schneidereith et al. (2020) argue that the lack of financial support indicates a misalignment of the institution's strategic plan with SBE goals.

Challenges regarding management commitment to support simulation-based education have been reported by Awogbemila (2018), stating that such factors hindered educators from integrating simulation-based education into the curriculum. Therefore, the willingness of educators alone is insufficient to achieve a successful curriculum integration without management support (Howard et al., 2011). Also, the lack of shared goals and vision leads to the failure to sustain simulation-based education at effective levels (Leighton et al., 2020).

2.6.2 Readiness for Culture Change

The success of simulation-based education requires a culture change (Foisy-Doll and Leighton, 2017a). However, embedding simulation into existing organisational cultural systems is challenging (Gaba, 2004). Some scholars emphasise basing efforts on

leadership and management theories to effect culture change (Institute of Medicine, 2011; Taplay et al., 2014; Foisy-Doll and Leighton, 2017a; Wijk et al., 2021). Some renowned authors claim that culture change is achieved through “effective collaboration and communication within the organisation” (Foisy-Doll and Leighton, 2017a, p. 6). They further indicated that culture change is a process, as is integrating simulation into an educational programme, meaning both are not one-time events (Foisy-Doll and Leighton, 2017a). As such, institutions are encouraged to introduce it gradually into their programmes (Alexander et al., 2015).

The organisational culture is central to the success of simulation-based education in an institution (Nestel et al., 2017). Taplay et al. (2015) established how organisational culture impacts simulation adoption and integration. They developed a framework that helps explain how simulation can be systematically adopted and integrated into a nursing curriculum. The framework is called the seven-phased process: (a) securing resources, (b) nursing leaders working in tandem, (c) getting it out of the box, (d) learning about simulation and its potential for teaching, (e) finding a fit, (f) trailing the equipment, and (g) integrating it into a curriculum (Taplay et al., 2015). Institutions that meet some of these elements are referred to as mid-users of simulation, while those who barely succeed in any of the phases are low-uptake users (Glaser, 1965). However, high-uptake users successfully progress through the stages (Foisy-Doll and Leighton, 2017a).

More evidence on vital elements that facilitate culture change in an institution was reported; it includes the (i) availability of simulation champions, (ii) professionals who are skilled (S), knowledgeable (K) and possess positive attitudes, (A) about simulation-based education, (iii) availability of researchers, (iv) management who is supportive of innovative interventions, (v) technology proficiency and (vi) librarians (Foisy-Doll and Leighton, 2017b, 2017a).

Foisy-Doll and Leighton (2017a) stated that success in integrating SBE is bound to culture change. The process towards culture change seems to have begun in some countries within Southern Africa, as evidenced by studies that have established the state of simulation use or the extent to which it is integrated into healthcare education (Awogbemila, 2018; Swart, Duys and Hauser, 2019; Moabi and Mtshali, 2021). Two of these studies (Awogbemila, 2018;

Moabi and Mtshali, 2021) used the Foisy-Doll and Leighton (2017a) SCORS instrument to assess the institutional readiness for SBE. The settings used simulation but were reported to lack some factors that predict the successful integration of simulation (Foisy-Doll and Leighton, 2017a). Some of the limiting factors included the lack of trained/credentialed educators possessing simulation skills, knowledge and attitude (SKA), lack of simulation champions, lack of librarian personnel and graduate researchers and no technology-proficient staff members (Awogbemila, 2018; Swart et al., 2019; Moabi and Mtshali, 2021). While all shared similar challenges, Swart et al. (2019) also reported on the absence of researchers focusing on simulation-based education and the non-existence of accredited simulation training programmes in South Africa. On the other hand, Moabi and Mtshali (2021) underscored that management support is critical in ensuring the effective integration of simulation-based education.

2.6.3 Time, Personnel, and Resource Readiness

Successful adoption or integration of simulation into a programme requires an organisational culture receptive to change to support its process (Foisy-Doll and Leighton, 2017a). FoisyDoll and Leighton (2017a) highlighted the priority areas that demonstrate culture change, which facilitates integrating simulation into the education system: the availability of time, personnel, and resources. Early research has also valued the availability of physical/equipment resources and human resources (trained educators) to successfully integrate simulation into a healthcare programme (Issenberg, 2006). However, integrating simulation into a curriculum requires costs to secure the identified resources (Riabtseva et al., 2015; Taplay et al., 2015).

Simulation is not a novelty in nursing education (Issenberg, 2006; Nestel et al., 2017; Aebersold, 2018). However, various settings worldwide still face challenges in embracing the educational strategy (Taplay et al., 2014). In resource-sufficient settings, the challenge was the lack of educators with a simulation training background; hence, the low uptake and lack of motive to embed it into the curriculum (Kardong-Edgren et al., 2008; Adamson, 2010). The associated causes of low uptake also included being overwhelmed by sophisticated technology and ageing faculty with limited digital technology proficiencies (Kardong-Edgren et al., 2008). In most countries in the sub-Saharan context, securing all the resources

needed to integrate simulation remains challenging; the desired resources include trained faculty, financial support and the availability of protected time (Swart et al., 2019; Moabi and Mtshali, 2021; Tjoflåt et al., 2021).

Securing funds to procure resources requires a plan. Seropian et al. (2004) emphasised the importance of having a sound vision and business plan to encourage decision-makers' buy-in. The decision-makers and institutional and regional leaders bear the responsibility of ensuring the availability of needed resources, which may include renovation or construction of the infrastructure, allocating building premises, purchasing equipment, faculty development and training cost, and curriculum redesign (Seropian et al., 2004; Riabtseva et al., 2015; Taplay et al., 2015). Taplay et al. (2015) indicated that securing finances for funding the physical infrastructure is the most challenging activity. Foisy-Doll and Leighton (2017a) alluded that it depends on the willingness of the institution to embrace cultural change. If willing, they can succeed by reviewing the processes they use in allocating “time, personnel and resources” (Foisy-Doll and Leighton, 2017a, p. 8). Infrastructure resources are once-off investments (Riabtseva et al., 2015; Taplay et al., 2015).

2.6.4 Sustainable Education Development to Embed Culture

Satisfaction with SBE in undergraduate healthcare programmes (medical and nursing education) is very high (Nestel et al., 2017; Bryant et al., 2020). However, sustainability concerns many institutions (Taplay et al., 2014), and such has been attributed to the lack of planning, thus leading to failure to benefit from simulation-based education (Leighton et al., 2020). Associated factors that contribute to such failures include the absence of a shared strategic vision, unclear goals of simulation (no defined need), the lack of metrics for measuring outcomes and success, lack of a financial (budget) plan for education and training, and lack of a sustainability plan for managing simulation-based education expenses (Nestel et al., 2017; Leighton et al., 2020). Moreover, much of the associated stress stems from the fact that most funding tends to be a once-off deal, making the institution wonder how to meet the maintenance costs and buy commodities and additional equipment (Taplay et al., 2014; Riabtseva et al., 2015; Leighton et al., 2018; Leighton et al., 2020).

Sustainable practices should be engraved into organisational culture (Foisy-Doll and Leighton, 2017). Strategies for ensuring the sustainability of simulation-based education include (a) collaboration with other institutions to maximise the use of simulation equipment and resource management, (b) encouraging transdisciplinary methods to increase simulation use among students, (c) ensuring ongoing training of educators on simulation techniques, (d) development of a long-term plan for simulation, (e) base simulation practice and operation on evidence, (f) stakeholder involvement to maximise uptake, (g) sharing of equipment and resources with other institutions, (h) allocation of permanent work positions, such as simulation coordinators and director's, (i) availability of simulation trained—certified educators and technicians (Riabtseva et al., 2015; Foisy-Doll and Leighton, 2017a; Nestel et al., 2017). Additionally, the sharing of outcomes and the involvement of educators, clinicians, and management in decisions involving simulation-based education make the programme thrive (Foisy-Doll and Leighton, 2017a). Moabi and Mtshali (2021) reported a gap in implementing sustainability practices, saying outcomes sharing and involvement of clinicians in decisions concerning SBE were minimally practised.

2.6.5 Barriers and Facilitating Factors to Integrating Simulation into a Curriculum

Although simulation-based education has been used for centuries within the healthcare profession (Owen, 2016; Nestel et al., 2017), to some, it is in its infancy (Bryant et al., 2020) or underutilised (Bogossian et al., 2018). Knowing the hindrances to implementing simulation into a programme helps avoid pitfalls (Adamson, 2010) and initiates a call for intervention (Ferguson et al., 2020).

2.6.5.1 Costs

Concerns about finances are the leading barrier to the uptake of simulation-based education globally. Hosny et al. (2017), in their qualitative study involving 17 experts, including programme directors and surgeons interested in surgical education, and 20 residents from five countries (the United States of America, the United Kingdom, France, Canada and Japan), categorised the barriers into classes. They included high personal (simulation training) and institutional (human and material resources and infrastructure) costs, practicality and motivation. Ferguson et al. (2020) argued that the lack of evidence regarding

how simulation improves patient outcomes could marginalise financial support for simulation-based education.

A hefty budget is indeed needed to procure the simulators, train faculty members, maintenance costs, hire and pay additional staff, and infrastructure development (simulation laboratory) (Adamson, 2010; Hosny et al., 2017; Abdelmegid et al., 2020). However, proper economic evaluation, which includes alternative benefits of planned educational intervention, guides leaders (Lin et al., 2018). Integrating simulation-based education in nursing or medical programmes is beneficial as it offsets the costs incurred through human errors and the risk to patient safety (Gaba, 2004; Durham and Alden, 2008; Briscoe et al., 2017; Riaz, 2019). The costs of initiating a simulation programme can seem unattainable. However, the healthcare profession can no longer hold on to the belief that “wisdom and clinical experience alone will produce safe, confident and effective providers” (Seropian et al., 2004, p.170).

Recommendable strategies that facilitate the uptake of simulation, mainly the financial costs, have been discussed in the literature. They include deciding the extent to which an institution embeds simulation into a curriculum, as that depends on the availability of resources for that particular institution/setting (Weller et al., 2012; WHO, 2013). The institution must decide which programme outcomes to achieve with simulation (Seam et al., 2019). Essentially, the institution must develop a plan for integrating simulation into the curriculum as it is not a once-off event (Riabtseva et al., 2015).

Evidence also supports conducting a cost analysis to buy cost-effective equipment, such as medium and low-fidelity equipment and involving human actors (standardised patients) (Lapkin and Levett-Jones, 2011; Briscoe et al., 2017; Mücke et al., 2020). Another cost-effective strategy is sharing resources and expertise between institutions (Taplay et al., 2014; Watts et al., 2020) rather than choosing nothing (McLaughlin et al., 2010). Money to support the commitment to simulation-based education can be sourced through grants and private donors (Adamson, 2010). In addition, simulation equipment costs can be made available for the entire health profession groups in the country or an institution, and the other institutions can be charged some fees to utilise the resources (Nehring et al., 2008). Another

viable option includes conducting research, disseminating the findings, and developing linkages with simulation equipment manufacturing companies (Nehring et al., 2013).

Other suggested ways to obtain funding include affiliation with an organisation interested in simulation-based education, such as the International Nursing Association for Clinical Simulation and Learning (INACSL), the Society for Simulation in Healthcare (SSH), the Society in Europe for Simulation Applied to Medicine (SESAM), and the International Paediatric Simulation Society (IPSS) (Nestel et al., 2017). Benefits for affiliation are available for individuals, educational institutions, Nursing Council Boards and cooperatives; they include access to current evidence, sharing of best practices, publications in journals, research grants, workshops and educational resources (Kardong-Edgren et al., 2012; Nestel et al., 2017).

2.6.5.2 Support from institutional management (deans and directors)

The lack of institutional management and leadership support is another significant barrier (Ferguson et al., 2020; Moabi and Mtshali, 2021), which hinders willing educators from integrating simulation (Thurling, 2017). The lack of support from management is attributed to limited awareness of the value of simulation-based education in achieving student learning outcomes (Ferguson et al., 2020). Similarly, others argue that it is associated with a lack of familiarity with simulation design, implementation, evaluation and instruction methods for improving student learning (Faulcon, 2015; Shah et al., 2023).

Experts in simulation-based education highlighted that the success of a simulation programme is dependent on the management or institution’s leaders' commitment to supporting this educational modality (Bryant et al., 2020). Adamson (2010) indicated that support from faculty members and administrators (management) facilitates, strengthens, and promotes simulation implementation in nursing education institutions. Furthermore, management support is needed as the programme expands (Hart et al., 2017) and with changing curriculum needs (Livesay and Lawrence, 2018; Leighton et al., 2020). Other sources said that management buy-in is essential in ensuring the availability of simulation resources and infrastructure (Ferguson et al., 2020).

Moabi and Mtshali (2021) stated that management should create an enabling system to embed simulation-based education and learning. Similarly, Leighton et al. (2020) said institutions should develop a sustainable plan to prevent failure and to continue with the goal of simulation-based education. Taplay et al. (2014) suggested that management or leaders should work with simulation coordinator(s) (shared leadership) to organise simulation resources and facilitate the development of a strategic vision and mission that supports the integration of simulation into the curriculum.

2.6.5.3 Human Resources: Faculty Development

Personnel or human resources with expertise in simulation pedagogies are critical to the success of simulation-based education (Schneidereith et al., 2020; Hernandez-Acevedo, 2021). Simulation facilitators/educators are responsible for guiding the entire levels of the simulation (before, during and after) learning experience (Boese et al., 2013; Franklin et al., 2013; Meakim et al., 2013; Moulton et al., 2017; Morse et al., 2019). Therefore, a facilitator must be an individual who is knowledgeable and has acquired formal training (Franklin et al., 2013).

Simulation facilitators are not essential in simulation-based education; they are incorporated in the International Nursing Association for Clinical Simulation and Learning (INACSL) simulation standards of best practice, published as Simulation Standard V: Facilitator (Boese et al.,2013) and described in the NLN Jeffries simulation theory (Jeffries et al., 2015). Also communicated is how they execute their roles through Simulation Standard IV: Facilitation (Franklin et al., 2013). Moulton et al. (2017) stated that novice simulation facilitators have challenges meeting the facilitator standards without formal training.

Simulation experts/qualified facilitators are required to maximise the effectiveness of achieving the programme outcomes and realisation of simulation potential (Faulcon, 2015; Munangatire and Naidoo, 2017; Li, Petrini and Stone, 2018; Morse et al., 2019; Abdelmegid et al., 2020). Morse et al. (2019) also underscored the importance of having a competent simulation facilitator in academia and clinical practice settings; they argue that it maximises learning. In a study by (Christiansen et al., 2015), participants (students) emphasised the value of having a knowledgeable facilitator, saying they are necessary for meaningful

learning. However, the lack of expertise in simulation pedagogies negatively affects student learning. In a study by Ferguson et al. (2020), participants (educators) after training in simulation use reported that the simulation scenarios they were using were poorly developed, lacked validity, misaligned with student outcomes, not based on simulation philosophical underpinnings and aspect of debriefing not fully incorporated.

2.7 THEORIES AND FRAMEWORK(S) IN SIMULATION-BASED EDUCATION

Applying the relevant educational theory or theories is crucial in achieving the desired simulation-based education outcomes (Taylor, 2004). Theories help to challenge cultural practices and provide educators with a guide to developing meaningful simulation experiences (Nestel and Bearman, 2015; Nestel et al., 2017; Jeffries, 2021). Notably, simulation-based education has long been used in healthcare education but not as a "specialist practice" (Nestel and Bearman, 2015, p. 351). As such, it is common for educators to base their teaching methods on theories without understanding their underpinning principles, mainly when the educator is not a professional educator (Nestel and Bearman, 2015).

Various educational learning theories are compatible with simulation-based education (Taylor, 2004; Rutherford-Hemming, 2012b; Nestel and Bearman, 2015; Kelly et al., 2016; Aebersold, 2018). Some scholars argue that simulation originates from the adult learning theory (Rutherford-Hemming, 2012) and experiential learning (Zigmont et al., 2011). In a systematic review study, Adamson (2015) reported that simulation should be based on problem-based instructional design but also reported that the application of learning theories is not evident in most simulation research work. The same findings were affirmed by Lavoie et al. (2018) in their theoretical review study.

Certain educational theories have been found prominent in some simulation studies, including Kolb's experiential learning, Bandura's Social cognitive theory, the Self-efficacy concept and the NLN/Jeffries simulation framework as an instructional design (Lavoie et al., 2018). Others have proposed a move towards social-material approaches grounded in the complexity theory (Fenwick and Dahlgren, 2015; Lefroy and Yardley, 2015; Hopwood et al.,

2016) and Benner's Novice to Expert theory (Landers, O'Mahony and McCarthy, 2020). The latter is regarded as useful in achieving authentic learning that could enable students to respond competently to healthcare complexities (Fenwick and Dahlgren, 2015). Some scholars still emphasise the following educational learning theories: behaviourism, constructivism, cognitivism, and social learning theories (Taylor, 2004; Waldner and Olson, 2007; Forrest, McKimm and Edgar, 2013; Alexander et al., 2015; Damewood, 2016; Nestel et al., 2017; Aebersold, 2018). This section discusses behaviourism, cognitivism, constructivism, Kolb's Experiential learning theory, and the NLN Jeffries Simulation Framework.

2.7.1 Behaviourism Learning Theory

The theoretical basis of behaviourism has been ingrained into nursing education (Bisholt, 2012; Tosterud, 2015; Wilson and Wittmann-Price, 2015). It is characterised by memorising, drills, and reciting to promote retention (Billings and Halstead, 2016). The behaviourism theorists include Pavlov, Watson, Thorndike, Skinner (Ana, 2020), and Mager, who believed that learning is accomplished through behaviour change, which is shaped by a positive or negative reward system (Wilson and Wittmann-Price, 2015; Billings and Halstead, 2016). In this theoretical perspective, the desired learning behaviour is driven by following structured learning expectations, instructional objectives, competencies (Billings and Halstead, 2016) and structured teaching plans and checklists (Wilson and Wittmann-Price, 2015). However, it has since received limited academic attention due to being pro-teacher-centred. Tosterud (2015) deemed this weakness advantageous, stating that it is relevant in situations of disproportionate student-teacher ratio, as seen in academic institutions.

The principles of behaviourism are stated in the literature. For example, according to Wilson and Wittmann-Price (2015), behaviourists assert that learning is (a) observable through behaviour, (b) reinforced by a response, (c) guided by instructional objectives, (d) shaped by others, (e) teacher-centred; also (f) behaviour modification leads to control, and (g) incentives may be used for classroom management. In this theoretical approach, educators are responsible for creating the learning experience/stimuli (Taylor, 2004). Nestel et al. (2017) also explained that behaviourists are more inclined to see the learner achieve external standards by demonstrating behavioural change.

A simulation learning environment or skills demonstration laboratory is a medium for facilitating the behaviourism paradigm (Billings and Halstead, 2016). The learning environment encourages educators to reinforce skills development (behaviour change) positively through ongoing feedback (Billings and Halstead, 2016). The INACSL Standards Committee (2016b) emphasises that the objectives are “guiding tools for facilitating the achievement of simulation-based outcomes and the hallmark of sound educational design” (p.S13). Nestel et al. (2017) stated that behaviourism principles are applicable in developing psychomotor skills, which require repetitive practice such as suturing and communication. Repetitive practice, commonly called deliberate practice, is highly valued and considered one of the best practices in simulation-based education (Adamson, 2015; Nestel et al., 2017).

2.7.2. Cognitivism Learning Theory

Cognitivists assume that internal mental processes drive learning and are under the student’s control (Rutherford-Hemming, 2012b). The cognitive processes that support learning under the learners' control include their willingness to learn and suspension of disbelief in simulation learning, experiences, expectations, and cognitive load (Adamson, 2015; Nestel and Bearman, 2015). Forrest et al. (2013) state that the cognitive learning theory “helps explain how knowledge or skills are perceived, encoded into the memory, stored and retrieved” (p. 46). Also, it is noted that cognitive learning theory is oriented within four perspectives: perception of information, processing of data, cognitive development, and social cognition perspective (Rutherford-Hemming, 2012b). Moreover, the widely cited cognitive learning perspective is the perception of information (Taylor, 2004; Forrest and McKimm, 2019; Nestel et al., 2019). Students in cognitive learning reflect on the learning experience by processing the information they have learned (Taylor, 2004; Rutherford-Hemming, 2012b).

During a simulation-based learning experience, debriefing is the time for harnessing cognitive development (Taylor, 2004; Forrest et al., 2013). During the debriefing process, the facilitator asks questions to enable the learner to reflect on the experience, thereby achieving the learning outcomes (Taylor, 2004; Rutherford-Hemming, 2012b). Rutherford-Hemming (2012) further outlines the educators' role, stating that they need to prepare an environment

that enables learners to process the knowledge or skills they should be developing. Such an opportunity is impossible in clinical practice settings (Wall et al., 2014).

2.7.3. Constructivism Learning Theory

Constructivist theories believe that learning occurs when meaning is attached to an experience to construct new knowledge (Rutherford-Hemming, 2012a), similar to reflecting on one's experiences to understand the world (Taylor, 2004). Constructivism is interlinked with other theoretical perspectives, personal/cognitive and social constructivism; it originated with Jean Piaget and Vygotsky, respectively (Rutherford-Hemming, 2012b; Nestel et al., 2017). Personal/cognitive constructivism depends on the individual internal mental processes, as they are required to base their learning on recalling previous knowledge and experience to respond to the present situation (Rutherford-Hemming, 2012b; Nestel et al., 2017). Meanwhile, in social constructivism, knowledge is constructed when interacting with the external environment, whereby an individual learns through interacting with the educators, other students, and the patient (Rutherford-Hemming, 2012b). Forrest and McKimm's (2019) considerations about constructivism align with the latter. They argue that it enables students to build their knowledge and physically participate in the learning experience.

Simulation is interconnected with the constructivism learning theory (Rutherford-Hemming, 2012a). Simulation learning is best facilitated through constructivism because it requires experiential learning (Forrest and McKimm, 2019), thus making it a suitable educational strategy for clinical education (Wordsworth, 2013). Students engage in active learning, construct knowledge through simulated clinical situations (Rutherford-Hemming, 2012a), and get immediate feedback to promote knowledge retention (Jeffries, 2005a). The educator's primary role is to prepare educational material and scenarios that foster the development of new knowledge and skills (Forrest and McKimm, 2019; Andersen et al., 2021).

The constructivism theory is also demonstrated through debriefing, one of the simulation's core elements (Forrest and McKimm, 2019). During debriefing sessions, a student or a group of students have the opportunity to recall and reflect on the simulation experience and

establish ways to improve their performance (Rutherford-Hemming, 2012a; Reynolds et al., 2018). Educators create the opportunity for learners to translate the simulation experience into learning through self-reflection, “motivations and prior experiences” (Forrest and McKimm, 2019, p.17).

Other sources of literature report that the constructivism theory enshrines learner-centred and active learning approaches (Billings and Halstead, 2016) and collaboration with the educator or peers (social constructivism) (Swanwick et al., 2018). The identified elements of constructivism are variables that define a student in the simulation learning environment (Jeffries, 2005a, 2021; Jeffries, Rodgers and Adamson, 2015). Furthermore, when applying this theoretical approach, educators adopt the facilitator role (Nestel et al., 2017), another essential educational delivery approach embraced in simulation-based education (Adamson, 2015; Jeffries, 2021).

2.7.4 Experiential Learning Theory

Kolb (2015) regards experiential learning as the best method compared to modalities dependent on seeing, writing, and hearing about it. Chiniara et al. (2013) support the view that simulation is immersive and enables learners to engage with the simulated learning experience in a highly interactive manner, as may be the case with real-life practice. Similarly, Waldner and Olson (2007) argued that experiential learning facilitates the integration of theory into practice, while Billings and Halstead (2016) and Bryant et al. (2020) view it as a method that prepares learners to deliver quality-safe patient care competently and confidently. However, academic staff require formal training to implement this experiential (simulation) pedagogy (Jeffries et al., 2015).

Some evidence shows that simulation-based learning processes are engraved in the cycles of experiential learning theory: concrete experience, reflective observation, abstract conceptualisation, and active experimentation (Zigmont et al., 2011; Forrest and McKimm, 2019). Several others echoed that simulation relies on experiential learning elements (Chiniara et al., 2013; Craft et al.,2014; INACSL Standards Committee, 2016c; Aebersold, 2018).

A study by Zigmont et al. (2011) explained the applications of experiential learning to simulation-based learning as follows: (a) during a simulation learning experience, learners develop concrete experiences by identifying learning gaps, and (b) reflective observation takes place during the debriefing session. The facilitator uses the observed student behaviour to guide the reflective process, enabling the learner to review their performance critically and think of ways to improve performance. (c) the student then adopts the acquired knowledge and is ready to implement it in future experiences (abstract conceptualization), (d) simulation provides readily available opportunities for active experimentation and deliberate practice.

2.9 CONCLUSION

This chapter discussed research evidence related to the study problem, highlighting key issues and priority areas for further research. The next chapter discusses the methodology of this study.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter describes the methodological approach used to address the research problem.

The nature of the research problem influences the selection of the research paradigm (Plano, Clark and Badiee, 2010; Gray et al., 2017; Brink et al., 2018; Creswell and Creswell, 2018; Polit and Beck, 2018).

This study aimed to develop a framework for integrating simulation into the Bachelor of Nursing Science programme in Eswatini. The question that guided the inquiry process was, "*What evidence and processes can inform the development of a framework to guide nurse educators in integrating simulation into the Bachelor of Nursing Science programme in Eswatini?"* Four objectives sequenced into four phases were developed to answer the research problem. They were achieved through using multiple research methods within the qualitative and quantitative approaches: scoping review (qualitative), survey research (quantitative), iterative research method (qualitative), and a Delphi survey study (QUAN→qual). An overall summary of the research process is presented in Table 3.1.

3.2 PHILOSOPHICAL STANCE AND RESEARCH PARADIGM

It is critically important to explain the philosophical principles that underpin the research design to clarify the study's orientation and thus enable an understanding and proper interpretation of its outcomes (Moon and Blackman, 2014). The philosophical refers to the beliefs about the research ontology (study of the nature of reality), epistemology (what is known about that reality), axiology (the social values) and methodology (how is the knowledge acquired) (Teddlie and Tashakkori, 2009; Biesta, 2010; Moon and Blackman, 2014; Morgan, 2014).

3.2.1 Ontology

This research's ontological orientation was pragmatism. Pragmatism focuses on answering the problem using all relevant research approaches. Pragmatists believe that there are multiple perspectives for understanding social realities; therefore, they employ methods from

quantitative and qualitative approaches (mixed methods) to solve the problem rather than relying on a single philosophical worldview (Teddlie and Tashakkori, 2009; Morgan, 2014; Creswell and Creswell, 2018). The pragmatic worldview was deemed appropriate as multiple methods from quantitative and qualitative approaches were used for data collection and analysis to address the research problem.

3.2.2 Epistemology

Pragmatist believes that epistemological issues exist within a continuum but not on two opposing ends (Teddlie and Tashakkori, 2009). The underlying view about knowledge is that it is being constructed and is based on the realities of this world; therefore, both objective and subjective views can be employed to answer the research question depending on the phases of the research project (Teddlie and Tashakkori, 2009). Both objective (phases 2 and 4) and subjective (phases 1, 3 and 4) data were collected and analysed to inform the development of the framework for integrating simulation in a Bachelor of Nursing Science programme in Eswatini.

The development of the framework was informed by phase 1 (scoping review) findings on simulation best practices and phase 2 (survey study) findings, which informed about the factors that can influence the integration of simulation in Eswatini. Lessons were drawn from these findings. The lessons learned combined findings from two viewpoints (subjective and objective views), and it served as the data source for the experts when developing the framework.

In phase 3, expert opinions were solicited using semi-structured interviews. This phase embraced the subjective perspective to generate the theoretical information and analyse the data for developing the framework. The experts iteratively reviewed the lessons learned and, guided by the NLN Jeffries Simulation theoretical model constructs, provided aspects to consider for the framework. The data was inductively interpreted under the guidance of the experts, and key messages emerged from the raw data.

In phase 4, a Delphi study approach was used to evaluate the framework's relevance and feasibility to test its utility in the Eswatini context. Data from the initial evaluation process

obtained using a checklist was analysed quantitatively to obtain the objective views of the Eswatini nurses educators about the framework. Some elements that were testing the feasibility of the activities for integrating simulation aligned to the framework did not reach an 80% consensus rating. They were re-evaluated, and open-ended questions were added to obtain the perspective/subjective views of the individual educators about the factors influencing the feasibility of those elements in the setting.

3.2.3 Axiology

The axiological perspective refers to the researcher's values, attitudes and biases that influence the research process: choice of questions (asked and not asked), types of data, methods of data collection, analysis and the interpretation of findings (Teddlie and Tashakkori, 2009; Hesse-Biber and Johnson, 2015). The researcher is a nurse educator at one of the universities in Eswatini who values clinical competency among graduate nurses, patient safety and integration of innovative educational strategies to solve the challenges of clinical education. The researcher observed inadequacies in the delivery of clinical education in the context, which she believes can be addressed through adopting and integrating simulation into the undergraduate nursing programme. However, there is no existing framework to guide the integration process. Therefore, the researcher developed a framework for integrating simulation into the Bachelor of Nursing Science in Eswatini to guide educators' and institutions' management who plan to integrate simulation.

The assumption is that simulation-based education will enable educators to provide standard clinical learning experiences that will allow students to learn, practice and develop clinical competencies before being placed to care for patients thus promoting patient safety.

3.2.5 Methodology

In a pragmatic paradigm, the researcher answers the research question using the best methods from the quantitative and qualitative approaches: mixed methods (Teddlie and Tashakkori, 2009; Creswell and Creswell, 2018). In this study, a qualitative approach was used to identify literature on best practices in simulation using the scoping review method and when developing the framework. An Iterative method was used to elicit expert opinions

on the aspect of the framework. The quantitative approach was used to assess the state of simulation use in Eswatini to identify factors that can influence the integration of simulation in the context. Lastly, the quantitative approach helped the researcher to evaluate the relevance and feasibility of the framework in the Eswatini nursing education context in achieving clinical utility.

3.3 MIXED METHODS RESEARCH APPROACH AND DESIGNS

A mixed methods design combines methods that originate from qualitative and quantitative inquiry in a single research project (Teddlie and Tashakkori, 2009; Morse, 2010; Maxwell, 2013; Hesse-Biber and Johnson, 2015; Jason and Glenwick, 2016; Creswell and Creswell, 2018; Creswell and Poth, 2018).

The strengths of using a mixed methods research approach have been discussed in the literature. They include the credibility of the findings by allowing a deeper exploration of different perspectives and an opportunity for triangulation of methods, which overrides the weakness of using a single approach, thus strengthening the evaluation of an intervention (Teddlie and Tashakkori, 2009; Maxwell, 2013; Jason and Glenwick, 2016; Creswell and Creswell, 2018). Integrating inquiry approaches is required when the research phenomena should be answered by drawing inferences from different perspectives in a single study (Teddlie and Tashakkori, 2009). The highlighted strengths formed the basis for using mixed methods in this study.

3.3.1 Types of Mixed Methods Designs

Mixed methods research approach designs are classified into monostrands and multistrands (Bryman, 2004; Teddlie and Tashakkori, 2009; Jason and Glenwick, 2016). An example of a monostrands design is a quasi-mixed design, while multistrand mixed designs include parallel, sequential, conversion, multilevel and fully integrated mixed methods designs (Teddlie and Tashakkori, 2009; Creswell and Creswell, 2018). Multistrand mixed designs were used in this study. Multistrand mixed designs integrate two research approaches (strands) (Teddlie and Tashakkori, 2009; Creswell and Creswell, 2018). A brief description of

multistrand mixed designs is presented below. Moreover, this study employed a multilevel mixed methods design.

3.3.1.1 Parallel Mixed Methods Designs

Parallel mixed method designs facilitate the implementation of qualitative and quantitative (QUAL + QUAN) approaches independently, without seeking to explore or confirm the generated findings (Teddlie and Tashakkori, 2009). However, the QUAL and QUAN strands in parallel mixed design enable the researcher to respond to the related components of the research question (Teddlie and Tashakkori, 2009).

3.3.1.2 Sequential Mixed Methods Designs

A sequential research design uses information generated from one stage of the problem to inform the next stage (Teddlie and Tashakkori, 2009; Hesse-Biber and Johnson, 2015; Jason and Glenwick, 2016; Creswell and Creswell, 2018). Teddlie and Tashakkori (2009) added that a sequential mixed design requires two strands of designs that occur chronologically: QUANTITATIVE→QUALITATIVE (QUAN→QUAL) or QUALITATIVE→QUANTITATIVE (QUAL→QUAN); the arrow indicates the sequence. The order of the sequence implies that the findings of the initial design will inform the development of the next phase of the mixed methods study (Teddlie and Tashakkori, 2009; Jason and Glenwick, 2016; Creswell and Creswell, 2018) and provides a follow-up from the initial findings (Creswell and Creswell, 2018). Sequential mixed methods designs are subdivided into explanatory or exploratory (Teddlie and Tashakkori, 2009; Creswell and Creswell, 2018).

Explanatory versus Exploratory Sequential Mixed Methods Designs

In explanatory sequential design, the researcher collects qualitative data to explain the quantitative findings (QUAN→QUAL) (Creswell and Creswell, 2018). Using explanatory sequential design is intended to explain unclear constructs and unique findings using qualitative approaches (Teddlie and Tashakkori, 2009; Creswell and Creswell, 2018). However, in exploratory sequential design, the qualitative approach precedes the quantitative design (QUAL→QUAN) (Teddlie and Tashakkori, 2009; Jason and Glenwick,

2016; Creswell and Creswell, 2018). The design process evolves over three phases: qualitative data collection, development of data collection tool variables and administration of the tool to test the aspect designed (Creswell and Creswell, 2018).

3.3.1.3 Conversion Mixed Designs

A conversion mixed design is a methodological procedure that allows converting data types from one paradigm to another QUAN data processed into QUAL "*qualitising*", or QUAL data changed to be analysed using statistical procedures *"quantitizing*" (Teddlie and Tashakkori, 2009, p.131).

3.3.1.4 Multilevel Mixed Method Design

The multilevel mixed methods design is characterised by aggregating data at various levels using a parallel or sequential approach (Bryman, 2004; Teddlie and Tashakkori, 2009). Much aligned with conducting a study within an organisation/institution, where data can be collected and analysed at the students, educators and administration/management levels using different methods (Bryman, 2004; Teddlie and Tashakkori, 2009). Findings drawn from the multiple levels of analysis are integrated to answer the study's question (meta-inferences) (Teddlie and Tashakkori, 2009). A meta-inference is the conclusions and interpretation drawn by integrating findings from the QUAL and QUAN strands in mixed methods research (Teddlie and Tashakkori, 2009). The application of a multilevel mixed method design, leading to this study's simulation framework development, is discussed below. Multiple levels of data sources were involved in addressing the study's purpose.
Figure 3.1 summarises the application process:

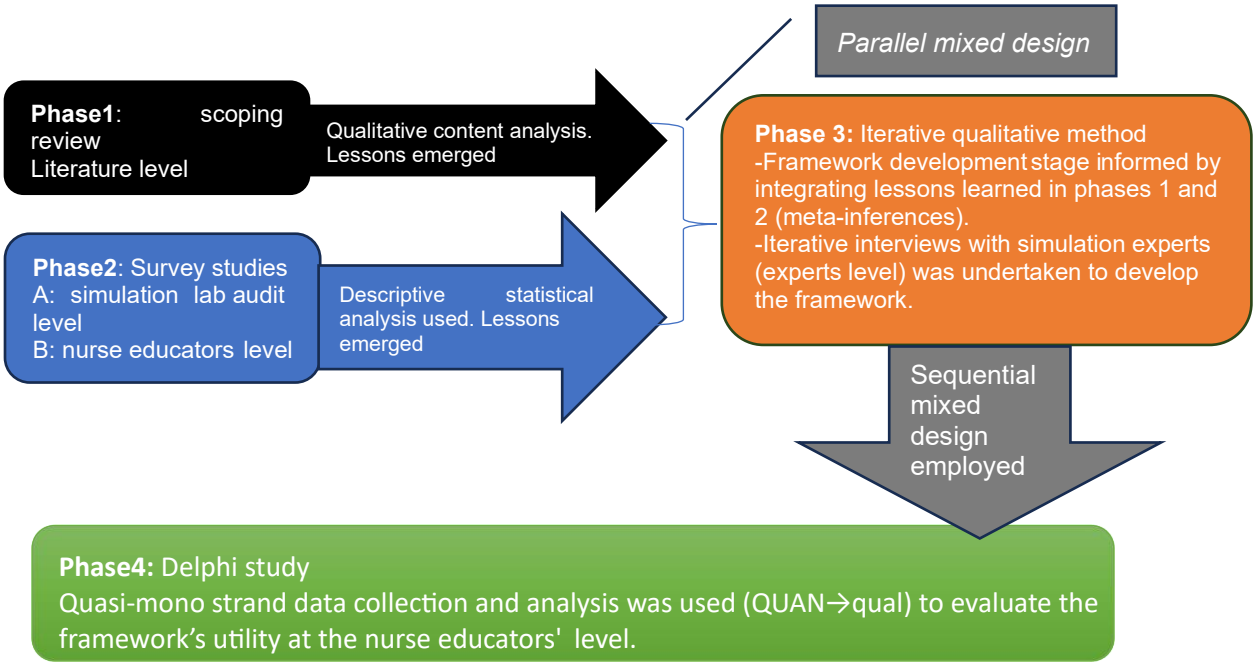


Figure 3.1 Summary of the multilevel mixed design application process

Two parallel studies (phases one and two) informed the development of a framework for integrating simulation in Eswatini. Phase one was at the literature level, where a scoping review method was used to identify best practices in simulation-based education. Phase two involved collecting data about the simulation laboratories' resources and from the nurse educators' level to establish the state of simulation use in Eswatini.

Results from these studies (phases 1 and 2) were analysed separately, but the data were triangulated to draw lessons. These meta-inferences (lessons learned) were the data source for developing Eswatini's framework. The lessons learned from the scoping review served as benchmark information for ideal simulation processes, structure and outcomes. The survey studies revealed the strengths, weaknesses, threats, and opportunities regarding SBE in the Eswatini nursing education context, and it informed what can work in the study setting.

Phase three entailed developing the framework for integrating simulation in Eswatini using meta-inferences drawn in phases 1 and 2. The aim was achieved through the involvement of simulation experts who iteratively reviewed the data (meta-phased findings) to identify elements to consider for the Eswatini framework. The organisational elements that shape

simulation in nursing (OESSN) and the NLN Jeffries Simulation Theory concepts guided the synthesis of evidence. Findings generated from the iterative exploratory data review process were thematically analysed, using pre-determined themes formed when drawing the lessons from phases 1 and 2. These themes became the domains of the proposed framework. The framework was evaluated to test its utility in the Eswatini context, achieved through the exploratory sequential mixed design. The steps are shown in the figure below:

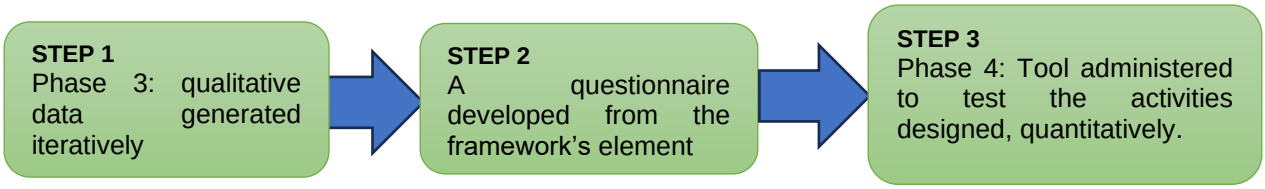


Figure 3.2 Steps in the explanatory sequential mixed method designs

In phase four, Eswatini nurse educators evaluated the proposed framework for clinical utility in the context using a Delphi methodological approach.

Table 3.1: Summary of the Research Process

PHASE	OBJECTIVE	RESEARCH METHODS	POPULATION AND SAMPLE	DATA COLLECTION INSTRUMENT	DATA ANALYSIS
One	To explore existing literature on best practices of simulation-based education in the educational preparation of undergraduate nursing students locally (Sub-Saharan Africa) and internationally.	**Scoping review**: a scoping review based on Joanna Briggs Institute (JBI) methodology guidelines guided the research process.	**Location of evidence:** Various databases: Science Direct, CINAHL, SAGE Journals, Wiley Online Library, ERIC. **Search string:** (prelicensure nursing students OR healthcare students OR nurse educators) AND (simulation best practices OR simulation frameworks OR simulation standards) AND (Sub-Saharan Africa OR Africa OR Europe). **Inclusion criteria:** peer-reviewed and grey literature on simulation in nursing. All literature was published between 2010 and the present.	– A data extraction instrument was used, and the following information was charted: author, title, year of publication, purpose, methodology, and findings reported. – The JBI scoping review manual for methodology (Peters, Godfrey, Mclnerney, *et al.*, 2015) informed aspects considered in the data extraction tool (Annexure 14).	Codes, categories and subcategories were deduced using Hsieh and Shannon's (2005) qualitative content data analysis method.
Two	To assess the current state of simulation use in the educational preparation of the Bachelor of Nursing Science Students in Eswatini.	**Survey:** two survey studies were conducted to answer the research objective. **Survey (A):** assessed the simulation laboratory resources and infrastructure. **Survey (B)** educators' perspectives regarding the state of simulation use during the	**Survey A** **Sampling:** A census (total count) sampling technique was used to select the simulation laboratories (N=4) in the three (3) NEIs. **Sampling frame:** A list of nursing and midwifery simulation laboratories was obtained from each institution. **Survey B:** – **Sampling:** A census sampling technique (total count) was used because the population was relatively small.	**Sampling procedure:** total sample. **Data collection instrument:** Checklist questionnaire (Audit tool for simulation centre developed by (Riabtseva, Reynolds and Gisin, 2015). **Data collection instrument:** – "The simulation culture organisational readiness survey (SCORS)" tool developed by Foisy-Doll and	– Descriptive statistics (frequencies and percentages) were used to establish the extent of simulation use in the three Universities. – The data were computed using a

		educational preparation of the Bachelor of Science students in Eswatini	– The sample size was (n=46) lecturers/nurse educators from the three (3) Universities/NEIs. **Sampling frame**: – A list of educators was requested from the management of the three NEIs.	Leighton (2017) was used to collect the data. – The tool consists of a 5-point Likert scale. – The questionnaire was self-administered and hand-delivered to each nursing education institution (NEI).	Statistical Package for Social Science (SPSS) V20.
3	To develop a framework for integrating simulation into the Bachelor of Nursing Science programme in Eswatini.	The NLN Jeffries Simulation Theory guided the experts' views in developing the framework.	**Population:** Nurse educators with expertise in simulation who were based in South Africa and the United Kingdom (N=2). – Purposive sampling was used to obtain the study sample.	– An iterative process involving expert views was used to identify priority components suitable for developing a framework to integrate simulation into the Bachelor of Nursing Science programme in Eswatini.	– Thematic Content Analysis by Hsieh and Shannon (2005).
4	To evaluate the framework for clinical utility in preparing Bachelor of Nursing Science Students in Eswatini.	Experts were engaged in evaluating the utility of the proposed framework using a Delphi study technique.	Experts were purposively selected. The sample selection was based on their clinical teaching and practice involvement. Included were (N=16) nurse educators. Sampling framework: midwifery and general nursing departments.	– The Delphi questionnaire was developed from phase three (3) information. – A three-scale tool was designed and administered to determine the relevance and feasibility of the activities of the proposed framework. – The questionnaire was hand delivered, and some were sent via email, depending on the participant's preference.	– Descriptive statistics and content analysis procedures were used to analyse the data. – The activity was deemed relevant and feasible when an 80% mean consensus score was reached.

3.4 PHASE ONE: SCOPING REVIEW

3.4.1 Introduction

The first phase of this study used a scoping review approach. The reasons for conducting a scoping review, according to Arksey and O'Malley (2005), include (a) "examining the extent, range and nature of research activity, (b) determining the value of undertaking a full systematic review-mapping of the literature, (c) summarising and disseminating research findings to policymakers, practitioners and consumers, and (d) identifying the research gaps in the literature, that is, the overall state of research activity" (p. 21). The rationales for conducting scoping reviews have been cited in multiple studies (Peters, Godfrey, Khalil, et al., 2015; Peters, Godfrey, Mclnerney, et al., 2015; Pham et al., 2015; Khalil et al., 2020; Peters et al., 2021).

This study's objective was to explore existing literature on best practices of simulation-based education in the educational preparation of undergraduate nursing students locally (Sub-Saharan Africa) and internationally. Below is a description of the scoping review methodological approach.

3.1.1.1 Description of the Scoping Review Methodological Approach

A scoping review is used within the healthcare fraternity by graduate students, researchers, clinicians, and policymakers (Khalil et al., 2021; Pollock et al., 2021) to inform decision-making and generate evidence on a particular issue (Peters, Godfrey, Khalil, et al., 2015; Peters et al., 2021). Scoping reviews are designed to answer questions that other systematic reviews could not solve (Khalil et al., 2019). Furthermore, it uses multiple data sources (Peters et al., 2021). It answers broader questions that seek to describe and identify study elements rather than analyse the quality of evidence to examine the effectiveness of the specified intervention (Peters et al., 2022). It follows a structured process that includes widely pre-determined reasons and a prescribed methodological framework (Arksey and O'Malley, 2005; Peters, Godfrey, Mclnerney et al., 2015; Pham et al., 2015; Munn et al., 2018; Tricco et al., 2018; Peters et al., 2021; Pollock et al., 2021).

The literature has reported three frameworks used by researchers to guide conducting scoping reviews: Arksey and O'Malley's (2005) seminal work, Levac, Colquhoun and O'Brien's (2010) recommended approach and the Joanna Briggs Institute methodological approach (Peters, Godfrey, Mclnerney, et al., 2015; Peters et al., 2021, 2022). This study was guided by the Joanna Briggs Institute (JBI) scoping review methodological approach.

A scoping review is a relatively new research approach, and its framework is still undergoing refinement (Peters, Godfrey, Khalil, et al., 2015; Pham et al., 2015; Peters et al., 2017, 2021). As noted above, the systematic process for conducting scientific scoping reviews dates back to 2005 from work that originated with Arksey and O'Malley and later was updated by Levac, Colquhoun and O'Brien in 2010 (Peters, Godfrey, Mclnerney, et al., 2015).

Arksey and O'Malley's (2005) scoping review methodological framework consists of five (5) steps: (a) identifying the research questions, (b) identifying relevant studies, (c) study selection, (d) charting the data and (e) collating, summarising and reporting findings (Hilary Arksey and O'Malley, 2005). Levac et al. (2010) made some recommendations to clarify the concepts of Arksey and O'Malley's (2005) framework. Their renowned work served as a benchmark for the Joanna Briggs Institute in developing a scoping review of research methodological guidelines (Peters, Godfrey, Mclnerney et al., 2015). The JBI scoping review protocol was developed using the following elements: (a) authors' information, (b) review's title, objectives and questions, (c) review's background, (d) inclusion criteria, (e) search strategy, (f) extraction of results and (g) presentation of results (Peters, Godfrey, Khalil, et al., 2015; Peters, Godfrey, Mclnerney, et al., 2015).

The development of the JBI scoping review methodological approach has been an ongoing process, with recurrent updates informed by users, the literature and members of the JBI collaborative group (Peters et al., 2020, 2021, 2022). The updated JBI methodological process for conducting a scoping review includes (a) scoping review title and question(s), (b) inclusion criteria, (c) search strategy, (d) evidence screening and selection, (e) data extraction, (f) data analysis and (g) presentation of findings (Peters et al., 2020, 2021). Below is the discussion of this study's scoping review process.

3.3.2 Scoping Review Process

The updated JBI methodological approach identified above informed the design of this study's scoping review process. The section briefly describes the JBI scoping review process and its application in this study.

3.4.2.1 Title and Review Questions

The initial step in Arksey and O'Malley's (2005) scoping review framework is the review question. However, the JBI methodological approach directs that it should be informed by a scoping review title (Peters et al., 2020, 2021, 2022). Attention is required when developing the title as it informs the readers about the phenomena of the scoping review study and reflects the PCC criteria (Peters et al., 2020, 2021, 2022). The mnemonic PCC stands for population, concepts and context (Peters, Godfrey, Khalil, et al., 2015; Peters, Godfrey, McInerney et al., 2015; Peters et al., 2021). The PCC is a precision criterion for structuring scoping review problems such as the PICO (population, intervention, comparator and outcomes) format used in systematic reviews (Peters, Godfrey, McInerney, et al., 2015).
This scoping review was entitled "Best Practices in Simulation-Based Education in the Educational Preparation of Undergraduate Nursing Students Locally (Sub-Saharan Africa) and Internationally: Scoping Review".

The formulation of the review question should denote the study's PCC criteria (Peters et al., 2020; 2021; 2022). Similarly, Arksey and O'Malley (2005) recommended that the question should define the parameters of the scoping study; however, they were not specified. Hence, the Levac et al. (2010) recommendations enhance the latter's framework; they stated that the question should clearly indicate the concept, population and outcomes. Moreover, all concur that the scoping review question should be broad to ensure comprehensive coverage of the problem (Arksey and O'Malley, 2005; Levac et al., 2010; Peters et al., 2020, 2021, 2022). This scoping review study question was, "What are the best practices in simulation-based education that guide the educational preparation of undergraduate nursing students locally (Sub-Saharan Africa and internationally)?"

3.4.2.2 Inclusion Criteria

Similar to other systematic reviews, scoping review studies are conducted based on predetermined inclusion criteria, guiding information relevant to the problem/question under study (Arksey and O'Malley, 2005; Peters, Godfrey, Khalil et al., 2015; Peters et al., 2020, 2021, 2022). The inclusion criteria specify the study's population, concept and context (Peters, Godfrey, Khalil, et al., 2015; Peters, Godfrey, Mclnerney, et al., 2015; Tricco et al., 2018; Peters et al., 2020, 2021, 2022). The scoping review criteria indicate the essential characteristic features of the review objective or question (Tricco et al., 2018; Peters et al., 2021). Further, scoping reviews do not seek to prescribe the type of evidence source but rather consider all sources of evidence that address the study's variables of interest (Peters, Godfrey, Khalil et al., 2015; Peters, Godfrey, Mclnerney et al., 2015; Peters et al., 2020, 2021, 2022). The inclusion criteria for this scoping review are presented below:

Population or study participants: The population element specifies those who participated in the study, including their biological characteristics, as defined in the study objective/question (Peters, Godfrey, Khalil et al., 2015; Peters, Godfrey, Mclnerney et al., 2015; Peters et al., 2020, 2021). The population of this review was broad because of the nature of the study. Simulation-based nursing education involves various personnel who participate in the educational preparation of undergraduate nursing students. Therefore, the following were the inclusion criteria for this scoping review study:

— Undergraduate/prelicensure nursing students engaged in simulation learning.
— Nurse educators/lecturers/faculty, clinical instructors, clinicians/nurses engaged in simulation.

Concept: The concept(s) are those elements being investigated, such as interventions, outcomes and the phenomena of interest, the same as those in other systematic reviews (Peters, Godfrey, Khalil et al., 2015; Peters, Godfrey, Mclnerney et al., 2015; Peters et al., 2021). They should be clearly stated to guide the depth and magnitude of the investigation (Peters, Godfrey, Mclnerney et al., 2015). The principal concept for this study was the "best practices in simulation-based nursing education".

Context: The context explains variables such as the geographical area and specified sociocultural factors where the articles will be sourced (Peters, Godfrey, Khalil et al., 2015; Peters, Godfrey, Mclnerney et al., 2015; Peters et al., 2020, 2021, 2022). The articles were sourced from:

— The African region, in sub-Saharan Africa, and internationally (outside the African region).
— Nursing and medical education institutions include colleges, universities, clinical settings/hospitals, and simulation centres.

Other inclusion criteria:

— Language- restricted to English only. The language was restricted to English only because the researcher could only read English and Siswati and had no financial resources to access and fund fluent translators for languages. However, no relevant literature was published in Siswati.
— All literature that was published from 2010 to the present.

3.4.2.3 Search Strategy

The search strategy should comprehensively capture published evidence and grey literature (Peters, Godfrey, Khalil, et al., 2015; Peters, Godfrey, Mclnerney, et al., 2015; Peters et al., 2017, 2020, 2021). This scoping review considered sources of evidence published from 2010 to the present. They included peer-reviewed studies: qualitative and quantitative studies, mixed methods studies, systematic (scoping, meta-analysis and integrative) reviews, randomised control trial studies and grey literature: policy documents, guidelines, standards, editor's letters, opinion/discussion papers, literature review, thesis, and curriculum.

A comprehensive JBI search strategy should comprise three aspects: the accessed databases, specifying the key search words/index terms and using a reference list of identified sources (Peters, Godfrey, Khalil, et al., 2015; Peters Godfrey, Mclnerney et al., 2015; Peters et al., 2020). A similar approach was considered by Arksey and O'Malley (2005).

The data were extracted from the following databases: Science Direct, CINAHL, SAGE Journals, Wiley Online Library and ERIC. They were chosen because they publish literature relevant to the phenomena of interest.

A set of search string words that led to the selection of contextual relevant literature was formulated with the help of a librarian and approved by the research supervisor, an expert in simulation and nursing education. The search string included (prelicensure nursing students OR healthcare students OR nurse educators) AND (simulation best practices OR simulation frameworks OR simulation standards OR clinical simulation) AND (sub-Saharan Africa OR Africa OR Europe/Oceania/America/ Asia). Table 4.1, in the Chapter 4 results section, depicts the total number of articles generated per the search string word combination against the database from which they were sourced.

3.4.2.4 Evidence Screening and Selection

The screening and selection process follows a systematic approach based on the inclusion criteria (Pham et al., 2015; Tricco et al., 2018; Peters et al., 2020, 2021; Pollock et al., 2021). The process is non-linear but iterative (Levac et al., 2010). The screening process starts with the review of the article's title, abstract and then the full text if the latter reveals much of the needed information (Levac et al., 2010; Pham et al., 2015; Tricco et al., 2018; Peters et al., 2020, 2021; Pollock et al., 2021). In addition, it is necessary to pilot the screening and selection criteria approach to determine consistency (Peters et al., 2020, 2021). A minimum of three reviewers are required to cross-check and resolve disagreements regarding the relevancy of selected studies (Tricco et al., 2018; Peters et al., 2020, 2021; Pollock et al., 2021) to avoid sampling (selection) bias, which gives rise to misleading findings (Polit and Beck, 2018).

Three reviewers participated in this study's evidence screening and selection process. However, the researcher independently conducted the initial search, screening and selection of the literature guided by the inclusion criteria. The screening and selection process began with the title. The abstract was reviewed for contextual relevance after ascertaining the title's relevance to the topic. The article was selected if it contained the inclusion criteria and

context relevant to the review question. Most articles were identified through the title and abstract format. However, after reading the complete text, some were considered irrelevant.

The identified articles from the researcher's independent search and selection process were saved in Mendeley's reference manager software. Further evidence screening and selection began, and the same articles were shared with the second reviewer to identify eligible articles independently. We reported back to each other to discuss our selection results. Eligible and irrelevant articles were reported. Where there were disagreements between reviewers, the third reviewer, the research supervisor, was engaged. The entire research evidence was colour-coded and sent to the supervisor, highlighting articles where consensus was reached and where it was not reached. The research supervisor (third reviewer) scrutinised the evidence, and all the disagreements were resolved amicably through the research supervisor's guidance (Annexure 21). The final selection process outcome contained the eligible and rejected articles; see Figure 4.1, a PRISMA flow chart diagram, in the Chapter 4 results section. The basis for rejecting some articles was that the content did not articulate the simulation best practices within this study’s scope.

3.4.2.5 Data Extraction

Data extraction is when the researcher(s) or reviewer(s) obtain the information from the articles to be charted per the objectives or questions of the scoping review question. The contents or data fields to be extracted include (a) author(s), (b) year of publication, (c) source country, (d) aim/purpose, (e) population, (f) sample size, (g) methodology, (h) type of intervention and comparator, (i) duration of intervention, (j) concept, (k) measurement of outcomes, (l) key findings, and (m) gaps in the literature (Peters, Godfrey, Khalil, et al., 2015; Peters, Godfrey, Mclnerney, et al., 2015; Peters et al., 2020). Each identified element is part of the data extraction instrument; however, the inclusion of each field depends on its relevance in the study (Peters, Godfrey, Khalil, et al., 2015). Also emphasised is that data charting is an iterative process as content can be modified accordingly throughout the study (Levac et al., 2010; Peters et al., 2017).

In this scoping review, the following fields were charted: (i) author(s); (ii) year of publication; (iii) source country; (iv) aim/purpose (v); sample size; (vi) methodology; (vii) concept and (viii) summary of key findings. The data extraction matrix is presented in Annexure 22.

3.4.2.6 Data Analysis

The data analysis method should be pre-determined and justified in the methodology section to understand its relevance in the study (Peters et al., 2020, 2021). In Arksey and O'Malley's (2005) study, data were thematically organised, while Levac, Colquhoun and O'Brien (2010) deemed using a qualitative content analysis approach appropriate. In comparison, Peters et al. (2021, 2020) and Pollock et al. (2021) supported using descriptive qualitative methods, such as coding, to categorise data extracts. Moreover, implementing this analysis technique depends on whether the aim is to establish, define or search for characteristics of a particular concept (Peters et al., 2021). Additionally, it is relevant to apply basic statistics to report a count of elements such as concepts, geographical location and population (Peters et al., 2020, 2021). In this scoping review, article characteristics were reported: context, population, and sources of evidence. The major findings were analysed using a qualitative content analysis method.

Qualitative Content Analysis

Content analysis helps interpret textual data and is inherent in the qualitative approach. It has been used mainly by health science researchers (Hsieh and Shannon, 2005). They further stated that it allows the coding and presentation of the findings into meaningful categories. The highlighted description of this approach formed the basis of this study. This scoping review yielded vast amounts of textual data. The researcher derived contextual codes and categories that addressed the study objective through this data analysis approach.

The content analysis method has three distinctive techniques: conventional, directed and summative. They all derive codes from the data set but are processed differently (Hsieh and Shannon, 2005). The conventional analytic approach extracts codes directly from textual data. The directed method uses pre-existing theoretical frameworks to guide the coding

process. The summative approach derives codes from dominating keywords (Hsieh and Shannon, 2005). The conventional content analysis approach guided this study.

Conventional content analysis approach:

Conventional content analysis is ideal for studies describing phenomena of interest and developing a theory (Hsieh and Shannon, 2005). This approach's focus aligns with this study's objective; it facilitated the categorisation of evidence on simulation best practices in nursing education from the extracted articles.

Conventional content analysis methodological steps:

a) The data analysis process begins with repetitive reading until one develops a complete sense of the text (Hsieh and Shannon, 2005). Iterative reading enabled the researcher to immerse herself in the data.
b) The next step is to formulate labels for codes (coding scheme). The initial coding can be achieved by tracking all similar words and noting phrases that capture critical thoughts about the concept at a glance. Various markings using highlighters or attaching notes on the relevant ideas can be employed (Hsieh and Shannon, 2005). Furthermore, all the classified texts are read to infer their meaning. Continuous revision and reflection on the data are necessary, and this process leads to the formulation of labels for codes that merge all the established views (Hsieh and Shannon, 2005). In this study, all data with similar ideas were coloured with the same highlighter for easy tracking. The data segments were then consciously read, which led to the intuitive discovery of their meaning. The initial codes were developed from the data segments through repetitive reading.
c) Formulation of categories: the coded data are regrouped depending on their relationship with each other to form categories. The categorised codes are then collated into meaningful clusters (Hsieh and Shannon, 2005). If there are still similarities between the data classes, these sub-categories are merged into broader categories (Hsieh and Shannon, 2005). The regrouping of sub-categories was carried out until there were no similarities between categories. As a result, categories, sub-categories and codes representing the identified best practices of

simulationbased education emerged. The categories, sub-categories and codes derived from the data are presented in Annexure 23.

d) Definition of the category, sub-category and code: the identified categories, subcategories and codes should be defined to reflect their meaning as presented in the raw data in preparation for reporting findings (Hsieh and Shannon, 2005).

3.4.2.7 Presentation of Results

There are two sections to consider when reporting the scoping review results. They include a visual presentation of the selected studies via a PRISMA flow chart diagram and a description of the findings from the extracted data (Peters et al., 2020, 2021). The content of the critical results should include a descriptive report of the PCC characteristics and conclusions that align with the scoping view objectives and questions (Tricco et al., 2018; Peters et al., 2020; 2021; Pollock et al., 2021). Various data presentations apply to scoping reviews, including charts, tables and narrative descriptions (Pollock et al., 2021). A PRISMA flow chart diagram was created, and findings are presented in Figure 4.1, while the summary of the extracted data matrix is charted in Annexure 22. The article's characteristics (population, context and sources of evidence) and codes and categories that emerged from findings are presented in Chapter 4 (Table 4.5) results section.

3.5 PHASE 2: SURVEY RESEARCH

3.5.1 Introduction

This phase focused on establishing the state of simulation use in the educational preparation of the Bachelor of Nursing Science students in Eswatini. The simulation laboratories' human and material resources and the lecturers'/educators' perspectives were assessed to address the study objective. A quantitative approach using a survey descriptive cross-sectional design guided the research process.

3.5.2 Quantitative Research Approach

A quantitative research approach is an inquiry that generates numeric data; it is used if the intention is to measure or quantify the amount of something (Gray et al., 2017). This approach enabled the researcher to quantify the participants' responses regarding the extent to which simulation-based education was used in preparing the Bachelor of Nursing Science students in Eswatini.

3.5.2.1 Survey Research

Survey research is a systematic method used in quantitative research (Creswell and Creswell, 2018) for conducting primary studies (Rea and Parker, 2014). Survey research is utilised when collecting data to describe trends, participants' attitudes and opinions (Gray et al., 2017; Creswell and Creswell, 2018). Additionally, the self-report method and structured instruments are used in data collection (Rea and Parker, 2014; Creswell and Creswell, 2018), and the data are analysed descriptively (Gray et al., 2017).

3.5.2.2 Descriptive Cross-sectional Design

The descriptive cross-sectional design is utilised when collecting data only at one point in time from different participants during the research project (Gray et al., 2017; Brink et al., 2018; Creswell and Creswell, 2018). The described design approach was implemented when conducting the survey studies. All the participants were engaged once to participate in the survey.

3.5.3 Research Setting

The proposed study was conducted in Eswatini. Eswatini has an estimated population of 1.2 million people located in four geographical regions (The World Bank Group, 2019). The country is served by four (4) nursing education institutions. Three of those are universities and a single nursing college. This research was conducted in the three universities as they prepare the Bachelor of Nursing Science students. The three universities are the University of Eswatini (UNESWA), Southern Africa Nazarene University (SANU) and Eswatini Medical Christian University (EMCU). These universities are situated in two geographical regions:

Manzini and the Hhohho region. The University of Eswatini and the Eswatini Medical Christian University are in the Hhohho region, while the Southern Africa Nazarene University is in the Manzini region. The two institutions in the Hhohho region are approximately 40 kilometres from the institution in the Manzini region. They are all situated in an urban area, less than 7 kilometres from the city centres, and have access to good transport and communication infrastructure.

The three universities (UNESWA, SANU and EMCU) train nurses who will be registered by the Eswatini Nursing Council (ENC) for the first time. The graduates from these institutions undergo four-year training to obtain a basic/bachelor's degree in nursing. Their preparation includes theory and practice (achieved through simulation learning in demonstration laboratories and real-life clinical learning).

The three universities have different organisational structures. At UNESWA, the Faculty of Health Science is headed by a dean, an assistant registrar, and department heads. There are three departments: General Nursing Science, Midwifery Science and Community Health Nursing. However, the Faculty also houses the Department of Environmental Health Science. The UNESWA Faculty of Health Sciences has two simulation laboratories, one designated for General Nursing Science and the other for Midwifery Science. Also, the essential thing about the UNESWA Faculty of Health Science is that it is the only tertiary institution offering postgraduate studies at the Master level: Family Nurse Practitioner and Midwifery studies. Doctorate studies are under development. The SANU Faculty of Health Science has four departments: Nursing, Midwifery, Anaesthesia and Medical Laboratories. The Faculty has trained nurses and midwives since 1927 (Southern Africa Nazarene University, 2021). All the programmes use one simulation laboratory. The last tertiary institution is the EMCU. Their Faculty of Health Science offers four bachelor's degrees: Nursing, Pharmacy, Radiography and Medical Laboratories (Eswatini Medical Christian University, 2019). The Faculty has one simulation laboratory for all the programmes.

3.5.4 Population

Population refers to a particular group of persons, units, or elements that meet the criteria that will enable the researcher to study the research problem (Gray et al., 2017; Polit and

Beck, 2017; Brink et al., 2018). The target population were all nurse educators (N=49) who were involved in the educational preparation of Bachelor of Nursing Science students and all simulation centres or demonstration laboratories (N=4) in the three universities (UNESWA, SANU and EMCU). Table 3.2 below shows the population of nurse educators per institution during this study.

Table 3.2: Total number of educators in Eswatini

Name of University/ NEI	Number of lecturers or nurse Educators
UNESWA	28
SANU	12
EMCU	9
Total	49

3.5.4.1 Inclusion and exclusion criteria

The literature emphasises that it is essential to state the population inclusion and exclusion criteria (Brink et al., 2018). The unique elements for inclusion and exclusion into the study were based on the study's objective.

Included in the study were the following:

- All educators involved in the educational preparation of Bachelor of Nursing Science students in Eswatini (nursing and midwifery).
- All nurse educators, regardless of the duration of service.
- Nursing departments within the university's Faculty of Health Sciences.
- All simulation centres/ laboratories within the Faculty of Health Sciences.
- Simulation laboratory officers (technologists, clinical instructors)
- Reads and writes using the official languages (English or Siswati).

Excluded from the study were the following**:**

- Non-nursing/midwifery lecturers or academic staff members teaching nursing students basic science courses (chemistry, anatomy) and other non-nursing academic courses.
- Lecturers/ educators away on study leave.
- All part-time or visiting nurse educators/lecturers.
- Nursing education colleges.
- Teaching assistants (TAs)

3.5.5 Sampling

Sampling involves selecting a sample from the population that meets the inclusion criteria to help answer the research questions (Teddlie and Tashakkori, 2009; Gray et al., 2017). The population of this study was sampled from all three universities or NEIs involved in the educational preparation of Bachelor of Nursing Science students. Sampling entails describing the sampling frame, sampling procedure (probability or nonprobability) and determining the sample size (Gray et al., 2017).

3.5.5.1 Sampling frame

Applying a sampling frame is desirable in survey research (Rea and Parker, 2014). The sampling frame is a list of the potential population that meets the predefined criteria of the study (Gray et al., 2017; Brink et al., 2018; Creswell and Creswell, 2018; Polit and Beck, 2018). A list of the lecturers/educators was requested and obtained from the faculty dean's office. All institutions, UNESWA, SANU and EMCU, shared a list of nursing and midwifery academic staff.

3.5.5.2 Sampling Technique

Probability sampling techniques are used in quantitative survey studies, and the techniques include simple random sampling, stratified sampling, systematic interval sampling and cluster sampling (Gray et al., 2017; Brink et al., 2018; Polit and Beck, 2018). However, a census (total count) sampling method is used if the population is less than 200 (Israel, 1992). Mukhtar and Ahmed (2019), whose study objective was to evaluate the effect of a nursing programme, used a similar sampling technique to eliminate bias and meet the desirable

precision. The census (total) sampling approach was used in this research. Other sampling techniques were deemed inappropriate in producing a representative sample because the population were small for both survey studies, survey A (N=4) and survey B (N=49), during the research period.

3.5.5.3 Sample size

The sample size describes the number of participants included in the study (Brink et al., 2018). Determining an appropriate sample size requires adherence to criteria, which includes considering the study's purpose and population size, level of precision, confidence level and degree of variability (Israel, 1992; Gray et al., 2017; Brink et al., 2018; Polit and Beck, 2018; Verma and Verma, 2020). Various methods are used to determine the appropriate sample to eliminate bias, including "a census for small populations, imitating a sample size of similar studies, using published tables, and applying formulas to calculate a sample size" (Israel, 1992, p.2).

A census for a small population method was considered in this study to achieve a 95% confidence level at a .05 precision level. Additionally, a published table for determining an appropriate sample size for a specified population was used to determine the optimal returned sample size to achieve the highlighted goal (95% confidence level at a .05 precision level).

Adam (2020) determined a returned sample of various population sizes, using 90%, 95%, and 99% confidence levels at the error margin of 5% for categorical and 3% for continuous variables. Adam (2020) began with a population size of (N=10) elements/subjects, unlike other researchers who only computed a returned sample size from a population of (N=100) (Israel, 1992; Bartlett et al., 2001). Hence, the work of Adam (2020) was used in this study.

Adam's (2020) research was built from Taro Yamane's 1967 work and acknowledged adjusting the latter's formula to assist social science researchers in determining an appropriate returned survey sample size (Adam, 2020). This current study measured categorical variables. In survey A, the returned sample size remained unchanged to the

population size (n=4), while in survey B, the returned sample size was (n=46) out of a total population of (N=49).

An approximation was used to plot this study's optimum returned sample size for the population of Eswatini nurse educators (N=49), given that the closest listed population sizes in Adam's (2020) table are (N=45 and N=50). As such, a population size of 50 was used as a benchmark for this study. In Adam's (2020) table, a population of 50 will require a returned sample size of n=43 at a 90% confidence level (t=1.645), n=45 sample size at a 95% confidence level (t=1.96), and n=47 sample size at a 99% confidence level (t=2.58), all at an error margin of 0.05 and □=2. This study achieved a returned sample size of n=46, and when compared with Adam's (2020), it approximately falls within the 95% confidence level. Table 3.3 below displays the returned sample size for each institution:

Table 3.3 Returned Survey Sample Size per Institution

Name of University/ NEI	Population	Returned sample
NEI-A	28	26
NEI-B	9	9
NEI:C	12	11
Total	49	46

3.5.6 Data Collection

Data collection entails describing the process of gathering data from participants to answer the study question (Gray et al., 2017; Brink et al., 2018). Various ways are used to gather data in survey research; they include direct interviews, telephonic interviews, and self-administered questionnaires done electronically or using pen and paper (Rea and Parker, 2014; Gray et al., 2017; Brink et al., 2018; Polit and Beck, 2018). Data in survey research are collected using a structured instrument and must be described (Creswell and Creswell, 2018). In both survey studies, structured instruments were used to collect the data.

3.5.6.1 Survey A Data Collection Tool

In survey A, data collection focused on gathering data through auditing the simulation laboratories/centres' resources. The data was collected using a tool developed by Riabtseva et al. (2015), who published a handbook for guiding the establishment of simulation centres. The tool was adopted because it contains elements that align with the survey objective. The elements of the tool are (a) instructor/staff, (b) financial and resource planning, and (c) infrastructure and equipment (Riabtseva et al., 2015). The data collection tool is attached in Annexure 15.

The three elements of the questionnaire were measured against criteria, and a four-point option scale was used to elicit responses. Element A: The instructor/staff needs consists of two sub-elements with 20 itemised criteria. The first sub-element enquired about human resource availability for simulation with 4 criteria and measured with the options: yes, no, partially or not applicable. Moreover, the other sub-element of the A component has 16 itemised criteria. It assessed whether there are staff members trained in the core aspects of simulation pedagogies using the following options: all, most, some or none.

Element B (financial and resource planning) investigated the availability/planned financial and resources for supporting the sustainability of simulation-based education. This element is subdivided into two as well. Part one investigated the availability of funding and resource plans for supporting one-time cost resources, such as the infrastructure and equipment. This aspect was measured with 6 criteria items using the following scale options: yes, partially, no or N/A. The second component assessed the availability of financial and resource plans for supporting recurrent resources, which included faculty development needs, equipment maintenance and consumables. Nine items were listed and measured using the same scale options.

Element C: infrastructure and equipment, assessed the availability/planned infrastructure and equipment needed to support the goal and ensure the sustainability of simulation-based education. This element is composed of five sub-elements. The first sub-element has nine criteria items about the infrastructure design and was measured using the following options:

yes, no or N/A. The second sub-element has six criteria items that assessed the availability of general structures in the simulation laboratory, and the same as the above response options were used. The third sub-element had four criteria items for measuring the availability of simulation equipment, and response options were yes, partially, no or N/A. The fourth sub-element has twenty-four criteria for assessing clinical equipment availability for simulation learning, and the response options were yes, some, no, or N/A. The fifth sub-element has three criteria items about the availability of technical equipment in the simulation laboratory, and response options included yes, no or some.

3.5.6.2 Survey B Data Collection Tool

Data was collected from the study participants using a 5-point Likert Scale tool named the Simulation Culture Organisational Readiness Survey (SCORS) to assess the state of simulation use in the Eswatini NEIs. In 2017, simulation experts Foisy-Doll and Leighton published the SCORS tool to help those institutions using/intending to integrate simulation to assess their state readiness (Foisy-Doll and Leighton, 2017a). They highlighted that evidence shows that “successful implementation and integration of simulation in nursing education is linked to organizational culture readiness for change” (Foisy-Doll and Leighton, 2017a, p.3). Hence, the tool was deemed appropriate to address this study objective. The tool developers granted permission to use the tool (see Annexure 16).

The Foisy-Doll and Leighton (2017a) SCORS tool is subdivided into four themes or sections: A. Defined Need and Support for Change, B. Readiness for Culture Changes, C. Time, Personnel, and Resource Readiness and D. Sustainability Practices to Embed Culture. The thematic area, defined need and support for change is assessed using 9 items. The readiness for culture change is examined using 11 criteria items. The time, personnel and resource readiness consist of 12 items and the theme of sustainability to embed culture has 4 items. The 5-point Likert scale consists of the following options: None at all=1, A little=2, Somewhat=3, Moderately=4 and Very much=5 (Foisy-Doll and Leighton, 2017a). The SCORS tool is attached in (Annexure 17).

3.5.6.3 Data Collection Procedure

The data collection began after the study was ethically approved and study sites had been granted permission. A poster for recruiting participants was posted in all the institutions indicating the purpose of the study, inclusion criteria and start date, which was scheduled from 08 August 2022 to 08 September 2022. However, it lasted until 28 October 2022, as some participants requested additional time. Research coordinators and secretaries of the institutions facilitated the process. On the data collection date, the questionnaires were hand-delivered to potential participants; some opted for a soft copy, which was shared via email. Potential participants were approached individually. After the information about the study was explained and all questions asked by the potential participant were answered to their satisfaction, a consent form was signed on the contact date, and they were then enrolled in the study. The questionnaires were self-administered, so each participant completed them using pen-paper or typed their responses for those who opted for a soft copy.

3.5.7 Data Management

The researcher thoroughly checked the data for accuracy and completeness. Upon receiving the completed tool from each participant, it was filed in a folder using a code and then kept in a locked drawer. Emailed responses were also treated with confidentiality. Upon receiving the email, the completed tool was downloaded, coded and filed in a password-protected folder on the computer. There were no incomplete or missing data in survey tools, so all participants' responses are protected, as stated above.

3.5.8 Data Analysis

Data analysis is the process of inferring the meaning of findings (Polit and Beck, 2017). Data in quantitative survey research are analysed using either descriptive or inferential statistics (Gray et al., 2017; Polit and Beck, 2017; Brink et al., 2018). The data were entered into a Statistical Package for the Social Sciences (SPSS) version 20.0 and analysed using descriptive statistics to generate frequencies, means and percentages. Finally, the data were presented in tables and charts. Data interpretation for Survey B was guided by FoisyDoll and Leighton's (2017a) SCORS Guidebook.

According to Foisy-Doll and Leighton (2017a), data interpretation should include the item mean scores and overall mean scores analysis. Computing the item mean score requires establishing the benchmark point, which should be within the 5-point Likert score (1 to 5). However, it should be configured from the mid-point (3-5). The selected score represents the acceptable mean score, and if achieved, it indicates that the institution is ready to implement simulation. However, an item score below the benchmark indicates a lack of readiness, meaning an intervention is required to achieve readiness (Foisy-Doll and Leighton, 2017a). A benchmark or an acceptable mean score of 3 was selected for this study.

The computation of the overall mean score refers to the total item scores, which range between a minimum of 36 and a maximum of 180 (Foisy-Doll and Leighton, 2017a). The interpretation of the overall score informs about the readiness for simulation and integration. The meaning of the overall score is interpreted as follows: 1-36= not ready; 37-72= a little; 73-108=somewhat, 109-144=moderately and 145-180=very much (Foisy-Doll and Leighton, 2017a). The overall impression of the scores can also be used in the analysis of the SCORS findings: 1=not ready, 2=getting ready, 3=been ready but not acting, 4=ready to start to act and 5=past ready and into action and planning (Foisy-Doll and Leighton, 2017a).

Aside from the above score, areas that need improvement can be identified by analysing each section, enabling the institution to establish the aspects that need intervention to improve simulation readiness.

3.6 PHASE 3: ITERATIVE RESEARCH PROCESS

3.6.1 Introduction

The third phase of this study sought to develop a framework for integrating simulation into the Bachelor of Nursing Science programme in Eswatini. The scoping review and survey findings were integrated to develop the framework using the NLN Jeffries Simulation Theoretical Model as a guide. A qualitative iterative research approach directed the research process.

3.6.2 Qualitative Research

A qualitative research approach is used to study human experiences, feelings, perceptions and social processes based on subjective views to generate textual data (Gray et al., 2017; Brink et al., 2018; Creswell and Poth, 2018; Polit and Beck, 2018). Furthermore, qualitative studies involve people knowledgeable about the area of interest to help provide in-depth knowledge about the phenomena (Gray et al., 2017; Brink et al., 2018; Creswell and Poth, 2018; Polit and Beck, 2018). In this study, experts' opinions were solicited to inform about the elements to be considered when developing a framework for integrating simulation into the Bachelor of Nursing Science programme in Eswatini.

3.6.3 Iterative Research Process

An iterative process is used in qualitative inquiries (Srivastava and Hopwood, 2009; Durepos and Wiebe, 2010; Gaudet and Robert, 2018). Iterative is a systematic approach that repeatedly and recursively searches for meaning through reflexible reasoning (Durepos and Wiebe, 2010; Gaudet and Robert, 2018). In addition, the iterative approach leads to discovering and recognising priority elements of the problem under study, and the process continues until the research question is answered (Durepos and Wiebe, 2010). Gaudet and Robert (2018) revealed that it encompasses observing situations, discourses, practices, and representations or narratives. The participant should have in-depth knowledge of the subject (Durepos and Wiebe, 2010). The nature of this methodological approach was suitable for this study problem, as developing the framework required triangulation of the findings from phase 1-scoping review and phase 2- surveys to generate lessons learned (best practices and areas that need priority interventions, respectively) iteratively. Simulation experts addressed the research problem, and the inquiry process was guided by the NLN Jeffries Simulation Theory model (attached in Annexure 18).

3.6.4 Research Setting

The data was collected virtually via Microsoft Teams. This setting was deemed appropriate because the experts were in different geographical locations, but all had access to the internet and were familiar with Microsoft Teams. The researcher is based at the University

of Eswatini. One expert was from South Africa, the University of the Witwatersrand, and the other was from the United Kingdom at the University of Gloucestershire.

3.6.5 Population

The study population were nurse educators with expertise in simulation-based principles and processes. Initially, the plan was to collect data from a larger group of simulation experts within the Southern Africa Region, and at least one should be from the European community identified through their research work in simulation. The plan did not succeed because of time constraints; meeting at the convenience of all participants via the virtual platform was not feasible. However, those who took part satisfied the inclusion criteria of this study.

A brief description of the study's key informants is that both are experienced nurse educators who published research in simulation. One of the experts is a certified healthcare simulation educator (CHSE) by the Society for Simulation in Healthcare (SSH) and an active member of the International Nursing Association for Clinical Simulation and Learning (INACSL). Additionally, the expert was a simulation champion at the University of Witwatersrand Department of Nursing and was appointed the simulation director for all healthcare disciplines. The expert described is currently based in the United Kingdom at the University of Gloucestershire, where she established the simulation programme for the healthcare institution. She brought local and international experts into the study. At the same time, the researcher holds a speciality in nursing education involved in the educational preparation of nursing students for theory and clinical practice through simulations and clinical field experience and has acquired simulation skills through experience and reading the literature.

3.6.5.1 Inclusion criteria:

- Nurse educators working within a tertiary education institution.
- Familiar with the NLN Jeffries Simulation Theory.
- Published research work in simulation.
- Have access to the internet.
- Worked in healthcare education institutions in the sub-Saharan Africa context
- Willing to take part in this study.

3.6.5.2 Exclusion criteria

- None nurse educators.
- Neither speaks or writes in the English language.

3.6.6 Sampling

Qualitative sampling techniques enable the selected population to be sampled through non-random methods. The commonly used qualitative sampling techniques include purposive, snowball, quota, and convenience. (Gray et al., 2017; Polit and Beck, 2017; Brink et al., 2018; Creswell and Poth, 2018). In this study, purposive sampling was used.

3.6.6.1 Purposive Sampling Technique

Purposive sampling permits the investigator to select participants who have been through a particular experience and are conversant with the subject matter (Polit and Beck, 2017; Brink et al., 2018). The study participants were purposefully selected based on the inclusion criteria to ensure that only candidates with expertise in simulation-based education would inform the study objective.

3.6.6.2 Sample size

In qualitative studies, the sample size is determined based on the study design, and rough estimates can be made in advance (Creswell and Creswell, 2018). However, each type of qualitative study has a recommended sample size. For example, phenomenology could include about 3 to 10 individuals; grounded theory, 20 to 30; ethnography examines one cultural group; case studies could have four to five cases, and narratives could suffice with one or two individuals (Creswell and Creswell, 2018). Furthermore, focus groups are included in the standard or expected sample sizes list and should have about 4-12 participants (Gray et al., 2017). Included in this study were two (n=2) experts with expertise in nursing and simulation learning.

3.6.7 Data Collection

Data collection in qualitative research is gathered using a tool. Unlike quantitative research, the tool can contain one open-ended question for unstructured and semi-structured interviews, consisting of specific questions and probes (Brink et al., 2018). Lastly, there are structured interviews that require the development of an interview schedule to obtain factual information. This phase aimed to collect data to develop a framework for integrating simulation into the BN Sc programme in Eswatini. The data collection process was achieved through an unstructured interview approach.

3.6.7.1 Data Collection Tool

The question that drove the inquiry was: “What elements should be considered to develop a simulation framework that could assist Eswatini nurse educators in integrating simulation into the Bachelor of Nursing Science programme?” The NLN Jeffries Simulation Theory model (Annexure 18) concepts (i) context, (ii) background, (iii) design, (iv) simulation experience (facilitator and educational strategies, and participant), and (v) outcomes served as a guide for simulation-based education special considerations. The rationale was to develop a simulation framework grounded on solid theoretical foundations of simulation-based education knowledge and empirical evidence. The following questions were answered:

(i) What information should be considered in the ***context*** of the Eswatini simulation framework?

(ii) What information should be considered in the ***background*** of the Eswatini simulation framework?

(iii) What information should be considered in the ***design*** of the Eswatini simulation framework?

(iv) What information should be considered in the ***simulation experience*** criteria element ***(facilitator, educational strategies, and participant***) for the Eswatini simulation framework?

(v) What information should be considered in the ***outcomes*** criteria element for the Eswatini simulation framework?

3.6.7.2 Data Collection Process

The development of the framework was achieved through an iterative reflexive data collection procedure. The concept of iterative reflexive entails “visiting and revisiting the data and connecting them with emerging insights, progressively leading to refined focus and understandings” (Srivastava and Hopwood, 2009, p.77). The data source used to address the current study question was the outcome of mixing the different levels of analysis: qualitative data from the scoping review and quantitative data from the survey, resulting in meta-inferences.

The process of drawing the meta-inferences was achieved through an iterative reflexive process to deduce meaningful lessons from the findings of phases 1 and 2. The analysis product (lesson learned) from this data triangulation process provided the basis for addressing the phase 3 problem. The lessons are presented in Table 6.1. The integrated findings (tabulated meta-inferences) were shared with the experts in a Word document via email three weeks before the data collection date. A summary of the NLN Jeffries simulation theory concepts was also shared with the study participants (experts) for review to familiarise themselves with the content.

The data collection meeting was held via Microsoft Team and lasted 1 hour and 17 minutes. The data collection starting point was a discussion on the aspect that needs to be considered to develop an evidence-based framework suitable for assisting Eswatini nurse educators in embedding simulation into the Bachelor of Nursing Science programme. An iterative review process was the inquiry process that helped in achieving the goal. The experts recommended what should be included in the Eswatini framework through reflexive thinking and guided by the NLN Jeffries simulation theory. The NLN Jeffries simulation theory concepts guided the experts on the crucial elements (building blocks) that should feature in the planned simulation framework; see a sample of data transcripts attached in Annexure 24.

3.6.8 Data Analysis

Data analysis leading to the framework's development was concurrently done during the data collection phase. The experts emphasised that the framework has to be implementable in Eswatini. Therefore, the experts advised as follows:

Step 1: Use the NLN Jeffries simulation theory concept as a structure that describes the ideal situation for Eswatini regarding the context, background, design, simulation experience and outcomes.
Step 2: The first part would be a background explaining the outcomes for this framework and stating what the outcome should be. The outcome should be drawn from the scoping review, contextualised knowledge, and a rationale for the chosen outcome. The rationale should be drawn from the survey (phase 2) output.

Step 3: You then have to state when each item of the framework should happen. Use a stepwise and phase-based approach, for instance, 6 months, 1 year, 2 years, 3 years and 5 years. The plan was to start small and gradually increase simulation uptake when the basic principles have been achieved; see analysis in Annexure 25 and the final implementation plan in Table 6.2 in Chapter six.

3.7 PHASE FOUR: DELPHI METHOD

3.7.1 Introduction

In the fourth phase of this study, the researcher evaluated the developed framework's utility in assisting Eswatini educators in integrating simulation into the Bachelor of Nursing Science programme. Eswatini nurse educators involved in clinical teaching using simulation were engaged in this study to solicit group opinion about the relevance and feasibility of the identified aspects of the developed framework and achieve consensus.

3.7.2 Description of the Delphi Research Method

A Delphi technique is a "multi-stage survey" method intended to gain consensus on an important matter that is newly developed involving a group of experts (Keeney et al., 2011,

p.3; Makhmutov, 2021). It employs an iterative process to reach the decision point (Polit and Beck, 2018), informed judgement (Keeney et al., 2011) and relies on 'subjective probability assessments' (Linstone and Turoff, 2002, p. 565). In addition, Green (2014) says it is a valuable strategy for informing the development of guidelines and standards in educational institutions. Hence, it was used in this study because the developed framework is planned to serve as guidelines for integrating simulation into the Bachelor of Nursing Science in Eswatini nursing education institutions.

Researchers use various forms or classes of the Delphi technique: modified, policy, real-time, and conventional, group, fuzzy, argumentative (Linstone and Turoff, 2002; Keeney et al., 2011; Spranger et al., 2022). However, these different forms have raised credibility criticisms compared with the original/classic Delphi process involving two or more rounds (Keeney et al., 2011; Green, 2014).

Reaching consensus is a priority in Delphi studies; however, there seems to be no definitive approach to determining it (Diamond et al., 2014). Diamond et al. (2014) conducted a systematic review to investigate how consensus is defined in the Delphi study within 98 studies. Some researchers reported reaching it without being prescriptive, while others claimed it was achieved by percentage agreement, median threshold or a predetermined threshold (Diamond et al., 2014). Either way, such findings align with the foundational principles of this method.

In nursing and healthcare research, the Delphi technique can serve two purposes: (a) identifying priority areas and (b) gaining consensus by ranking statements (Keeney et al., 2011). The former is without measurement, whilst the latter is characterised by a set level of consensus, such as 70% (Keeney et al., 2011), by rating scaled items in a questionnaire (Green, 2014). In this study, the experts were asked to rank statements. The consensus level was set at 80% for each item, and reasons were asked for any partially agreed or disagreed responses.

3.7.3 Research Setting

The study was conducted in Eswatini nursing education institutions involved in the educational preparation of the Bachelor of Nursing Science degree students. This study's goal drove the selection of this setting; it aimed to integrate simulation into the Bachelor of Nursing Science in Eswatini. Therefore, to ascertain utility, the framework relevance and feasibility status were evaluated within the context of the potential product users. In Eswatini, there are three universities, UNESWA, SANU and EMCU, that use simulation to train nurses for the Bachelor of Nursing Science Degree. Each of these nursing education institutions has a simulation centre or demonstration laboratory. UNESWA has two simulation laboratories, one for midwifery and the other for general nursing.

3.7.4 Population

The Eswatini nurse educators from the three universities (UNESWA, SANU and EMCU) were selected to participate in this study to gain a group opinion regarding the framework's relevance and feasibility from the simulation users. The estimated target population of nursing educators were (N=49).

3.7.5 Sampling

Delphi surveys use non-random sampling methods. The utilisation of a non-random sampling technique is based on the notion that an ‘expert’ is every person who fits the researcher's definition in terms of the needs of the study (Keeney et al., 2011). Therefore, a purposive sampling technique was utilised in the study, guided by inclusion and exclusion criteria.

3.7.5.1 Inclusion criteria

- Nurse educators who were teaching using simulation modalities.
- Nurse educators who were teaching clinical courses.
- Nurse educators who participated in the survey study.

3.7.5.2 Exclusion criterion

- Part-time nurse educators.

– Nurse educators who were away on study leave.

3.7.6 Sample Size

There is no consensus on the sample size required for Delphi surveys (Makhmutov, 2021). For example, some vary from ten (10) to no upper limit (Keeney et al., 2011), whereas Makhmutov (2021) reported that most published studies had used a sample of 10 to 100 experts. On the other hand, Cole (2005) revealed that a reliable consensus could be achieved with a small sample as long as the inclusion criteria were strictly controlled. Novakowski (2008) reported that researchers should be concerned with the variety of experts invited to the study instead of the numerical size. Sixteen (16) experts who met the inclusion criteria were invited into this study, and all responded. Therefore, the sample size for round one was (n=16). Fifteen (n=15) participated in round two (94%).

3.7.7 Data Collection

Delphi data collection consists of two or more rounds or phases (Keeney et al., 2011; Green, 2014). Subsequent rounds follow when consensus is not reached in the first two rounds (Keeney et al., 2011; Green, 2014). Green (2014) outlined steps for guiding the data collection process, which was used to direct this study. The Delphi data collection process steps by Green (2014) are summarised as follows:

I. First round: its purpose is to form issues.
II. The second round provides the experts with feedback from the first round and presents them with a questionnaire.
III. The third-round entails asking the individuals to reevaluate their opinions when they differ significantly from the other experts.

Keeney et al. (2011) highlighted that the first round is for getting an underlying idea of the presented issue and is done using open-ended questions. However, the authors suggested that it has become common for scholars to use the literature to develop ranking responses. A similar format was used in this study. The Delphi study was part of a sequential mixed design study effected in phase three, where the issues, statements, or activities to be

assessed for relevance and feasibility were generated. In this phase, the Eswatini nurse educators assessed pre-determined scale items of the framework.

3.7.7.1 Data Collection Tool

Delphi surveys are collected using face-to-face or self-administered questionnaires (Keeney et al., 2011). The Delphi questionnaire was developed using the activities of the framework's implementation plan tabulated in Table 6.2 under the guidance of the supervisors. The tool was pretested among three educators.

Round one of the Delphi survey questionnaire was divided into two sections. The first section consisted of the participant's demographic characteristics, and the second section contained the main components of the research problem arranged in five domains. Domain A: Training Preparation of Educators; Domain B: Integrating Simulation into the Midwifery Programme; Domain C: Simulation Equipment; Domain D: Infrastructure and Domain E: Students/Simulation Participants. Each domain had a set of activity items spread over three phases: 1-6 months, 7 months to 2 years, and 3-5 years. The phases indicated the time in which that activity should be accomplished. The experts were requested to evaluate each activity for relevance and feasibility using a three-point scale option: agree, partially agree and disagree. The participants were also requested to comment if they partially agreed or disagreed. The tool is attached in Annexure 19.

Round two's tool consisted of 10 structured open-ended questions for activity items that did not reach the 80% consensus rate on the feasibility status in round one. The first part of the tool contained a summary of round one results, then the tool components.

Organisation of the second round of the Delphi survey tool: the activities were organised under the respective domains. The activity was identified, its results were presented underneath it, and that step was followed by a general comment drawn from the experts' responses, explaining why it was not considered feasible. A researcher's comment and a question followed, which clarified the concept. Then, the participants were asked to reevaluate the activity and advised on what should be done to achieve feasibility. The tool is attached in Annexure 20.

3.7.7.2 Process of Data Collection

Participants in the study were recruited or identified through the phase two survey study sociodemographic information findings as guided by the pre-determined sampling criteria. The data collection tool was hand-delivered to most, but some were delivered electronically via email to selected experts as per their request. The use of an electronic data capturing system such as REDCap (Research Electronic Data Capture) was proposed in the conceptualisation of the study for its multiple benefits, including anonymity. However, the use of such a system was deemed not feasible as the majority of the participants opted for hard copies due to limited access to free internet and staff emails that are often down or unavailable as a result of server issues. In the information sheet, participants were made aware that there would be subsequent rounds if a consensus was not reached, and each participant was asked to share their email address to facilitate that process. The round one data collection activity was planned to last four weeks, and feedback from participants was given within the time frame. The same timeframe was planned for round two; however, the majority responded after receiving two or three reminders, citing being busy with exams in one institution, some forgetting, and others misplacing the questionnaire. Overall, round two data collection was completed after seven weeks.

3.7.8 Data Analysis

In Delphi studies, individuals receive feedback for each round as data are analysed and recirculated (Keeney et al., 2011). Data from the questionnaire is analysed using descriptive statistics to determine frequencies, which is meant for identifying statements that have reached consensus (Keeney et al., 2011; Green, 2014). Statements that have reached consensus can be removed in the subsequent questionnaire round to reduce the tool's content; however, others oppose eliminating those statements (Keeney et al., 2011). In addition, a percentage for determining consensus must be set and agreed upon; the literature considers 70% to be an acceptable consensus rate (Keeney et al., 2011; Mcdermott, 2016). In this study, 80% was the acceptable consensus score rate.

The data set generated in round one was analysed using descriptive statistics. The data was computed using the Statistical Package for Social Science (SPSS) version 20.0 to generate frequencies and percentages for each item to measure the degree to which all the participants agreed with the relevance or feasibility of the framework activities.

In round two, the data were analysed using Hsieh and Shannon's (2005) qualitative content analysis method employing the directed approach. The purpose was to identify and categorise data that informed about strategies for enhancing the feasibility of the activities that did not reach a consensus in the first round. Textual data was gathered through the self-administered hand-written open-ended survey questions. Participants were asked to review and explain how the feasibility of the activities that did not reach a consensus in the first round could be achieved.

The directed content analysis approach is used when there is an “existing theory or research that can help focus the research question” (Hsieh and Shannon, 2005, p. 1281). In addition, data are generated using open-ended questions from predetermined categories (Hsieh and Shannon, 2005). In this research, targeted questions were formulated from the 10 activities that did not reach a consensus regarding feasibility within their existing domains (category) to address the study problem (data collection tool in annexure 20).

Steps in the Hsieh and Shannon (2005) directed content analysis method and its application in this study:

(i) Thorough reading of transcripts. The researcher read the transcripts repeatedly to infer the meaning of the findings.
(ii) Highlight the text that addresses the phenomena of interest. In this study, data that informed about the strategies for enhancing feasibility were highlighted with a coloured font colour (see Annexure 27).
(iii) Text that could not be coded into existing categories should be given a new label/code. In this study, all data fit into the existing categories.
(iv) After coding, data for each category must be re-examined to determine the need for subcategories. The researcher re-examined the data, and no subcategories were identified.

3.8 RESEARCH RIGOUR

The mixed methods design allows the meticulous selection of methods founded on the quantitative and qualitative paradigms to answer the research question. The researcher ensured rigour by adhering to the procedures inherent to each research approach, from the conceptualisation of the problem to the empirical phase and interpretation of the evidence. The rigour in quantitative research is evaluated through validity and reliability, while qualitative researchers strive to ensure trustworthiness (Gray et al., 2017; Brink et al., 2018; Creswell and Poth, 2018; Polit and Beck, 2018).

3.8.1 Rigour in Quantitative Research Methods

The quantitative approach informed the development and interpretation of findings in phases two (simulation audit and educators survey) and four (round one Delphi study) of this study. The aspects of validity and reliability were ensured as follows:

3.8.1.1 Reliability

Reliability refers to the accuracy and consistency of the information obtained using the data collection instrument (Polit and Beck, 2017). The researcher used a validated data collection tool that has been tested for reliability. A Cronbach's alpha coefficient ranges from 0.00 to 1.0; however, any value closer to 1.0 (0.9, .08, 0.7) is desirable when testing internal consistency as it signifies strong reliability (Gray et al., 2017; Polit and Beck, 2017). The overall Cronbach's alpha coefficient subscale scores of the SCORS tool are reported at 0.96 (Foisy-Doll and Leighton, 2017b; Leighton et al., 2018). The Cronbach alpha subscale scores were as follows: need (section A) = 0.92, readiness (section B) =0.87, resources (section C)=0,92, sustainability (section D) = 0.72 (Foisy-Doll and Leighton, 2017b).

Delphi studies adhere to the same processes of establishing methodological rigour in quantitative research (Keeney et al., 2011). In the Delphi survey, the subscale score of 0.7 is desirable (Keeney et al.,2011). The researcher developed the Delphi survey instrument, which the research supervisor reviewed and approved. The tool was pretested among three independent educators. The data was interpreted using SPSS to determine the internal consistency of the questions using Cronbach’s Alpha test.

The subscale scores under the relevance section showed weak internal consistencies compared with the aspect of feasibility in the pretest results. The pretest sample reported wording and language issues that resulted in misinterpretation of the activities to be evaluated. The feedback was incorporated to resolve the identified issues, and the tool was administered to the main study sample; no concerns were raised. The Cronbach's alpha subscale scores yielded in the pre-test study are tabulated below:

Table 3.4 Cronbach's Alpha Subscale Scores

Subscales	Relevance Cronbach's Alpha total subscale scores	Feasibility Cronbach's Alpha total subscale scores
Domain A: Training of educators	0.523	0.546
Domain B: Integration of simulation	0.791	0.722
Domain C: Equipment	0.00	0.878
Domain D: Infrastructure	0.281	0.756
Domain E: students	0.00	0.00

3.8.1.2 Validity

Validity denotes the extent to which the instrument measures its intended purpose in the study (Keeney et al.,2011; Gray et al., 2017; Brink et al., 2018; Creswell and Creswell, 2018; Polit and Beck, 2018). Validity can be ascertained by ensuring internal and external validity, content validity, face validity, and concurrent validity (Keeney et al., 2011; Gray et al., 2017; Polit and Beck, 2017; Brink et al., 2018).

The research supervisors assessed all the data collection tools used in this study for face and content validity. A psychometric evaluation was done for the SCORS instrument, and the content validity index was reported at 0.67 to 1.00, while two items obtained an index score of 0.50 for the SCORS tool (Leighton et al., 2018).

3.8.2 Rigour in Qualitative Research Methods: Trustworthiness

Trustworthiness is the umbrella term for ascertaining rigour in a qualitative study. Lincoln and Guba (1985) established four evaluative criteria for ensuring trustworthiness, an aspect that informs the reader about the truthfulness and worthiness of the study findings. They include credibility, transferability, dependability, and confirmability (Lincoln and Guba, 1985).

The identified evaluating criteria were satisfied in this study to establish the rigour of the qualitative components incorporated in this mixed methods research approach. Therefore, trustworthiness was ensured in phase one of the scoping review systematic study; phase three led to the framework's development, and phase four in round two of the Delphi study to explain the quantitative findings.

3.8.2.1 Credibility

Credibility (internal validity) is achieved through five activities: prolonged engagement, persistent observation, triangulation, peer briefing and member checking (Lincoln and Guba, 1985; Gray et al., 2017; Brink et al., 2018; Creswell and Creswell, 2018; Polit and Beck, 2018).

Prolonged engagement is one of the activities carried out to produce credible findings and conclusions that reflect the data sources. Before embarking on the scoping review research, the researcher got training with the JBI group to be equipped on how to engage with the data to generate credible scoping review findings. Also, an iterative research process was used in the scoping review study and during the framework development, leading to the extraction of relevant findings. The iterative process also informed the interpretation of findings.

The peer debriefing technique was utilised during the scoping review data extraction process, whereby the third reviewer cross-examined the findings generated by the researcher and the second reviewer for alignment with the inclusion criteria. Finally, member checking, the research supervisor checked the analytic interpretations and conclusions drawn from the raw data, and corrections were incorporated accordingly in each section.

3.8.2.2 Transferability

This evaluative criterion is satisfied when the researcher provides a sufficient description of the data set (thick description) to enable other users to judge whether it would be applicable in their context (Lincoln and Guba, 1985; Polit and Beck, 2018). It establishes external validity in a naturalistic inquiry (Lincoln and Guba, 1985). The researcher met this criterion

by providing a detailed description of the participants' characteristics, analysis procedures and interpretations to enable other data users to determine the transferability of the findings to similar contexts.

3.8.2.3 Dependability

The dependability criterion is equated to the aspect of reliability (Lincoln and Guba, 1985). Dependability establishes whether the findings can remain stable if the inquiry is tested over time with the same population and context (Polit and Beck, 2018). The researcher has implemented the research designs and methods explained in this research study. Also, dependability was ensured by using a written protocol when conducting the scoping review and an interview guide to collect the data for developing the framework for integrating simulation into the Bachelor of Nursing Science programme. In addition, an audit trail of the research processes that yielded this study's findings has been kept to make it possible for other users to examine their dependability.

3.8.2.4 Confirmability

Confirmability is about the objectivity of the findings, which means the conclusions drawn reflect the participants' views rather than the researcher’s perspectives (Polit and Beck, 2018). It is established through a confirmability audit (Lincoln and Guba, 1985). Some researcher bias in the implementation and analysis process was minimised in this study. A consensus was reached by the three independent scoping review reviewers on the articles that were included in the study. Also, a consensus on the utility framework for integrating simulation into the Bachelor of Nursing Science programme in Eswatini was solicited through a Delphi study. The researcher also ensured confirmability by keeping an audit trail of the following during data collection: scoping review reviewers' conclusions, voice recording of interviews, samples of reviewers' feedback and transcripts (Annexures 21, 22 and 24), and data reconstruction (Annexures 23 and 25). The research supervisors were the internal auditors; they reviewed all the tools, analysis processes and outcomes. Each section was corrected accordingly based on the supervisor's feedback.

3.9 ETHICAL CONSIDERATIONS

The researcher developed a research proposal and submitted it to the Faculty of Health Science Postgraduate Research Committee for review and approval. The protocol title was approved (Annexure 1). After the approval by the committee as mentioned above, the protocol was submitted to the University of Witwatersrand Human Research Ethics Committee for ethical clearance (Annexure 2). The study protocol was further submitted and approved by the Eswatini Health and Human Research Review Board (Annexure 3). Following receipt of ethical clearances, permission to collect data in the proposed study sites was requested and granted by all the study sites (Annexures 4, 5 and 6). The researcher observed the research ethical principles related to human beings: respect for persons, beneficence, justice, and informed consent. Two certificates, Introduction to Research Ethics and Good Clinical Practice (Annexure 7) were obtained to be certified in conducting research with human beings.

3.9.1 Informed consent

The researcher developed a participant information sheet (Annexure 8-11) and informed consent (Annexure 12-13) guided by the University of the Witwatersrand Research Committee guidelines. Each potential participant was verbally informed about the study and by sharing the hard/soft copy of the information. After that, potential participants were asked if they had any questions they would like clarity on; if yes, an explanation was given to their satisfaction. Moreover, if there were no questions, potential participants were asked if they would participate in the study. If yes, a consent form was given to them to sign.

3.9.2 Respect for Persons

The participants were advised that they had a right to choose whether to participate in the study or not. Also, they were informed that they could withdraw from the study at any time if they were no longer willing to participate and would not face prejudice or penalty. In this study, no participant withdrew, and it was without coercion.

3.9.3 Beneficence

The study did not involve any invasive intervention that could cause physical harm or emotional triggers that caused psychological damage. It was explained to the participants that there would be no direct benefits from participating in this study. However, the study's outcomes are hoped to enhance the current delivery of clinical teaching and learning methods in the Eswatini education context.

3.9.4 Justice

The sample selection criteria were based on the study's objectives. The participant's right to privacy was observed through adhering to the principles of confidentiality and anonymity. Data are kept strictly confidential; all soft copy data are stored in a password-protected computer, and hard copies in locked cardboard. Access to the study is strictly limited to the researcher and the research supervisors. The anonymity principle was ensured by removing all identifiers so that information could not be linked to a specific individual and their institution. Codes and quotes were used in the research report write-up, and the same will be maintained when disseminating the findings.

3.10 CONCLUSION

This chapter provided a detailed explanation of the philosophical stance, research design and methods and its application in guiding the research process for all the phases of this study. In addition, ethical considerations that were adhered to throughout the phases of the research process were discussed. The next chapter marks the initial step of the implementation phase for this study, which began with a scoping review. The chapter covered the presentation of the interpretation of the results and concluded with a discussion.

CHAPTER 4: SCOPING REVIEW

4.1 INTRODUCTION

This scoping review explored existing literature on best practices of simulation-based education in the educational preparation of undergraduate nursing students locally (sub-Saharan Africa) and internationally. The Joanna Briggs Institute (JBI) scoping review methodological approach guided the processes that led to the outcomes of this phase of the study. This chapter focuses on presenting and discussing the scoping phase study findings.

4.2 AIM

This scoping review aimed to identify and describe the evidence on best practices of simulation-based education integral to the educational preparation of undergraduate nursing students extracted from local and international literature. The underlying rationale was to establish existing evidence on what constitutes simulation best practices that can inform the integration of simulation-based education for students in the Bachelor of Nursing Science programme.

4.3 SCOPING REVIEW QUESTION

This scoping review sought to answer the question: “What evidence is available on best practices of simulation-based education that are integral to the educational preparation of undergraduate nursing students locally (sub-Saharan Africa) and internationally?”

4.4 INCLUSION CRITERIA

The JBI literature sources indicated that the scoping review inclusion criteria are denoted by an acronym PCC (population, concept and context) (Peters, Godfrey, Khalil, et al., 2015; Peters, Godfrey, Mclnerney et al., 2015; Peters et al., 2020). The review question informs on what should constitute the PCC criteria of the intended scoping review study (Peters et al., 2020). The PCC criteria for this study are shown in Table 4.1 below:

Table 4.1: Study's PCC (population, concept and context) Criteria

Inclusion Criteria	
Population	Undergraduate nursing students and nurse educators
Concept	Best practices in simulation-based nursing education
Context	• African region within the sub-Saharan Africa context and internationally (outside the African region) • Nursing and medical education institutions, including colleges, universities, clinical settings/hospitals, and simulation centres • Articles published in the English Language • All types of evidence (peer-reviewed studies and grey literature) • Date: Studies published from January 2010 to December 2022

4.5 SEARCH STRATEGY

The studies were searched and selected from five databases: Science Direct, Cumulative Index to Nursing & Allied Health (CINAHL), Sage Journals, Wiley Online Library, and the Education Resources Information Centre (ERIC), using the search string listed in the table below. Results are as shown in Table 4.2:

Table 4.2: Articles Generated from the Search Per Database

	DATABASES				
SEARCH STRING	**Science Direct**	**CINAHL**	**SAGE Journals**	**Wiley Online Library**	**ERIC**
nursing students AND simulation best practices	133	39	49	61	4
healthcare students AND simulation best practices	117	7	75	40	116
nurse educators AND simulation best practices	128	10	90	10	1
simulation education AND sub-Saharan Africa OR Africa OR Europe	50	12	2	10	18
simulation standards AND Nursing education AND Saharan Africa OR Africa OR Europe	2	39	4	0	18
Total Search per database	**430**	**107**	**220**	**121**	**157**

Overall Total Search	**1035**
Remaining after removal of duplications	**706**

4.6 SCREENING AND SELECTION OF EVIDENCE

The initial search generated one thousand and thirty-five (1035) articles; seven hundred and six (706) remained after removing duplications, including nine articles recovered from the reference list of other articles. These articles were screened for relevance using the title and abstract, and one hundred and thirty-one (131) articles remained. These articles were saved into a Mendeley Reference Manager for further review. At this stage, eligibility was ascertained by conducting a full-text screening. A total of seventy-one (71) articles were excluded as informed by the independent reviewers (researcher, second reviewer and the supervisor-final reviewer). Most of the excluded articles, 71.8% (n=51), did not include the population group because they included postgraduate nursing students and those in speciality programmes. A further 21.1% (n=15) were not focused on best practices in simulation-based nursing education, and some were removed due to data saturation. Lastly, 7% (n=5) of articles did not have full-text content; therefore, a detailed description of the best practices could not be ascertained.

A total of sixty (60) articles were included in this scoping review. The selection and screening process findings are presented using a PRISMA flow chart diagram adapted from the JBI 2015 Reviewers' Manual publication for scoping reviews (Peters, Godfrey, Mclnerney, *et al.*, 2015). Figure 4.1 depicts the findings:

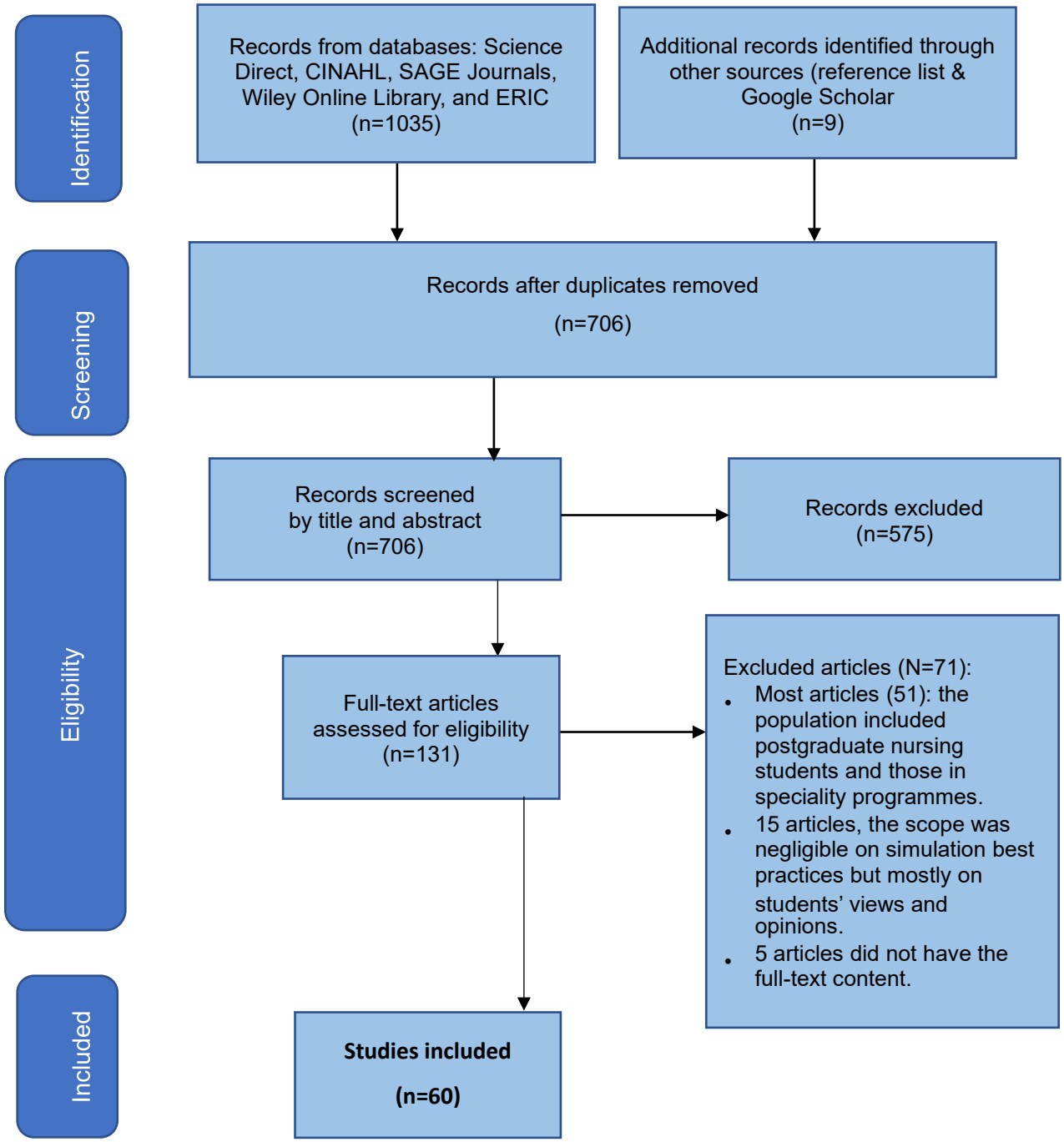


Figure 4.1: PRISMA flow chart diagram presenting the scoping review article selection process

4.7 Data Extraction

The evidence on simulation best practices was extracted from the sixty (60) articles identified through the search strategy described earlier. The study's data features the following

components extracted from the literature sources: author(s), year of publication, title, country of origin, study purpose/objective/question, population, sample size and findings (Annexure 14). The findings were further organised or grouped under related concepts.

The researcher initiated the data charting process, and the second reviewer also carried out an independent review as guided by the protocol inclusion criteria. Some disagreements were noted and resolved amicably by the supervisor, who validated the accuracy and relevance of the content based on the PCC criteria. The findings were charted, and the data matrix is presented in Annexure 21.

4.8 ANALYSIS OF EVIDENCE

After completing the data charting process, meaningful codes, categories and subcategories were deduced using Hsieh and Shannon's (2005) convectional content data analysis method. The analysis process is described in the methodology section. The research supervisor validated the accuracy of the coding process using the charted findings of the scoping review as a reference. The findings are attached in Annexure 22.

4.8.1 Characteristics of the Selected Articles

This section presents information about the characteristics of the articles that met the identified PCC (population, context and concept) of this scoping review.

4.8.1.1 The population group across the articles:

The population of interest in this scoping review were undergraduate/prelicensure nursing students/healthcare students and nurse educators/lecturers/faculty/clinical instructors involved in simulation-based education.

Most articles, 48.3% (n=29), involved nursing students. They were followed by simulation experts in nursing education, 28.3% (n=17) and nurse educators, 21.7% (n=13). One, 1.7%, n=1, was other undergraduate students/healthcare professionals. The findings indicate that diverse population groups inform the evidence on simulation best practices. Results are shown in Figure 4.2 below:

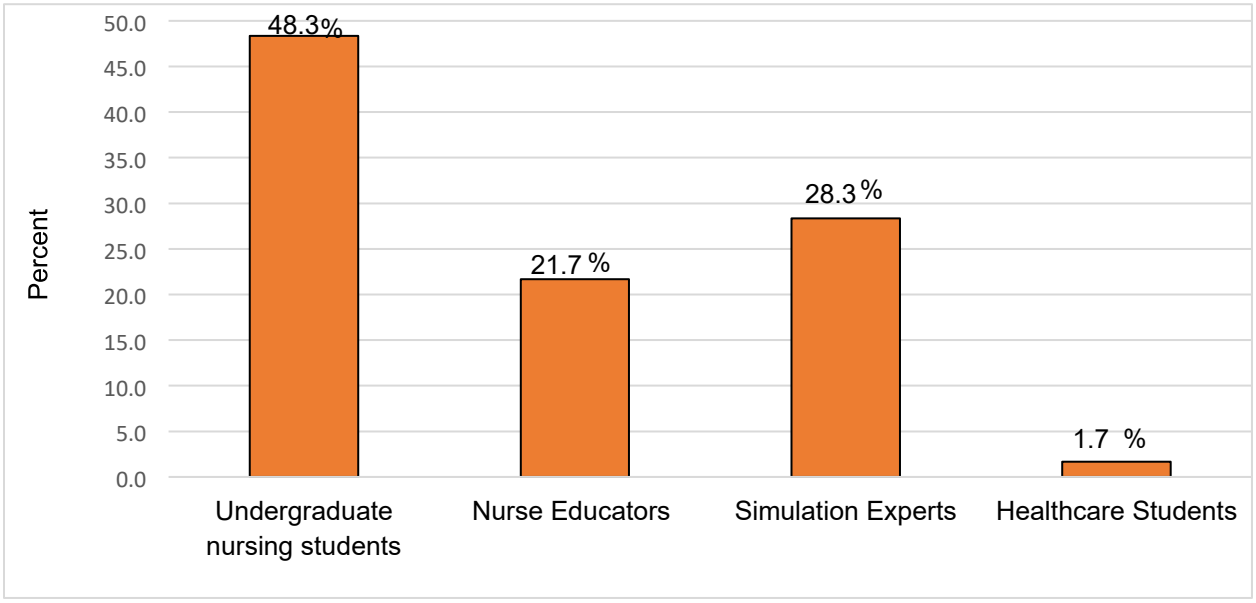


Figure 4.2: Population Characteristics of the Articles

4.8.1.2 Context of the selected articles:

The context of this scoping review was defined as local (Africa and the sub-Saharan region) and international. The findings are depicted in Figure 4.3 below:

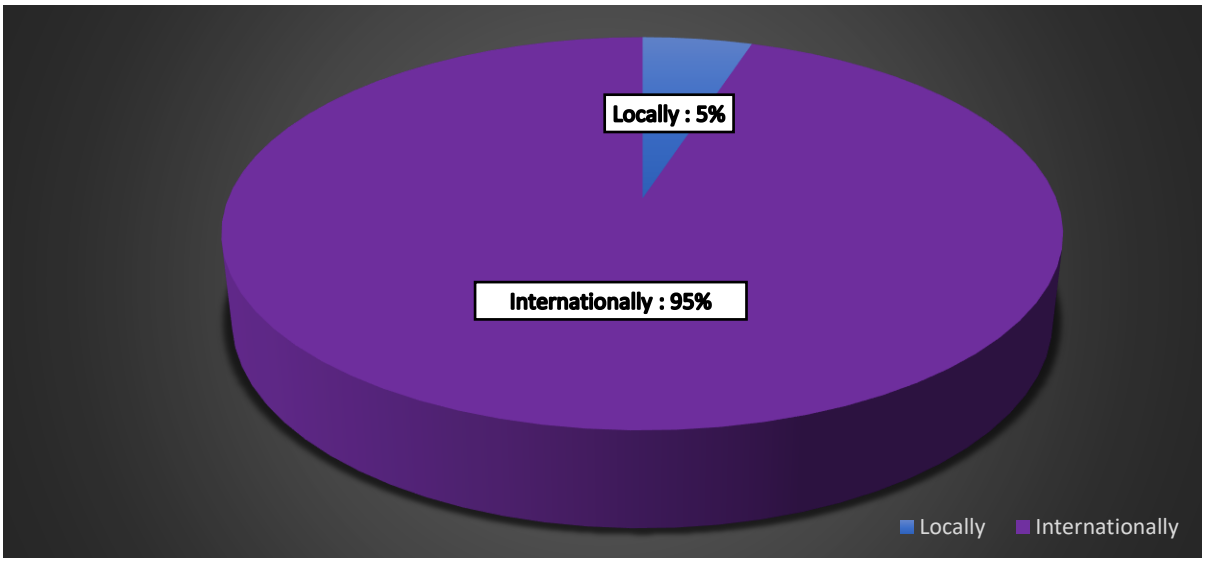


Figure 4.3: Shows the context of the included articles

Most of the studies were from the international context, 95% (n=57), while the local context provided 5% (n=3). The findings may signify that simulation is not much used in Africa or that the African context does not publish much research on simulation. The countries that

had the most relevant studies in this scoping review study were from the USA, 70% (n=42); Australia, 10% (n=6); and Canada, 8% (n=5), then South Africa, Lesotho, South Korea, Sweden, Singapore and France each contributed 2 % (n=1).

4.8.1.3 Types of Evidence Sources

The selected articles have used different methodological approaches to generate the findings that were of interest to this scoping review, as shown in Figure 4.4 below:

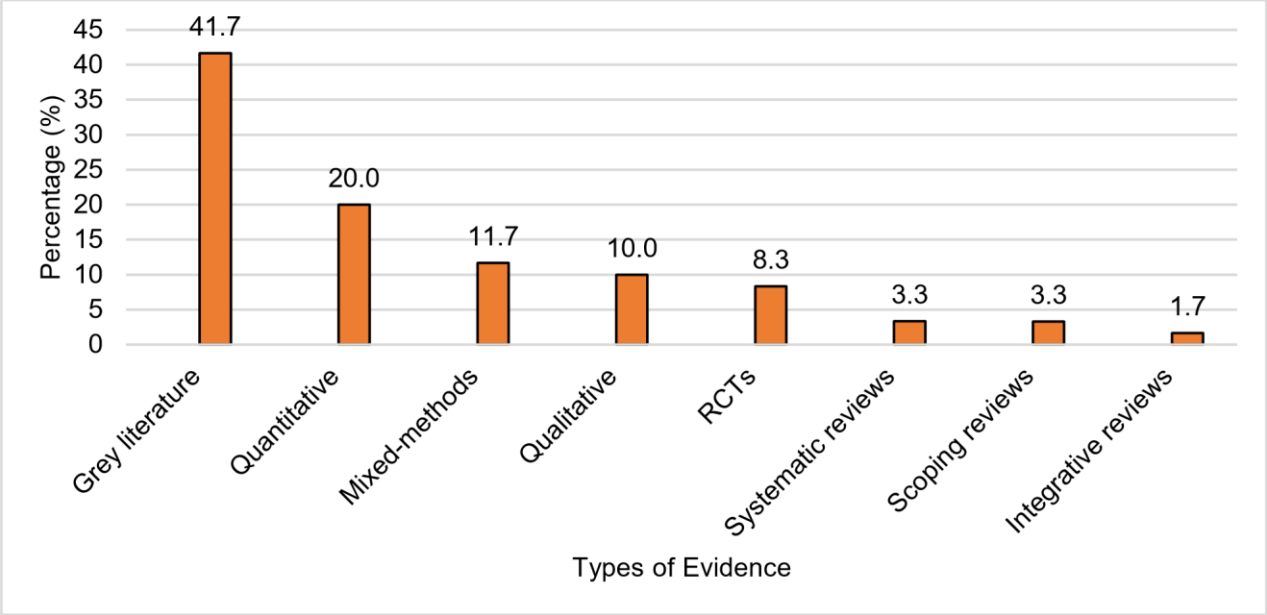


Figure 4.4: Types of Evidence Sources

Amongst the included studies, most were from grey literature 41.7% (n=25), which consisted of INACSL guidelines and standards, case studies, editors' reviews, experts' reviews and concept review papers; quantitative studies contributed 20% (n=12); qualitative 10% (n=6); mixed methods 11.7% (n=7), and randomised control trial 8.3% (n=5). Some types of evidence had less than 5%: systematic review studies 3.3% (n=2), scoping reviews 3.3% (n=2), and integrative reviews 1.7% (n=1). The findings indicate that all the levels (level-1 to level-7) of evidence-informed this scoping review.

4.9 PRESENTATION OF MAIN FINDINGS

This section presents the results of the scoping review and data that address the study concept of 'best practices in simulation-based nursing education'. Four (4) codes and fourteen (14) categories emerged from the extracted data findings of the sixty articles. Findings are presented in Table 4.3 below:

Table 4.3: Codes and Categories Emerged from the Key Findings

Code	Category
1. Lecturer preparation	• Faculty training needs • Faculty roles
2. Student elements	• Student Preparation • Instruction methods/practices • Student roles and responsibilities • Student competencies
3. Designing simulations	• Pre-briefing • Simulation Scenarios • Fidelity • Debriefing • Evaluations
4. Innovations in simulation	• Innovative teaching strategies • Virtual simulation • INACSL standards

4.9.1 Code1: Lecturer Preparation

Simulation-based education is a pedagogical approach that requires formal preparation. Lecturer preparation is integral to achieving quality simulation (Bryant et al., 2020; McFaden, 2020). The code lecturer preparation consists of two (2) categories: faculty training needs and roles. This study uses the term 'lecturer' interchangeably with 'nurse educator/simulation facilitator/instructor/faculty' and refers to someone facilitating the simulation-based learning experience.

4.9.1.1 Category 1: Faculty training needs

Faculty training needs include knowledge and skills in developing and implementing simulation curricula and facilitation skills (Alexander et al., 2015; Jeffries et al., 2015; Beroz, 2017; White, 2017; Dale-Tam et al., 2021; Herlihy, 2022). They should also be competent in planning and facilitating pre-briefing sessions (McDermott, 2016; Rutherford-Hemming, Lioce and Breymier, 2019; Tyerman et al., 2019; INACSL Standards Committee, McDermott et al., 2021). In addition, they require training on debriefing, feedback and evaluation processes (Hayden et al., 2014; Jeffries, Dreifuerst, Kardong-edgren et al., 2015; Beroz, 2017; Gordon, 2017; Aebersold, 2018; Dale-Tam et al., 2021).

Required technical skills and knowledge include being equipped with skills for operating the simulation technologies - mannequins and writing or developing simulation scenarios (Arthur, Levett-Jones and Kable, 2013; Jeffries et al., 2015; van Vuuren et al., 2018; Herlihy, 2022).

4.9.1.2 Category 2: Faculty roles

In simulation-based education, the educators plan, design, and implement simulation learning experiences (Kostovich, O'Rourke and Stephen, 2020; Davies et al., 2021; Herlihy, 2022). They also guide and support students in achieving their learning objectives (Alexander et al., 2015; White, 2017; Franklin et al., 2020). Other practical functions include establishing and maintaining psychological safety (Boese et al., 2013; Alexander et al., 2015; Kostovich et al., 2020) and enabling students to learn safely (Davies et al., 2020).

The following information is about the specific faculty roles for three major simulation design components: pre-briefing, scenario development and debriefing, as reported in the literature (Tyerman et al., 2016; Cant and Cooper, 2017).

Faculty roles during the pre-briefing phase:

During this phase, the lecturer prepares and engages in planning, designing, and facilitating pre-simulation learning activities, orientations, and briefing sessions (Franklin et al., 2013; White, 2017; Kostovich et al., 2020), as per the students' level of knowledge and experience (Boese et al., 2013; Franklin et al., 2013). In addition, the lecturer facilitates the learning

experience, identifies the students' learning gaps, clarifies the students' expectations, communicates the learning objectives and assigns students roles (Franklin et al., 2013) to meet the simulation experience outcomes (Boese et al., 2013; Alexander et al., 2015; Beroz, 2017).

Faculty roles during the simulation scenario phase:

The faculty are tasked with identifying, designing, and implementing the scenario, which they achieve by conducting a needs assessment to inform the scenario development process (Alexander et al., 2015; Reibel et al., 2019). However, readily made simulation scenarios are available in mannequin vendor shops (Hayden et al., 2014). Additionally, during the simulation experience, the faculty observes the students (Kostovich et al., 2020), maintain appropriate fidelity (Boese et al., 2013), initiate cues (Franklin et al., 2013; White, 2017), and evaluate the learners' performance (Beroz, 2017).

Faculty roles during the debriefing and feedback phase:

During the debriefing phase, the identified faculty role includes assisting the learners in integrating theory into practice (Arthur et al., 2013). They achieve this by leading the reflection process (Decker et al., 2013) using standardised debriefing frameworks/methods to offer effective feedback (Alexander et al., 2015; Jeffries et al., 2015; Beroz, 2017) and correct any mistakes or knowledge gaps noted during the simulation experience (Dale-Tamet et a., 2021). They also become conversational guides to facilitate student learning and guide them toward achieving the simulation experience objectives (Sawyer et al., 2016).

Another vital aspect ascribed to the educators' roles is the provision of feedback. Feedback is an educational tool for assisting students in acquiring knowledge (Aebersold, 2018). The faculty mainly offers formative feedback during the simulation experience (Boese et al., 2013).

4.9.2 Code 2: Student Elements

The ‘student elements’ code comprises four categories: student preparation, instruction methods/practices, student roles, and student competencies.

4.9.2.1 Category 1: Student preparation

The element of student preparation appears in multiple pieces of literature as a key for getting learners ready for a simulation learning experience (Arthur et al., 2013; McDermott, 2016, 2020; Reibel et al., 2019; Tyerman et al., 2019; Herlihy and Teel, 2020a; Kostovich et al., 2020; Herlihy, 2021; INACSL (Standards Committee et al., 2021; Ludlow, 2021). Student preparation entails activities the learners cover before the simulation experience and materials/resources used in the process (Tyerman et al., 2019; Herlihy and Teel, 2020a; INACSL Standards Committee and McDermott et al., 2021).

Student preparation activities and materials/resources:

The preparatory activities include various learning content and assignments that the student undertakes in preparation for the planned simulation scenario (Tyerman et al., 2019; Herlihy and Teel, 2020). These activities could include: reading assigned literature, watching audiovisual materials, reviewing simulated patient healthcare records, care plan exercises, reviewing procedure manuals, completing pre-tests/quizzes, reviewing patient records/case studies, practising skills required for the simulation experience, attending lectures about the intended simulation experience, virtual simulation activities, discussion and watching videos of a simulated patient and practising skills to be performed during the simulation experience (White, 2017; Reibel et al., 2019; Tyerman et al., 2019; Herlihy and Teel, 2020; INACSL Standards Committee, McDermott, et al., 2021; Ludlow, 2021).

4.9.2.2 Category 2: Instruction methods/practices

This subcategory presents the instruction methods/practices that enable students to achieve the intended simulation outcomes, given that education cannot be attained without an intervention (Anderson et al., 2008). The identified instruction methods/practices under discussion include deliberate practice, role-playing, standardised patients and cueing.

Deliberate practice:

The instruction method of deliberate practice has been utilised in selected studies to enable students to achieve their learning outcomes. McDermott et al. (2017) applied it to sophomore nursing students. It allowed the faculty to prepare the learners for the foundations of respiratory knowledge. Guimond et al. (2019) designed a scaffolding obstetric simulation experience to enable their learners to meet the educational outcomes. They found it helpful in improving obstetric self-efficacy. Gore and Thomson (2016) also found it helpful in developing and sustaining emergency skills, such as cardiopulmonary resuscitation, among undergraduate nursing students. It has also been used as a method of choice to prepare final-year nurse students to transition to the registered nurse role (Liaw et al., 2014).

Role-playing

Several pieces of literature show that students are the usual participants in role-plays. They role-play the learning experiences (Harder, Ross and Paul, 2013; Cant and Cooper, 2014; Aebersold, 2018; Verkuyl et al., 2020; Davies et al., 2021) to optimise their learning (Harder, Ross and Paul, 2013). The role-plays are further valued for their ability to promote the development of critical thinking skills (Lafond and Van Hulle Vincent, 2013). Furthermore, combining techniques, including role-play, props and contextualising nursing activities, promotes immersive clinical learning among nursing students (Davies et al., 2021). Another finding that signifies the importance of role-playing has been reported by Davis et al. (2018); they concluded that “simulation with role-playing is a best practice to promote teamwork, collaboration, and patient-centred care competencies” (p. 56). However, students suffer distress when assigned unfamiliar or non-nursing roles (Harder et al., 2013).

Standardised patients (SPs):

Three (3) studies in this scoping review reported that using standardised patients enables students to achieve learning outcomes effectively (Oh, Jeon and Koh, 2015; Williams et al., 2017; Piot et al., 2021). Oh, Jeon and Koh (2015), in their meta-analysis study, reported that using SPs supports and is beneficial in educating nursing students across the learning domains (cognitive, psychomotor and affective) to achieve various competencies. The associated competencies within the cognitive and psychomotor domain include communication skills, considerable technical skills in nursing and midwifery education

(catheterisation, medicating patients, postpartum haemorrhage, pain management, health assessment skills) and psychiatric disorders. Regarding the affective domain, SPs enable the demonstration of affective mood disorders (Oh, Jeon and Koh, 2015; Piot et al., 2021).

Cueing:

Cues enable educators to progress learners toward achieving their simulation experience objectives (Franklin et al., 2013; Paige and Morin, 2013; Kostovich et al., 2020) by guiding their performance on the appropriate interventions (White, 2017). Furthermore, Paige and Morin (2013), who conducted a systematic review study in search of the meaning of cueing in simulation-based education, revealed two purposes. They reported that it is an instruction method that facilitators use to support students' learning during the scenario (conceptual cueing). Secondly, it assists learners in gaining insight into simulated reality (reality cueing) (Paige and Morin, 2013). Cueing is also called “triggers, prompts, hints and instructional support” aids (Paige and Morin, 2013, p. e485).

The commonly reported conceptual cues include questions or trigger statements asked when the student is stuck (White, 2017; Kostovich et al., 2020). In comparison, the reality cues are changes exhibited by the simulator, designed to trigger a further exploration of the presented situation (Franklin et al., 2013; Paige and Morin, 2013; White, 2017; Kostovich et al., 2020). The reality cues could be embedded into the environment or equipment, such as a sudden drop in vital signs when a learner delay initiating an intervention (Paige and Morin, 2013; White, 2017).

4.9.2.3 Category 3: Student Roles and Responsibilities

As simulation learning participants, students are assigned roles to achieve their outcomes. This practice has been part of simulation learning as, in most studies, the students are either informed or given roles to undertake during the simulation experience (Jeffries, 2005a; Harder, Ross and Paul, 2013; Wheeler and McNelis, 2014; McDermott, 2016, 2020; Tyerman et al., 2016; Gordon, 2017; Brennan, 2022). It is worth noting that the role assignment is consistently done during the pre-briefing phase (the time before the students participate in the simulation scenario) (Harder et al., 2013; McDermott, 2016, 2020; Tyerman et al., 2016; Brennan, 2022).

Types of student roles:

During the pre-briefing phase, students must complete the preparatory content/activities prerequisite to the simulation experience (McDermott, 2016; Herlihy and Teel, 2020). McDermott (2016) further alluded that the students are responsible for taking charge of their learning, respecting the simulation learning environment and maintaining the contractual agreement of confidentiality about the content of the simulation experience.

During the scenario phase, students could be assigned roles to perform the registered nurse duties, portraying patient illness, the observer role, and conducting a peer evaluation assessment (Jeffries, 2005a; Harder et al., 2013; Liaw et al., 2014; Shaw-Battista et al., 2015; Aebersold, 2018; Guimond et al., 2019; Reibel, Cason and Screws, 2019; Davies et al., 2020).

During the debriefing phase, student roles include “reflecting on the learning experience, sharing comments with peers, discussing goals and strategies for improvement, reflecting on personal abilities, beliefs and values and discussing the transition of the acquired knowledge, skills and attitude to clinical practice” (Gordon, 2017, p. 672).

4.9.2.4 Category 4: Student Competencies

Students achieve numerous competencies through simulation-based education. These include critical thinking skills, clinical skills, assessment skills, communication skills, reflective thinking skills, collaborative practice, professionalism and ethical practice, self-efficacy, confidence, management and leadership skills (Harder et al., 2013; Hayden et al., 2014; Oh, Jeon and Koh, 2015; Aebersold, 2018; Reibel et al., 2019; Guimond et al., 2019; Bryant et al., 2020; Davies et al., 2020; Kiernan and Olsen, 2020; McDermott, 2020; Brennan, 2022).

4.9.3 Code 3: Designing Simulations

This code focuses on the elements and processes essential to designing simulation-based education. It has five (5) categories: pre-briefing, simulation scenario, fidelity, debriefing and evaluation.

4.9.3.1 Category 1: Pre-briefing

Pre-briefing refers to the activities undertaken before the simulation scenario (INACSL Standards Committee, McDermott et al., 2021). It is considered the initial step in designing simulations (INACSL Standards Committee, 2016b; McDermott, 2016, 2020; Tyerman et al., 2016; INACSL Standards Committee, McDermott et al., 2021; Ludlow, 2021; Brennan, 2022). Approximately 25% (n=15) of studies in this scoping review incorporated pre-briefing when designing their simulation-based learning experience; examples include Shaw-Battista et al. (2015); Tyerman et al. (2016); Gordon (2017); McDermott et al. (2017); Brown et al. (2019); Guimond et al. (2019); Reibel et al. (2019); Grota et al. (2020); and Dale-Tam et al. (2021).

There are various benefits of pre-briefing discovered through this scoping review. (a) It serves as a mechanism that facilitates students' success when engaged in a simulation experience (McDermott, 2016; Rutherford-Hemming et al., 2019). Others have prioritised it for (b) establishing psychological safety (Rudolph et al., 2014; Shaw-Battista et al., 2015; Rutherford-Hemming et al., 2019; DaleTam et al., 2021); (c) enhancing self-efficacy (p=.001) and (d) clinical competency (P=<.001) (Brennan, 2022). It is also presumed effective in (e) ensuring a successful debriefing and reflection session (McDermott, 2016; Rutherford-Hemming et al., 2019).

There are elements to consider when implementing the pre-briefing practice. According to the INACSL Standards Committee et al. (2021), pre-briefing involves preparation and briefing. The preparation phase focuses on the various preparatory activities the learners should complete in the classroom (McDermott et al., 2017; Tyerman et al., 2019; INACSL Standards Committee, McDermott et al., 2021). These preparation activities should be scheduled and completed before the simulation learning experience (Herlihy and Teel, 2020; McDermott, 2020; INACSL Standards Committee, McDermott et al., 2021; Ludlow, 2021).

Aspects of the briefing are well described in the literature, although to others, they are conceptualised as essential elements of pre-briefing (Rutherford-Hemming et al., 2019).

They include setting the stage; facilitator and students' expectations; purpose, method and process of debriefing; simulation scenario backstory, objectives, roles and evaluation; orientation to the simulation room and equipment; and preparation time (McDermott, 2016, 2020; Rutherford-Hemming et al., 2019; Herlihy and Teel, 2020; Kostovich et al., 2020; INACSL Standards Committee, McDermott et al., 2021; Ludlow, 2021).

Pre-briefing guidelines:

The literature articulates the criteria for meeting the application process of the pre-briefing preparation phase. The INACSL Standards Committee et al. (2021) stated that (a) the prebriefing process should be conducted by a simulation educator who is well-informed about the scenario, competent in the pre-briefing concept, engages in continuing education and follows the Healthcare Simulation Standards of Best Practice (HSSOBP). (b) A need assessment and the simulation experience objective should inform the preparation materials. (c) The planned preparation content should match the student's academic level, and (d) align with the simulation experience's purpose or objective. Lastly, (e) the administration of the preparation materials should be scheduled before the occurrence of the simulation scenario (Herlihy and Teel, 2020b; McDermott, 2020; INACSL Standards Committee, McDermott et al., 2021; Ludlow, 2021).

4.9.3.2 Category 2: Simulation Scenarios

The simulation scenario was identified in most of the included studies (Arthur et al., 2013; Liaw et al., 2014; Alexander et al., 2015; Shaw-Battista et al., 2015; McDermott, 2016, 2020; McDermott et al., 2017; Aebersold, 2018; Gore et al., 2018; Reibel, Cason and Screws, 2019; Guimond et al., 2019; Davies et al., 2020; Herlihy and Teel, 2020; Kostovich et al., 2020; INACSL (Standards Committee, McDermott, et al., 2021; Herlihy, 2022). These findings signify that the element scenario is core when designing simulations.

The simulation scenario is described as a structured teaching-learning resource that presents a patient's condition, according to Hayden et al. (2014), encountered in clinical practice (Davies et al., 2020). Therefore, the scenario involves creating a backstory (client situation) (Shaw-Battista et al., 2015; Aebersold, 2018; Rutherford-Hemming et al., 2019;

Bryant et al., 2020). The backstory should include the patient's demographic information, history of illness, medications and other related data (Aebersold, 2018).
Capturing the patient's details is vital. Bryant et al. (2020) emphasised that the simulation scenario should contain the patients' needs to ensure their (patient) safety.

The scenario should be informed by a needs assessment linked to the course objectives and the student's educational level (Alexander at al., et al., 2015; Shaw-Battista et al., 2015; Reibel et al., 2019). Aside from that, it is vital to link a scenario to the didactic course content related to clinical skills (Shaw-Battista et al., 2015; Reibel et al., 2019) and adhere to the International Nursing Association for Clinical Simulation and Learning (INACSL) simulation design best practices (Hayden et al., 2014; Reibel et al., 2019). Most nursing education institutions create their scenarios (Hayden et al., 2014; Guimond et al., 2019; Reibel et al., 2019) or use their institution's template to modify purchased scenarios (White, 2017). The purchased scenarios include those pre-packaged by the mannequin vendors (Hayden et al., 2014). Moreover, creating a simulation scenario requires a collaborative effort. It should include the course lecturer, educators, clinical researchers, and simulation experts (Hayden et al., 2014; Shaw-Battista et al., 2015; Reibel et al., 2019; Bryant et al., 2020).

Variables of importance that should be incorporated when designing a scenario identified in this scoping review included selecting an appropriate fidelity mannequin, standardised patients, role-playing, setting up the skills station and clear learning objectives (Hayden et al., 2014; Shaw-Battista et al., 2015; Guimond et al., 2019; Davies et al., 2020). The simulation scenario should include cues, time frames and an indication of critical performance measurements (Lioce et al., 2015). Other essential elements are that the scenario should be scripted or presented in a template to maintain consistency (Liaw et al., 2014; Shaw-Battista et al., 2015; White, 2017; Aebersold, 2018) and should incorporate the aspect of problem-solving (Hayden et al., 2014).

4.9.3.3 Category 3: Fidelity

Fidelity in simulation refers to the degree of realism of the simulation experience (Aebersold, 2018; Shaw-Battista et al., 2015; Meakim et al., 2013; Lioce et al., 2015). It reflects the extent to which the simulated learning experience incites perceptual, psychological factors and

conceptual processes (Meakim et al., 2013; Paige and Morin, 2013; Lioce al., 2015; Shaw-Battista et al., 2015). In Jeffries, Dreifuerst, Kardong-edgren et al. (2015), McFaden (2020), Bryant et al. (2020) and Aebersold (2018), fidelity is the design element that necessitates the creation of the desired level of realism in a simulation scenario.

There are various measurements of fidelity; they include the equipment or types of mannequins and environmental, psychological and conceptual realism (Arthur, Levett-Jones and Kable, 2013; Liaw et al., 2014; Brady et al., 2015; Lioce et al., 2015; Shaw-Battista et al., 2015; Aebersold, 2018; Reid et al., 2020). Physical fidelity comprises the equipment/type of mannequin and the environment, including the layout, patient bed sizes, and smells that mimic the hospital setting (Paige and Morin, 2013). In comparison, psychological fidelity involves intangible aspects of realism, such as emotions triggered by the believability of the experience (Paige and Morin, 2013). Conceptual fidelity is achieved when the learners interpret the simulated situation as intended (Paige and Morin, 2013). It can be enhanced by ensuring course experts preview and pilot the scenario before implementing it with the intended students (Lioce et al., 2015). Another way of enhancing this fidelity is through props/cues (Paige and Morin, 2013; Shaw-Battista et al., 2015; Franklin et al., 2020).

The measurements of fidelity can be evaluated or graded as either low, medium or high (Arthur et al., 2013; Paige and Morin, 2013; Hayden et al., 2014; Brady et al., 2015; Williams et al., 2017; Zitzelsberger et al., 2017; Hall et al., 2017; McDermott et al., 2017; van Vuuren et al., 2018; Guimond et al., 2019; Reibel et al., 2019; Moabi and Mtshali, 2021). In their systematic review study, Paige and Morin (2013) referred to them as the fidelity dimensions.

High-fidelity simulation dimension:

High fidelity was used in fourteen (14) studies when designing simulation experiences. Among those, eight (8) studies support that high fidelity is more effective than the other types. It enables the replication of multiple patient conditions and enhances the acquisition of various competencies for undergraduate nursing students (Harder et al., 2013; Hayden et al., 2014; Williams et al., 2017; Zitzelsberger et al., 2017; Gore et al., 2018; McFaden, 2020). The competencies include clinical judgement (Reid et al., 2020), development of communication and technical skills, empathy and confidence in mental health students

through standardised patients (Hall et al., 2017). With this fidelity dimension, students can conduct health assessments and carry out interventions such as administering treatment (Grota et al., 2020). Aside from achieving the required outcomes, supporting evidence demonstrates that with high-fidelity dimensions, it is possible to replace traditional clinical hours entirely or partially across undergraduate nursing courses (Hayden et al., 2014; Grota et al., 2020; Reid et al., 2020).

Paige and Morin's (2013) work showed that fidelity simulation dimensions consist of tangible and abstract materials: equipment, environment, and psychological and perceptual realism. High-fidelity equipment includes computerised mannequins that mimic physiological features such as breathing, lung sounds, chest movements, pupillary reflex, coughs, and vomiting and can interact with students (Liaw et al., 2014; McDermott et al., 2017; Aebersold, 2018; Guimond et al., 2019). An example of physical environmental fidelity is that the simulation learning space should resemble a real-life patient room (Paige and Morin, 2013; Lioce et al., 2015; McDermott et al., 2017). For example, it may include a human-size mannequin, hospital bed, vital sign equipment, patient files, bed, linen and floor soiled with urine, and other multidisciplinary staff, nursing staff and students in uniforms (Arthur et al., 2013; McDermott et al., 2017). The equipment and environment should, in turn, trigger a psychological perception of realism, as the two should create an impression that could be felt in a real-life setting (Lioce et al., 2015). Another example of high-fidelity elements is standardised patients or live human actors (Brady et al., 2015; Hall and Tori, 2017; Aebersold, 2018).

Medium fidelity simulation dimension:

Types of simulation equipment designed to evoke medium fidelity realism include a computerised mannequin that can reproduce human physiological features except for specialised features such as pupillary reflexes and chest movement, among others; they include task trainers for practising catheter and intravenous insertion skills (Aebersold, 2018). In Brady et al. (2015), a medium fidelity was created using a human-sized poster of a pregnant woman positioned on a partial task trainer. A monitor was used to play the patient's voice behind a screen to train students' communication skills. The created fidelity

dimension elicited psychological realism and was valued equally to the high-fidelity experience involving an actual patient. It allowed the students to acquire midwifery skills (Brady et al., 2015).

Low fidelity simulation dimension:

Low-fidelity simulators are usually partial task trainers or torsos relevant to the performed skill (Brady et al., 2015). Role-plays in mental health nursing are also categorised at this fidelity level (Hall and Tori, 2017). They are associated with developing psychomotor and assessment skills (Grota et al., 2020).

4.9.3.4 Category 4: Debriefing

Debriefing is considered a vital element of the simulation-based educational approach (Decker et al., 2013; Jeffries et al., 2015; Sawyer et al., 2016; Hall and Tori, 2017; Herlihy and Teel, 2020; Kostovich et al., 2020; Dale-Tam et al., 2021). It is the stage where students' learning takes place under the guidance of an experienced/trained clinical facilitator(s) (Decker et al., 2013; Jeffries et al., 2015; INACSL Standards Committee, 2016d; Davis et al., 2018; Reibel et al., 2019; Dale-Tam et al., 2021). It is reported that through debriefing, students can transfer appropriate knowledge, skills, and attitudes inherent to quality patient care and safety (Decker et al., 2013). Hence, it is linked with the capacity to close the gap between theory and practice (INACSL Standards Committee, 2016d; Rudolph et al., 2016).

Several studies in this scoping review reported on best practices of the debriefing process. They include the types of debriefing frameworks, facilitation conductors and timing.

Debriefing frameworks

Using standardised frameworks to guide the debriefing session received sizeable attention in the literature (Decker et al., 2013; Alexander et al., 2015; Beroz, 2017; Hall and Tori, 2017). Among the included studies, debriefing frameworks were identified and utilised in fourteen (14) studies. Importantly, Dale-Tam et al. (2021) alluded that frameworks assist in delivering effective debriefing even when used by novice facilitators.

The debriefing frameworks include (a) the Promoting Excellence and Reflective Learning in

Simulation framework (PEARLS) (Sawyer et al., 2016; McDermott et al., 2017; Guimond et al., 2019; Reibel et al., 2019; Grota et al., 2020; Dale-Tam, Menard and Posner, 2021). The PEARLS debriefing technique offers a student an individualised reflective learning opportunity after the simulation performance. The student is asked directive questions such as “How did it go?” (Reibel et al., 2019, p:299). The components of this framework include reaction, description, analysis, and summary. It provides the educator with a structured tool for guiding.

(b) Debriefing for Meaningful Learning (DML), established by Dreifuerst in 2010, identified by Hayden et al. (2014); Jeffries, Dreifuerst, Kardong-edgren et al. (2015); Sawyer et al. (2016); Gordon (2017); Hall and Tori (2017); and McDermott et al., (2017). The DML is said to be effective in promoting the development of clinical reasoning (Hall and Tori, 2017) and understanding clinical competencies (Hayden et al., 2014). Furthermore, the “goal of DML is to teach students to be reflective and to think like nurses while developing clinical-reasoning skills” (Jeffries et al., 2015, p:21). (c) 3D model: defusing, discovering, and deepening; this is another framework for guiding students in the reflection process (Sawyer et al., 2016; Hall and Tori, 2017; Verkuyl et al., 2020).

Other debriefing frameworks include the GAS (gather, analyse, and summarise), Diamond Debrief (description, analysis and application), Debriefing with Good Judgement (reaction, analysis and summary), and Plus/Delta (INACSL Standards Committee, 2016b; Sawyer et al., 2016). Also included are frameworks with multiple steps: TeamGains with six sequential steps (reaction, discuss clinical component, transfer from simulation to reality, discuss behavioural skills, summary and supervised practice of clinical skills) and the healthcare simulation After Action Review (AAR) (define rules; explain learning objectives; benchmark performance; review expected reactions; identity what happened; examine why things happened the way they did and formalise learning) (Sawyer et al., 2016).

Debriefing facilitation conductors

The literature provided information on who can conduct the debriefing session. Sawyer et al. (2016) described this element as conversational facilitation, a guide that should be used to get the students to share their mental processes. Also highlighted are the debriefing facilitation adjuncts, strategies which can aid in the delivery process.

Three (3) studies focused on those who can use the frameworks mentioned above to guide the debriefing process, while the majority specified who debriefed the participants in their research work. The debriefers are the facilitators/educators/lecturers or the learners/students participating in the simulation learning experience. If the facilitator conducts the debriefing, it is called facilitator-guided, and if by the student, it is termed self-guided (Sawyer et al., 2016; Hall and Tori, 2017; Verkuyl et al., 2020).

Thirteen (13) of the included studies informed about the attributes of the facilitator(s). Eleven (11) of those reported that a trained/prepared/experienced facilitator should conduct a debriefing (Arthur et al., 2013; Decker et al., 2013; Hayden et al., 2014; Alexander et al., 2015; Shaw-Battista et al., 2015; McDermott, 2016; Sawyer et al., 2016; Beroz, 2017; Gordon, 2017; Hall et al., 2017; McDermott et al., 2017). The facilitators should ensure that student objectives and outcomes are linked with the simulation learning experience and adjusted to the student's academic level (Decker et al., 2013). Furthermore, the debriefer should be someone who observed the simulation scenario experience (Decker et al., 2013; Hall and Tori, 2017; Bryant et al., 2020; Verkuyl et al., 2020). On the other hand, Sawyer et al. (2016) provided techniques for leading the debriefing session. They include learner-self assessment in which the students are asked open-ended questions, silence, advocacy inquiry, directive feedback, guided-team self-correction approach and circular questions to facilitate the debriefing process (Sawyer et al., 2016).

Verkuyl et al. (2022) stated that the self-guided debriefing method is suitable for virtual simulation-based learning. Regarding virtual simulation, students debrief using Socratic questions linked to an existing debriefing framework to reflect on their learning experience (Verkuyl et al., 2022). Furthermore, the self-guided debriefing could be as effective as the facilitator-guided approach, particularly for learning behavioural skills (Sawyer et al., 2016). On the other hand, debriefing facilitation can be conducted remotely, known as multimedia or teledebriefing (Brown et al., 2018). Telebriefing is ideal for simulation programmes with distance education students or those in rural settings (Brown et al., 2018).

Adjunct debriefing methods have been identified in the studies. Examples include code briefing, video-assisted debriefing, and debriefing scripts (Shaw-Battista et al., 2015; Sawyer et al., 2016; Hall and Tori, 2017; Brown et al., 2018).

Debriefing timing

Timing is another deliberated element of the debriefing process in the literature. It is essential to inform when debriefing can occur during the simulation scenario. According to Sawyer et al. (2016), it occurs in two stages: within-event (micro-debriefs during the scenario) and post-event (immediately after the simulation scenario experience). Notably, in most of the included studies, it was considered a post-event activity (Arthur et al., 2013; Shaw-Battista et al., 2015; Gore and Thomson, 2016; Gordon, 2017; Hall and Tori, 2017; Brown et al., 2018; Guimond et al., 2019; Verkuyl et al., 2020; Dale-Tam et al., 2021).

4.9.3.5 Category 5: Evaluation

Simulation is an effective didactic instruction method that enables students to learn, practice and develop technical, non-technical and technological competencies (Sando et al., 2013; INACSL Standards Committee, 2016b). The scope of what should be evaluated in simulation learning is broad. Four studies concluded that it should consist of evaluating student performance, the facilitator's/simulation staff competencies and the quality of the simulation scenario/learning experience (Beroz, 2017; Zitzelsberger et al., 2017; Bryant et al., 2020; Grota et al., 2020; Piot et al., 2021). In addition, types of simulation evaluation, tools/methods for providing feedback to students and those for measuring the quality of the simulation learning experience were identified in this scoping review.

The reported types of simulation learning evaluation are formative, summative and high-stakes evaluation (Sando et al., 2013; Liaw et al., 2014; INACSL Standards Committee, 2016b; Rutherford-Hemming, Lioce and Breymier, 2019) and remedial evaluation (Zitzelsberger et al., 2017). Each of these evaluation types has its specific objective. A formative evaluation is conducted to develop and prepare the students to achieve their course objectives (Sando et al., 2013; INACSL Standards Committee, 2016b). They further revealed that summative focuses on evaluating the achievement of the course outcomes, usually at the end of the programme. At the same time, high stakes are graded for merit awards and determine whether the participant’s performance could lead to certification (Sando et al., 2013; INACSL Standards Committee, 2016a).

The highlighted evaluation types require tools to provide feedback and determine a student's competence in the given skills. The instruments must be valid and reliable (Boese et al., 2013; Jeffries et al., 2015; Beroz, 2017). The evaluation of student performance in simulation research is determined through pre-test and post-test initiatives (Liaw et al., 2014; Davis et al., 2018; Guimond et al., 2019; Reid et al., 2020; Piot et al., 2021).

Among the included studies, one valid and reliable simulation evaluation instrument is the Creighton Competency Evaluation Instrument (CCEI) (Hayden et al., 2014; Jeffries et al., 2015; McDermott et al., 2017; Brennan, 2022). The CCEI is used to evaluate learners' performance and clinical competency, and it has an inter-rater reliability Cronbach alpha score of (>0.90) and content validity score of (3.78 to 3.89) tested by Hayden, Keegan et al. (2014). The CCEI instrument core content includes patient assessment, communication skills, clinical judgement and patient safety (Hayden, Keegan et al., 2014).

This scoping review revealed valid and reliable tools for evaluating nursing and midwifery undergraduate student competencies during simulation learning. One of those is the Lasater Clinical Judgment Rubric (LCJR) for promoting and assessing student clinical judgement, developed by Lasater in 2007. It was used in three (3) studies of this review (Hall and Tori, 2017; Reibel et al., 2019; Reid et al., 2020). It has an interrater reliability of 0.97 (Hall and Tori, 2017). Also reported is the framework that evaluates the Quality and Safety Education for Nurses (QSEN) competencies: teamwork, collaboration and patient-centred care (Davis et al., 2018; Reibel et al., 2019). Guimond et al. (2019) measured the performance of midwifery students using an Obstetric Nursing Self-Efficacy (ONSE) tool. The ONSE-instrument allows the learners to self-evaluate their capability in conducting an assessment, intervention and communication competencies. It has a split-half reliability score of 0.85, 0.96, and 0.92, respectively (Guimond, Foreman and Werb, 2019).

Another essential instrument is the one used by Liaw et al. (2014) to determine the readiness of final-year nursing students for clinical practice in five competencies. They used the Preparedness for Hospital Practice Questionnaire (PHPQ) instrument that evaluates self-directed learning, confidence, management, collaboration and interprofessional skills. The tool had a Cronbach Alpha of 0.83 to 0.94 in each item (Liaw et al., 2014).

Aside from measuring student performance, the facilitators are also evaluated, particularly the debriefing competence (Jeffries, Dreifuerst, Kardong-edgren et al., 2015; Beroz, 2017). Assessing the facilitators' competency in debriefing is one way of measuring the quality of the simulation learning experience (Jeffries, Dreifuerst, Kardong-edgren et al., 2015).

Different tools are used to evaluate the quality of a simulation experience, and they have been reported in seven (7) studies in this scoping review. The Debriefing Assessment for Simulation in Healthcare-Rater Version (DASH© -RV) is a standard evaluation instrument for evaluating facilitators' debriefing skills, utilising a peer-to-peer assessment mode (Jeffries, Dreifuerst, Kardong-edgren et al., 2015). A student version of the same tool was reported in two (2) of the included studies. It is given to students to assess the quality of the debriefing they underwent during the simulation experience. It is called the Simulation in Healthcare Student Version© (DASH-SV) instrument (Brown et al., 2018; McDermott, 2020). Brown et al. (2018) conducted a psychometric test on the DASH-SV questionnaire with an internal validity score of alpha=0.95. In addition, one study reported an additional tool for determining debriefing quality: an Observational Structured Assessment of Debriefing (OSAD) instrument. It was used by Dale-Tam et al. (2021) to measure the debriefing quality among nurse educators who underwent simulation champions training.

McDermott et al. (2017) used a Simulation Perspective Survey (SPS) tool with a Cronbach alpha of (0.83). The students give feedback about the simulation quality after completing the learning experience (McDermott et al.2017). Similar to the latter is a tool developed and used by Beroz (2017) called the Program Assessment Survey for Simulation (PASS). It helped to identify irregularities within their simulation programme practices (Beroz, 2017). Another who evaluated a simulation programme is Liaw et al. (2014). They formulated their evaluation tool using the Kirkpatrick model. Lastly, the Simulation Design Scale is another instrument of great value in simulation learning; it measures the design characteristics regarding whether the scenario fidelity reproduces real-life experience (Paige and Morin, 2013).

Evaluation preparation guidelines:

The literature highlighted a set of guidelines that directs simulation evaluation. They include (a) establishing the type of evaluation method (formative, summative, high stakes) before engaging the student in the simulation experience (Sando et al., 2013; Hayden et al., 2014; Liaw et al., 2014; Rudolph et al., 2014; INACSL Standards Committee, 2016a; Reibel et al., 2019; INACSL Standards Committee, McMahon et al., 2021). The highlighted practice relieves the participants from the stress of participating in the simulation learning experience (Rudolph, Raemer and Simon, 2014). (b) Indicating the timing of the evaluation (INACSL Standards Committee, McMahon et al., 2021). (c) Using validated and reliable evaluation instruments; (d) ensuring that evaluators are trained (Sando et al., 2013; Hayden et al., 2014; Jeffries, Dreifuerst, Kardong-Edgren et al., 2015; INACSL Standards Committee, McMahon et al., 2021) and (e) providing feedback to the participants (INACSL Standards Committee, McMahon et al., 2021).

4.9.4 Code 4: Innovations in Simulation

The rapid diffusion of simulation culture within nursing/healthcare education is evident in the literature, according to Aebersold (2018), and innovations are being discussed (Bryant et al., 2020). Innovations identified in this scoping review include information about the INACSL standards, teaching strategies and virtual simulation.

4.9.4.1 Category 1: INACSL standards

The INACSL, International Nursing Association for Clinical Simulation and Learning, is a recognised board that provides resources to simulation faculty and the National League for Nursing's Simulation Innovation Centre (SIRC) (Hayden et al., 2014). The INACSL Standards Committee provide standardised tools for guiding simulation use so that implementers maintain the same practices (McDermott et al., 2017). Simulation experts emphasised that it is imperative to adopt the INACSL standards of best practice as they are evidence-based guidelines and help in closing the gaps regarding understanding the simulation pedagogy (Franklin et al., 2015; Beroz, 2017; White, 2017; Tyerman et al., 2019; Bryant et al., 2020).

The incorporation and recognition of the INASCL standards were noted in most of the included studies (Arthur et al., 2013; Hayden et al., 2014; Alexander et al., 2015; Gore and Thomson, 2016; Guimond, Foreman and Werb, 2019; Reibel et al., 2019; Ludlow, 2021), to name a few. While some focused on explaining how nurse educators/facilitators can successfully use INACSL standards to guide the simulation-based education process (Beroz, 2017; McDermott, Sarasnick and Timcheck, 2017; White, 2017; Grota et al., 2020), Grota et al. (2020) stated that it enables simulation nurse educators to integrate excellent practices into simulation programmes, thus ensuring the delivery of high-quality learning experiences.

The available INACSL best practice standards include (a) related terms, labelled simulation standard I: Terminology, to internationalise the language and ensure consistency in practice, education and research (INACSL Standards Committee, 2016). (b) There is a standard that addresses the formulation of simulation objectives and outcomes (Lioce et al., 2013; INACSL Standards Committee, 2016a); (c) simulation design (Lioce et al., 2015; INACSL Standards Committee, 2016c). In addition, (d) simulation facilitation, standard IV (Franklin et al., 2013); (e) participant evaluation (Sando et al., 2013); (f) prebriefing process (INACSL Standards Committee, McDermott, Ludlow et al., 2021); (g) debriefing process: standard VI (The INASCL Board of Directors, 2011; Decker et al., 2013).

4.9.4.2 Category 2: Innovative Teaching Strategies

The literature highlighted innovative teaching strategies to better prepare students for professional practice roles within simulation learning. They include escape room exercises and extended immersive simulation (Davies et al., 2020; Parker and Welch, 2021). The escape room exercise is a game-learning strategy embedded in the simulation experience and is crucial to alleviating anxiety (Parker and Welch, 2021). Furthermore, this educational instruction enables learners to receive instant feedback and achieve various competencies, including collaboration, communication, time management, delegation, leadership, and clinical reasoning (Parker and Welch, 2021).

The extended immersive simulation is a comprehensive experience intended to prepare and equip final-year nursing students with real-life technical and non-technical skills for

registered nurses (Davies et al., 2020). It incorporates a hospital-based setting and its operational features: patients with different conditions, clinical practice multidisciplinary teams, and essential departments such as the pharmacy and laboratory. In addition, students are assigned registered nurses' roles across the standard hospital shifts (morning, afternoon and evening) (Davies et al., 2020).

4.9.4.3. Category 3: Virtual Simulation

Virtual simulation is considered one of the simulation teaching methods (Williams et al., 2017; Aebersold, 2018; Piot et al., 2021). Williams et al. (2017) further reported on the benefits of virtual simulation, stating that virtual simulated patients effectively teach reasoning skills and are most appropriate for distance learners. Among the included studies, only two (2) were centred on virtual simulation, focusing on the debriefing element (Gordon, 2017; Verkuyl et al., 2020). Verkuyl et al. (2020) explored the effectiveness of virtual debriefing practices: self-debrief, small-group debriefing post-self-debrief, and large-group debriefing alike. They concluded that there is optimal learning in combining self-debrief with group debriefing immediately after the experience (Verkuyl et al., 2020). In comparison, Gordon (2017) shared how to debrief following virtual simulation learning. In this learning environment, self-debriefing is employed, and the students are given questions to guide the reflection session (Gordon, 2017).

4.10 DISCUSSION OF SCOPING REVIEW FINDINGS

The scoping review provided answers on available best practices of simulation-based education that could be useful in the educational preparation of undergraduate nursing students locally (Sub-Saharan Africa) and internationally. This section discusses the scoping review findings.

4.10.1 Lecturer Preparation

The results of this study revealed that lecturer preparation or training in simulation pedagogies is vital for the integration and sustainability of a simulation-based education programme. The lack of trained faculty in SBE was cited as a barrier for many nursing education institutions to embrace the simulation pedagogy (Adamson, 2010). This concern

was reported by Swart et al. (2019) in their study that explored the state of simulation use in South Africa. Unlike in Tanzania, educators had the required simulation knowledge and skills and a new simulation centre; however, they were not integrating SBE into their undergraduate nursing programme due to an overloaded timetable and curriculum (Tjoflåt and Våga, 2017).

Without training, the faculty tends to provide a substandard simulation learning experience, resulting in the under-preparedness of learners (Dale-Tam et al., 2021). A statement from Waxman and Telles (2009) explains the underlying cause of this behaviour. They stated that lecturers might be experts in their specialities “but become a novice in simulation pedagogy” (Waxman and Telles, 2009, p.e231). Hence, Shellenbarger and Edwards (2012) emphasised the necessity for training student nurse educators on simulation-based education to prepare them for their clinical nursing teaching role. It is worth noting that the nurse educators' clinical teaching competency has received attention, given the trending evidence that qualified nursing students feel underprepared to handle nursing roles upon employment (Leighton et al., 2022).

Beroz (2017) argues that simulation can be realised as a teaching-learning methodology rather than a technology through formal training. Formal and informal simulation education training opportunities are accessible to faculty, including self-training, in-service training, simulator retailers, conferences, online modules and peer-to-peer training, journals, clubs and webinars (Shellenbarger and Edwards, 2012). Moreover, some simulation faculty are formally trained and certified as Certified Healthcare Simulation Educators (CHSE) (McDermott, 2016). Such training remains fundamental for nurse educators, given the variety of roles and responsibilities inherent to their faculty positions throughout the phases of SBE. In line with these scoping review findings regarding the roles of lecturers in simulation is Nestel et al. (2017), who concluded that these staff members are the ones responsible for supporting, guiding and structuring student learning experiences.

4.10.2 Student Elements

This study showed that learning outcomes could be achieved if the students were prepared to learn through simulation. Solli et al. (2020) also reached a similar conclusion and stated

that students' preparation improves the effect of learning. Both students and lecturers consider it mandatory (Motola et al., 2013). However, preparing students remains the facilitator's role in simulation learning (Solli et al., 2020). Instruction methods/practices that could be utilised to enable students to achieve the intended simulation learning outcomes were identified in his study. They included (a) deliberate practice, (b) role-playing, (c) standardised patients (SPs) and (d) cueing. Anderson et al. (2008) referred to such instruction methods/practice interventions to enable students to reach the desired clinical competencies.

4.10.3 Designing Simulations

Designing simulations entails pre-briefing, simulation scenarios, fidelity, debriefing and evaluation. Some of these elements have been prioritised in other research works, including Sittner et al. (2015); Leigh and Steuben (2018); Morse et al. (2019); Solli et al. (2020); and Brohard et al. (2021). Each of these elements is discussed below:

Pre-briefing:

Pre-briefing components or processes were unclear compared to other identified simulation design elements. However, recently, the INACSL, an organisation long committed to developing simulation standards for international use, conceptualised and incorporated them in the Healthcare Simulation Standard of Best Practices. Pre-briefing is considered a core element of simulation design with two aspects: preparation and briefing. These concepts had always co-existed with the element of pre-briefing. However, there were varied applications. For example, Solli et al. (2020) proposed separating the elements in their study. The briefing aspect was considered the principal element of simulation-based learning.
While ‘preparation’, which they termed presimulation preparation and pre-briefing, together were said to precede the aspect of briefing (Solli et al., 2020). On the other hand, Leigh and Steuben (2018) used pre-briefing interchangeably with briefing but recognised that it comprises preparation activities. However, Morse et al. (2019) views were consistent with the conclusions drawn in this scoping review.

The information about the timing and the purpose of pre-briefing was consistent in most literature. Most evidence concurs that it occurs before the start of the simulation learning

experience and is meant to prepare the learners for what they will encounter during the simulation experience (Groom et al., 2014; Leigh and Steuben, 2018; Morse, Kardong-Edgren and Barlow, 2019). Furthermore, it is necessary to ensure that students achieve their learning objectives (Distelhorst and Wyss, 2013).

Simulation scenario:

The simulation scenario is the backbone of simulation learning because it is the medium that provides the teaching and learning experience undertaken to achieve the course outcomes. As such, Waxman (2010) submitted that the simulation scenario should be based on a needs assessment to enable educators to design a need-oriented learning experience. Van Wyk et al. (2020) stated that the simulation scenario should be created with competencies in mind that shall be listed as objectives. Additionally, the scenario objectives should be shared with the students before the simulation experience (Kardong-Edgren and Adamson, 2009; Lioce et al., 2013). Further considerations for scenario development include ensuring that the scenario matches the student's academic level. Waxman and Telles (2009) suggested using Benner's Novice to Expert Theory as a model for aligning the complexity of the scenario.

Another critical finding about simulation scenario development is that it requires a collaborative team composed of the course lecturer, clinician-researchers, simulationists, and other educators to accomplish the task. In this regard, Waxman (2010) also recommended that scenario development be based on evidence. Moreover, prewritten scenarios are available from mannequin manufacturers or commercial markets, and this option is considered cost-effective and less time-consuming. Several studies, Waxman and Telles (2009); Waxman (2010); Kunst et al. (2017); Bogossian et al. (2018); van Wyk et al. (2020) support the use of purchased simulation scenarios in line with the stated benefits.

Simulation fidelity:

Simulation fidelity has three levels/dimensions: low-fidelity, medium-fidelity, and high-fidelity. The three levels of fidelity are not equally rated: the high-fidelity level is associated with increased student satisfaction and effective achievement of various undergraduate technical and non-technical competencies compared to medium and low fidelity. This study's results

are consistent with those of Kim et al. (2016), whose findings informed that the high and medium fidelity have larger effect sizes (1.03) and (0.86), respectively, while the low fidelity had a smaller effect size =0.35 (Kim et al., 2016). The rationale is that a high-fidelity level provides the highest degree of realism (West et al., 2017). However, it should be noted that not all quality simulation experiences require high-fidelity mannequin equipment. In addition, the lack of high-fidelity equipment and resources should not be a limiting factor in integrating simulation-based education into a nursing programme. The World Health Organisation, when endorsing simulation use in healthcare education, stated that it should be implemented based on available resources (WHO, 2013; Martins et al., 2018).

Debriefing:

Debriefing was well explained in the reviewed studies regardless of whether the simulation experience was offered via physical contact or in a virtual space. The debriefing can be offered at two intervals: within the event (during) or immediately after (after) the simulation experience. However, the immediately after (post) simulation experience remains the standard timing for carrying out the debriefing session; Groom et al. (2014) and Jeffries et al. (2015) support this finding.

Groom et al. (2014) further highlighted that debriefing involves the educator/facilitator and the student/learner. It was discovered in the scoping review that the debriefer could be the nurse educator/facilitator, and the process is referred to as ‘facilitator guided’, and when the learner undertakes it, it is termed ‘self-guided’ debriefing. However, Cheng et al. (2014) reported that most participants prefer the facilitator-led debriefing style. Another reported debriefing mode is group facilitation; the participants (students) found it beneficial in their learning (Fey et al., 2014). Additionally, all the reviewed articles underscored that a trained or experienced provider should facilitate the debriefing process using standardised frameworks.

Simulation Evaluation:

The findings of this scoping review were consistent with other literature that the types of evaluations used for simulation learning include (a) formative, which are intended for examining the learner's progress towards course objectives, (b) summative for determining

the quality of the end of the course achievement, while (c) high-stakes leads to certification (Oermann and Gaberson, 2014; INACSL Standards Committee, Molloy et al., 2021).

This scoping review showed that evaluation in simulation learning focuses on three capacities: students, facilitators, and the quality of the simulation experience. Notably, it is within the scope of lecturers/educators/instructors to administer such evaluations using tools with an approved validity and reliability test score. However, according to Hayden et al. (2014), there has been a gap in nursing education, and educators have struggled to fulfil this requirement. Kardong-Edgren et al. (2010) alluded that this situation has hindered the uptake of simulation-based education.

Ten (10) instruments used when evaluating the identified faculties were found in this scoping review. They were the (a) Creighton Competency Evaluation Instrument (CCEI); (b) Lasater Clinical Judgement Rubric (LCJR); (c) Quality and Safety Education for Nurses (QSEN); (d) Obstetric Nursing Self-Efficacy (ONES); (e) Preparedness for Hospital Practice Questionnaire (PHPQ) and (g) Debriefing Assessment for Simulation Healthcare Student Version (DASH-SV). All these tools were for evaluating student performance during the simulation experience. (h) Debriefing Assessment for Simulation Healthcare Rater Version (DASH-RV) is an instrument for evaluating the facilitator's debriefing skills. While the following: (i) Simulation Perspective Survey (SPS) and (j) Program Assessment Survey for Simulation (PASS) are used for evaluating the quality of the simulation experience. Some of these instruments lacked reliability and validity test scores. Kardong-Edgren et al. (2010) reached similar conclusions; they discovered twenty-two (22) evaluation tools and suggested refinement of the existing instruments to strengthen their reliability and validity.

4.10.4 Innovations in Simulation

Innovative teaching strategies that enhance the acquisition of learning outcomes across undergraduate courses were identified in this scoping review. They included virtual simulation, extended immersive simulation and escape room exercises.

Virtual simulation is an emerging educational approach in simulation learning; research evidence indicates that it offers comparable opportunities for achieving clinical competencies across all the core undergraduate courses. For example, Guise et al. (2012) reported that

virtual patients (VPs) could help develop critical thinking skills, communication and clinical decisions on assessment, diagnosis, treatment, and therapeutic care. Another competency that could be learned using virtual patients is wound management skills (Redmond et al., 2020). Moreover, this scoping review showed that all simulation users must use the INACSL Standards as a benchmark material resource.

4.11 CONCLUSION

This scoping review explored existing evidence on best practices in simulation-based nursing education to inform the subsequent phases of this study, particularly phase three. The next chapter presents the survey study findings.

CHAPTER 5: SURVEY RESEARCH

5.1 INTRODUCTION

Survey research was the method that guided the inquiry process in phase two. The study's objective was to assess the current state of simulation use in the educational preparation of Bachelor of Nursing Science students in Eswatini. Two surveys (A and B) addressed this study's objective. Each survey study's findings were analysed and discussed separately.

5.2 SURVEY A: FINDINGS

In survey study A, the Eswatini simulation centres/laboratories were assessed/audited to determine the availability of human and material resources for supporting simulation learning using a tool developed by Riabtseva et al. (2015). Riabtseva et al. (2015) simulation centre auditing tool has three variables/domains: (a) Instructor/staff needs, (b) Financial and resource planning and (c) Infrastructure and equipment. Each variable has multiple itemised criteria. The results of this study were analysed using descriptive statistics, in which frequencies and percentages were generated from the SPSS 20.0. data analysis software.

5.2.1 Characteristics of the Simulation Centres/Laboratories

The results are shown in Table 5.1 below, indicating that 50% (n=2) of the simulation centres/laboratories were found in NEI-A (SimLab1 and SimLab2). SimLab1 was designated for teaching general nursing skills, and SimLab2 was reserved for preparing midwifery students. Moreover, 50% (n=2) of the simulation laboratories were public (government) owned (SimLab1 and SimLab2), and SimLab3 and SimLab4 were privately owned (Faith-Based Organisations/ Missionaries).

Table 5.1: Background characteristics of the simulation centres/laboratories (N=4)

Variable and Category	TOTAL (n,%)	Simulation centres/laboratories			
		SimLab1 (n,%)	SimLab2 (n,%)	SimLab3 (n,%)	SimLab4 (n,%)
N	4	1(25)	1(25)	1(25)	1(25)
Simulation laboratories within NEI:					
NEI-A	2(50)	1(50)	1(50)	0	0
NEI-B	1(25)	0	0	1(100)	0
NEI-C	1(25)	0	0	0	1(100)
Type of NIE:					
Public	2(50)	1(50)	1(50)	0	0
Private	2(50)	0	0	1(50)	1(50)

5.2.2 Domain A: Instructor/Staff Needs

The instructor/staff needs domain has two sub-elements: human resources and educators' training in aspects of simulation use, evaluated using twenty (20) criteria items. Knowing the state of instructors/staff needs is essential. Riabtseva et al. (2015) stated that it ascertained whether the simulation centre/laboratory had trained academic staff knowledgeable about their tasks and objectives in simulation-based education.

5.2.2.1 Human Resources

Four criteria/items helped to determine the state of human resources available for supporting simulation learning in the Eswatini simulation centres/laboratories using three nominal variables: "Yes, No and N/A". However, some answer options are not discussed because participants did not select them.

The findings regarding the state of human resources showed that 75% (n=3) of the simulation centres/laboratories (SimLab1; SimLab2; SimLab4) had no designated faculty member responsible for coordinating simulation activities, and 25%, n=1, (SimLab3) was the only one with a simulation coordinator (champion). Additionally, in all the simulation centres/laboratories (100%, n=4), there was a poor ratio of lecturers to students during the simulation sessions. However, all the simulation centres/laboratories 100% (n=4) had designated personnel to provide technical assistance to educators and ensure appropriate

simulation equipment management. None required secretarial support in all simulation centres/laboratories. The findings suggest that the Eswatini NEI simulation centres/laboratories have inadequate instructors/staff to facilitate and coordinate (champion) simulation-based education activities. The findings are depicted in Table 5.2 below:

Table 5.2: The state of human resources in the simulation centre/laboratories (N=4)

Criteria	SimLab	Response	Frequency	Percentage (%)
Human resources for the simulation centre/laboratory:				
Designated Simulation Coordinator	SimLab1 SimLab2 SimLab3	No	3	75
	SimLab4	Yes	1	25
Adequate ratio of lecturers to students	SimLab1 SimLab2 SimLab3 SimLab4	No	4	100
Availability of simulation technicians	SimLab1 SimLab2 SimLab3 SimLab4	Yes	4	100
Availability of secretariate support	SimLab1 SimLab2 SimLab3 SimLab4	N/A	4	100

5.2.2.2 The State of Trained Educators in Aspects of Simulation Use

Sixteen (16) items were used to determine the availability of educators trained in the various aspects of simulation in these simulation centres/laboratories. The response options for this element were All, Most, Some and None. Results are described and shown in Table 5.3

below:

SBE initiation process training needs: None of the educators were trained in integrating simulation into the curriculum and planning a simulation. Moreover, 75% (n=3) of the simulation centres/laboratories had trained nurse educators in applying the regulations, guidelines and protocols inherent to simulation use, and 25% (n=1) (SimLab1) had untrained educators. Overall, the findings suggest a lack of nurse educators with adequate skills for initiating a simulation-based education programme.

SBE preparation process training needs: None of the simulation centres/laboratories had educators trained in writing scenarios. However, 75% (n=3) of the simulation centres/laboratories had trained educators in developing assessment tools, and 25% (n=1) (SimLab1) had untrained ones. In 50% (n=2) of the simulation centres/laboratories, all educators were trained in preparing equipment for simulation training, and in 25 % (n=1), most were trained. SimLab1 reported that none of their educators was trained in this skill. The results show a learning gap concerning scenario development skills across the simulation centres/laboratories.

SBE educational strategies and equipment training needs (SPs, computerised and non-computerised mannequins, task trainers, MFS and HFS equipment): None of the simulation centres/laboratories had educators trained in preparing and using standardised patients, non-computerised and computerised mannequins and high-fidelity mannequins. However, 50% (n=2) of the simulation centres/laboratories had some educators skilled in using task trainers and medium-fidelity equipment, while SimLab1 reported having none trained in these aspects. The findings indicate a need for training educators in using simulation equipment to meet student and patient outcomes across fidelity levels.

SBE implementation process training needs: The results showed that none of the simulation centres/laboratories had educators trained in implementing a scenario, including providing briefing and debriefing to students. However, 75% (n=3) of the simulation centres/laboratories had trained educators in evaluating a simulation learning experience using recognised instruments, while SimLab1 was reported to have none trained. Half, 50% (n=2), had trained educators in managing simulation equipment after the simulation. The findings suggest that educators need training in developing simulation scenarios and planning and implementing briefing and debriefing to achieve students' learning outcomes.

Table 5.3: State of Trained Educators in Aspects of Simulation Use in the Simulation Centres/Laboratories (N=4)

Criteria	SimLab	Response	Frequency (n)	Percentage (%)

Trained educators on aspects required for the SBE initiation process: Integrating simulation into the curriculum	SimLab1 SimLab2 SimLab3 SimLab4	None	4	100
Planning a simulation	SimLab1 SimLab2 SimLab3 SimLab4	None	4	100
Applicable regulations, guidelines, and local protocols	SimLab2 SimLab3 SimLab4	All	3	75
	SimLab1	None	1	25
Trained educators on aspects required for the SBE preparation process: Writing scenarios	SimLab1 SimLab2 SimLab3 SimLab4	None	4	100
Developing assessment tools for student assessment, e.g. checklists	SimLab2 SimLab3 SimLab4	All	3	75
	SimLab1	None	1	75
Preparing simulation equipment for training	SimLab3 SimLab4	All	1	25
	SimLab2	Most	2	50
	SimLab1	None	1	25
Trained educators on using simulation tools and equipment: The use and preparation of standardised patients	SimLab1 SimLab2 SimLab3 SimLab4	None	4	100
The use of computerised mannequins	SimLab1 SimLab2 SimLab3 SimLab4	None	4	100
The use of non-computerised mannequins	SimLab2 SimLab3	All	2	50
	SimLab4	some	1	25
	SimLab1	None	1	25
The use of task trainers	SimLab2	ALL	1	25
	SimLab3 SimLab4	Some	2	50
	SimLab1	None	1	25
The use of medium-fidelity equipment	SimLab2	Most	1	25
	SimLab3	Some	1	25
	SimLab1 SimLab4	None	2	50

The use of high-fidelity equipment	SimLab1 SimLab2 SimLab3 SimLab4	None	4	100
Trained educators on aspects needed for the SBE implementation process: Implementing a scenario (including briefing, action, and debriefing)	SimLab1 SimLab2 SimLab3 SimLab4	None	4	100
Evaluating a simulation using a recognised instrument.	SimLab2 SimLab3 SimLab4	All	3	75
	SimLab1	none	1	25
Debriefing of students after a simulation exercise	SimLab4	Some	1	25
	SimLab1	None	3	75
	SimLab2 SimLab3			
Management of equipment after the training session	SimLab3 SimLab4	All	2	50
	SimLab2	Some	1	25
	SimLab1	None	1	25

5.2.3 Domain B: Financial and Resource Planning

The financial and resource planning variable/domain comprises two components that need to be evaluated: one-time and recurrent costs/investments. Fifteen (15) items were used to assess the financial and resource plans made or planned for the Eswatini simulation centres/laboratories. Assessing the state of financial and resource planning informs about the sustainability of the simulation-based education programme (Riabtseva, Reynolds and Gisin, 2015). The response options were: "Yes, Partially, No, and N/A". Findings are shown in Table 5.4 below.

5.2.3.1. One-time costs/investments made or planned for financing the simulation centres/laboratories

Six (6) criteria/items were used to assess the state to which the Eswatini nursing education institutions had invested or made plans to finance one-time resources needed for the implementation and sustainability of SBE. The results are presented below:

Made or planned finances for one-time resources: none of the simulation centres/laboratories had made or planned for finances for purchasing simulation scenarios software and funding educators' training expenses in all the simulation centres/laboratories.

However, most, 75% (n=3) (SimLab1, SimLab3, and SimLab4), had partially made or planned finances for purchasing some of the one-time resources, including allocating or building space for the simulation learning environment, mannequins and the furniture (hospital beds, chairs and cabinets), while SimLab2 had none. Moreover, in 50% (n=2) of the simulation centres/laboratories (SimLab2 and SimLab3), no financial plans were made or planned for funding technological devices such as computers and videos. At the same time, SimLab4 reported to have partially made those plans, and only SimLab1 had allocated or planned funds for these resources. The finding suggests that intervention is required to meet financial needs for funding one-time resources needed to operate the simulation centres/laboratories.

5.2.3.2 Recurrent costs/investments made or planned to finance simulation-based education

Nine (9) criteria were used to assess the state of financial plans made or planned for recurrent costs/investments needed to sustain simulation-based education in Eswatini nursing education institutions' simulation centres/laboratories. The results are presented below:

Made or planned finances for recurrent costs/investments: The results of this study showed that all the simulation centres/laboratories (100%, n=4) had made or planned funds needed for financing recurrent costs such as salaries for trainers, purchase of paper and toner and payment of utility bills. However, in all the simulation centres/laboratories, plans for buying consumable materials and budget for equipment maintenance, repairs and depreciation were partially made or planned. In comparison, 50% (n=2) (SimLab1 and SimLab2) had finances made or planned for educators' skills advancement expenses, while the other simulation centres, 50% (n=2) (SimLab3 and SimLab4), had no such financial plans. On the other hand, all simulation centres/laboratories had no funds made available or planned for financing membership to a recognised Simulation Healthcare Society (SHS), indicating a lack of knowledge about the importance and benefits of affiliating with such organisations. Whereas financing transport and accommodation costs of trainees were not applicable in all the simulation centres/laboratories. The findings indicate a need for revised financial plans to sustain funding of recurrent costs.

Table 5.4: Financial and Resource Plans for Supporting Simulation Use (N=4)

Criteria	SimLab	Response	Frequency (n)	Percentage (%)
One-time costs/investments made or planned for include the financing of:				
Allocation or building premises required for the operation of a Simulation Centre	SimLab1 SimLab3 SimLab4	Partial	3	75
	SimLab2	no	1	25
Purchasing of manikins and other simulation equipment	SimLab1 SimLab3 SimLab4	Partial	3	75
	SimLab2	No	1	25
Purchasing or allocating appropriate furniture, such as hospital beds, cabinets, tables, chairs, etc.	SimLab1 SimLab3 SimLab4	Partial	3	75
	SimLab2	no	1	25
Purchasing or allocating video/audio, computer, and office equipment (e.g. multimedia projector, screen, speakers, video cameras, printer, etc.)	SimLab1	Yes	1	25
	SimLab2 SimLab3	No	2	50
	SimLab4	Partial	1	25
Purchasing or allocating additional software required for simulation scenarios or technical needs.	SimLab1 SimLab2 SimLab3 SimLab4	No	4	100
Purchasing or allocating money to support the initial training of trainers and other personnel (travel, tuition fees, salaries for the training period, etc.)	SimLab1 SimLab2 SimLab3 SimLab4	No	4	100
Recurrent costs/investments made or planned for include the financing of:				
Salaries for trainers and assisting personnel (reimbursing for the time spent on training)	SimLab1 SimLab2 SimLab3 SimLab4	No	4	100
Purchase of consumable materials for simulation-based learning	SimLab1 SimLab2 SimLab3 SimLab4	Yes	4	100
Purchase of paper and toner (or cartridge) for printing/copying handouts and other materials provided to trainees	SimLab1 SimLab2 SimLab3 SimLab4	Yes	4	100

Travel costs for trainees from remote areas	SimLab1 SimLab2 SimLab3 SimLab4	N/A	4	100
Accommodation for trainees from remote areas (when staying overnight)	SimLab1 SimLab2 SimLab3 SimLab4	N/A	4	100
Equipment maintenance, repairs (including the cost of labour and spare parts), and depreciation;	SimLab1 SimLab2 SimLab3 SimLab4	Partial	4	100
Utility bills (electricity, heating, water, etc.); Expenses related to further training, education,	SimLab1 SimLab2 SimLab3 SimLab4	Yes	4	100
Skill advancement for personnel (travel expenses for attending courses, workshops, conferences; tuition or registration fees; other related expenses).	SimLab1 SimLab2	Partial	2	50
	SimLab3 SimLab4	No	2	50
Membership of a recognised Simulation in the Health care society	SimLab1 SimLab2 SimLab3 SimLab1	No	4	100

5.2.3.3 State of financial and resource planning within the simulation laboratories

Figure 5.1 indicates that SimLab1 and SimLab4 have better invested in one-time resources (66.7%) compared to SimLab3 and SimLab2, which obtained a percentage of 58.3% and 54.2%, respectively. However, regarding plans for financing recurring costs, the simulation laboratories are at a similar state, with the public-owned simulation centres taking the lead at 69.4% compared to the privately owned, which had a proportion of 66.7%. Overall, the findings indicate a need to strengthen the financial resource plans to ensure the sustainability of the learning system.

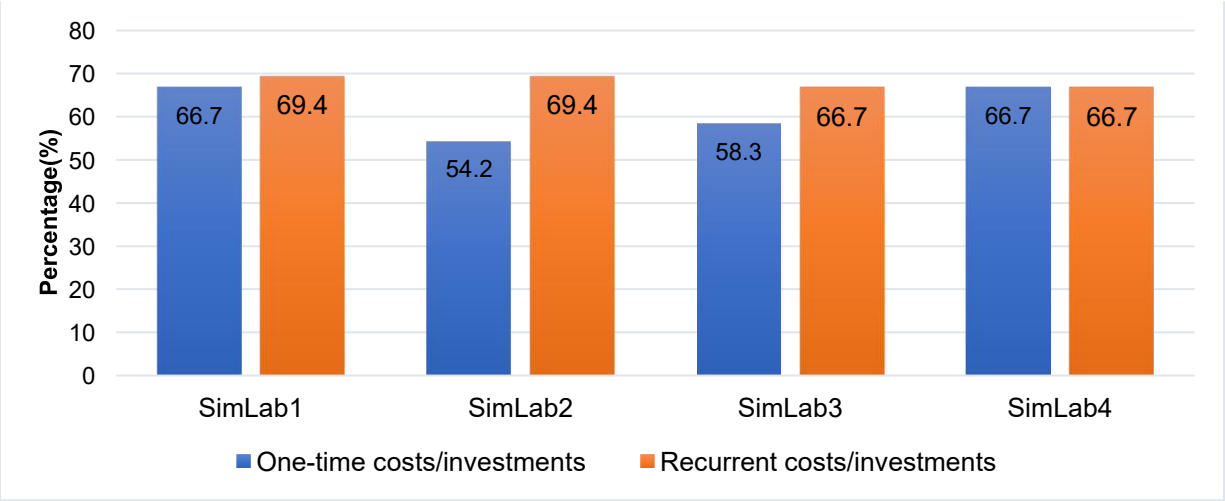


Figure 5.1: State of Financial and Resource Planning within the simulation laboratories (N=4)

5.2.4 Domain C: Infrastructure and Equipment

This domain concerns infrastructure design and equipment needed to support simulation learning (Riabtseva et al., 2015). Twenty-seven itemised criteria, subdivided into five (5) sub-elements, were used to assess the infrastructure and equipment available or planned for simulation learning in the Eswatini nursing education institutions' simulation centres/laboratories. The sub-elements for this variable are simulation infrastructure design components, general infrastructure, simulation equipment, clinical equipment and technical equipment.

5.2.4.1 Available or planned infrastructure design

This sub-element has nine criteria used to assess the state of the available or planned infrastructure design of the simulation centres/laboratories. Three options, "Yes, No and N/A, were the response categories for this sub-element.

Table 5.5 below demonstrates that the simulation centres/laboratories (100%, n=4) met only two of the nine itemised criteria: more than 30 square metres of learning space and a storage room. Toilets/washrooms were available in 50% (n=2) of the simulation centres/laboratories, and SimLab2 and SimLab3 had none. At the same time, none of the simulation centres/laboratories had an autonomous entrance, observation room, standardised patient

resting and preparation room and debriefing room. The findings suggest a need for redesigning the simulation centres/laboratories to incorporate the missing essential structures necessary for successful simulation learning.

Table 5.5: Aspects of infrastructure design in the simulation centres/laboratories (N=4)

Criteria	SimLab	Response	Frequency (n)	Percentage (%)
The simulation centre or the structure planned as a simulation centre has:				
An autonomous door:	SimLab1 SimLab2 SimLab3 SimLab4	No	4	100
Minimal contact between the simulation team and patients in the clinical environment (when the simulation centre is part of a healthcare facility).	SimLab1 SimLab2 SimLab3 SimLab4	N/A	4	100
At least one simulation (training) room (size ≥ 30 sq m)	SimLab1 SimLab2 SimLab3 SimLab4	Yes	4	100
One observation room (technical / computer)	SimLab1 SimLab2 SimLab3 SimLab4	No	4	100
A meeting room (debriefing room) is ideally separated from the simulation room by a big glass window.	SimLab1 SimLab2 SimLab3 SimLab4	No	4	100
A room for preparation of standardised patients and rest between simulation	SimLab1 SimLab2 SimLab3 SimLab4	No	4	100
A debriefing room	SimLab1 SimLab2	No	4	100
	SimLab3 SimLab4			
A storage room	SimLab1 SimLab2 SimLab3 SimLab4	Yes	4	100
A toilet/washroom	SimLab1 SimLab4	Yes	2	50
	SimLab2 SimLab3	No	2	50

5.2.4.2 Available or planned general infrastructure resources

This sub-element has six criteria used to assess the state of the available or planned general infrastructure in the simulation centres/laboratories. Three options, "Yes, No and N/A, were the response categories for this sub-element. All the simulation centres/laboratories had electrical outlets and adequate lighting in the physical learning structure. However, there was oxygen supply, air and water supply in 75% (n=3) of the simulation centres/laboratories, 50% (n=2) had a suction system, and SimLab1 and SimLab3 had no suction system in the general structure. The findings reflect another need for intervention to support simulation learning in the simulation centres/laboratories successfully. The results are shown in the table below:

Table 5.6: General infrastructure in the simulation centres/laboratories (N=4)

Criteria	SimLab	Response	Frequency (n)	Percentage (%)
General infrastructure in the simulation centre includes: A water supply system	SimLab1 SimLab3 SimLab4	Yes	3	75
	SimLab2	No	1	25
An oxygen supply	SimLab1 SimLab2 SimLab4	Yes	3	75
	SimLab3	No	1	25
Air	SimLab2 SimLab3 SimLab4	Yes	3	75
	SimLab1	No	1	25
A suction system	SimLab2 SimLab4	Yes	2	50
	SimLab1 SimLab3	No	2	50
Adequate lighting	SimLab1 SimLab2 SimLab3 SimLab4	Yes	4	100
Electrical outlets	SimLab1	Yes	4	100
	SimLab2 SimLab3 SimLab4			

5.2.4.3 Available or planned simulation equipment

This element has four (4) criteria used to assess the available or planned simulation equipment for use in the simulation laboratories. The Yes, No and N/A response categories

were used to seek answers for this sub-element. The results in Table 5.7 indicate that most simulation centres/laboratories had no critical care mannequins and simulation scenario software. Moreover, only SimLab1 had obstetric or midwifery mannequins. Also, 50% (n=2) of the simulation laboratories had monitors, while SimLab 3 and 4 had none. The findings indicate a critical shortage of resources for teaching nursing and midwifery skills in the simulation laboratories.

Table 5.7: Simulation equipment in the laboratories (N=4)

Criteria	SimLab	Response	Frequency (n)	Percentage (%)
Available or planned Simulation equipment includes:	SimLab2 SimLab3 SimLab4	No	3	75
Obstetric/midwifery mannequins	SimLab1	N/A	1	25
Critical care mannikins	SimLab1 SimLab2 SimLab3 SimLab4	No	4	100
Monitors	SimLab1 SimLab2	Yes	2	50
	SimLab3 SimLab4	No	2	40
Software for clinical scenario simulation	SimLab1 SimLab2 SimLab3 SimLab4	No	4	100

5.2.4.4 Available or planned clinical equipment

Clinical equipment refers to hospital-based material resources or medical supplies that should be provided in a simulation centre/laboratory to facilitate clinical teaching-learning for nursing students. Twenty-four itemised criteria were used to assess the state of clinical equipment in the simulation centres/laboratories. Categorical response options were; "Yes, Some, No and N/A. Table 5.8 below presents findings of clinical equipment found or planned in the simulation centres/laboratories.

All the simulation centres/laboratories had beds, stethoscopes, hand sanitiser and tourniquets. However, simulated drugs, nasal canulae, disposal gowns and gloves, surgical equipment for suturing, sterile gloves, and foetal stethoscopes were available in 75% (n=3) of the simulation centres/laboratories. Equipment such as ambu bags, obstetric equipment (vacuum extractors), boxes with emergency care medicines and supplies, boxes with sterile

materials, and urinary and intravenous catheters were available in 50% (n=2) of the simulation centres/laboratories. At the same time, most of the equipment above was unavailable in 50% (n=2) of the sites.

All the simulation centres/laboratories did not have nasal canulae for continuous positive airway pressure (CPAP) therapy. About 75% (n=3) had no defibrillators, only available in SimLab2. Endotracheal tubes were not found in 50% (n=2) of the simulation laboratories (SimLab3 and SimLAB4). Some endotracheal tubes were found in SimLab 1, while SimLab2 had all sizes. The results indicate that the simulation centres/laboratories had most of the required clinical equipment to some extent, as shown in Table 5.8 below:

Table 5.8: Clinical Equipment in the Simulation Centres/Laboratories (N=4)

Criteria	SimLab	Response	Frequency (n)	Percentage (%)
Available or planned clinical equipment includes: Beds	SimLab1 SimLab2 SimLab3 SimLab4	Yes	4	100
Simulated medicines (can be expired drugs)	SimLab2 SimLab3 SimLab4	Yes	3	75
	SimLab1	Some	1	25
Monitoring equipment (pulse oximeter, blood pressure device, ECG	SimLab2	Yes	1	25
	SimLab1 SimLab3 SimLab4	Some	3	75
Ambu bag with a mask for adults, children, and newborn	SimLab1 SimLab2	Yes	2	50
	SimLab3	No	1	25
	SimLab4	Some	1	25
Endotracheal tubes of all sizes	SimLab2	Yes	1	25
	SimLab1	Some	1	25
	SimLab4 SimLab3	No	2	50
Oral Pharyngeal airway (for adults and newborns)	SimLab1	Yes	1	25
	SimLab2 SimLab3	Some	2	50
	SimLab4	No	1	25
Nasal cannulae for CPAP therapy (positive pressure during exhalation)	SimLab1 SimLab2 SimLab3 SimLab4	No	4	100

Nasal cannulae for oxygen therapy	SimLab1 SimLab2 SimLab4	Yes	3	75
	SimLab3	No	1	25
Obstetrical equipment (vacuum extractor, obstetric forceps, set of vaginal specula)	SimLab2 SimLab4	Yes	2	50
	SimLab1	Some	1	25
	SimLab3	No	1	25
Defibrillator	SimLab2	Yes	1	25
	SimLab1 SimLab3 SimLab4	No	3	75
Surgical equipment for suturing	SimLab1 SimLab2 SimLab3	Yes	3	75
	SimLab1	Some	1	25
Boxes with a set of medicines and supplies for emergency care in such conditions	SimLab2 SimLab4	Yes	2	50
	SimLab1	Some	1	25
	SimLab3	No	1	25
Nasal cannulae for oxygen therapy	SimLab1 SimLab2 SimLab4	Yes	3	75
	SimLab3	No	1	25
Medical (disposable) gowns, masks	SimLab1 SimLab2 SimLab4	Yes	3	75
	SimLab3	No	1	25
Sterile and disposable rubber gloves	SimLab2 SimLab4 SimLab1	Yes	3	75
	SimLab3	No	1	25
Box with sterile material (sterile compresses, etc.)	SimLab2 SimLab4	Yes	2	50
	SimLab1 SimLab3	No	2	50
Catheters for aspiration of newborns (F10,12,14)	SimLab2 SimLab4	Yes	2	50
	SimLab1 SimLab3	No	2	50
Urinary catheters	SimLab2 SimLab4	Yes	2	50
	SimLab1 SimLab3	No	2	50
Stethoscope	SimLab1 SimLab2 SimLab3 SimLab4	Yes	4	100

Foetal stethoscope	SimLab1	N/A	1	25
	SimLab2			
	SimLab3 SimLab4	Yes	3	75
Hand sanitiser	SimLab1 SimLab2 SimLab3 SimLab4	Yes	4	100
IV catheters for adults - 20 G, 18G, 16G, for newborns, 24G, 22G	SimLab2 SimLab4	Yes	2	50
	SimLab1 SimLab3	Some	2	50
Infusion systems, infusion solutions (NaCl 0.9%)	SimLab1 SimLab2	Yes	3	75
	SimLab4 SimLab3	Some	1	25
Adhesive plaster	SimLab1	Yes	1	25
	SimLab2 SimLab3 SimLab4	Some	3	75
Tourniquet	SimLab1 SimLab2 SimLab3 SimLab4	Yes	4	100

5.2.4.5 Available or planned technical equipment

The state of technical equipment needed to support successful simulation learning was examined using three criteria items. The response categories for this element were "Yes, No and N/A". Table 5.9 indicates that none of the simulation centres/laboratories (0%) had the technical equipment (video system, audio system and a system for recording and broadcasting) to support successful simulation learning.

Table 5.9: Technical equipment in the simulation centres/laboratories (N=4)

Criteria	SimLab	Response	Frequency (n)	Percentage (%)
Available or planned technical equipment: Video system	SimLab1 SimLab2 SimLab3 SimLab4	No	4	100
Audio system	SimLab1 SimLab2 SimLab3 SimLab4	No	4	100
System for recording and broadcasting	SimLab1 SimLab2 SimLab3 SimLab4	No	4	100

5.2.4.6 State of infrastructure and equipment within the simulation centres/laboratories

Figure 5.2 below informs that SimLab2 had the highest proportion of equipment (90%) despite having an infrastructure (68.9%) that lacks most of the structures needed in a simulation learning environment. In comparison, SimLab1 and SimLab3 had a higher proportion of the physical infrastructure, 80% and 77.8%, respectively, relative to the equipment (72.5% and 70%), that students need to learn nursing skills, whilst SimLab4 had both resources at a similar state.

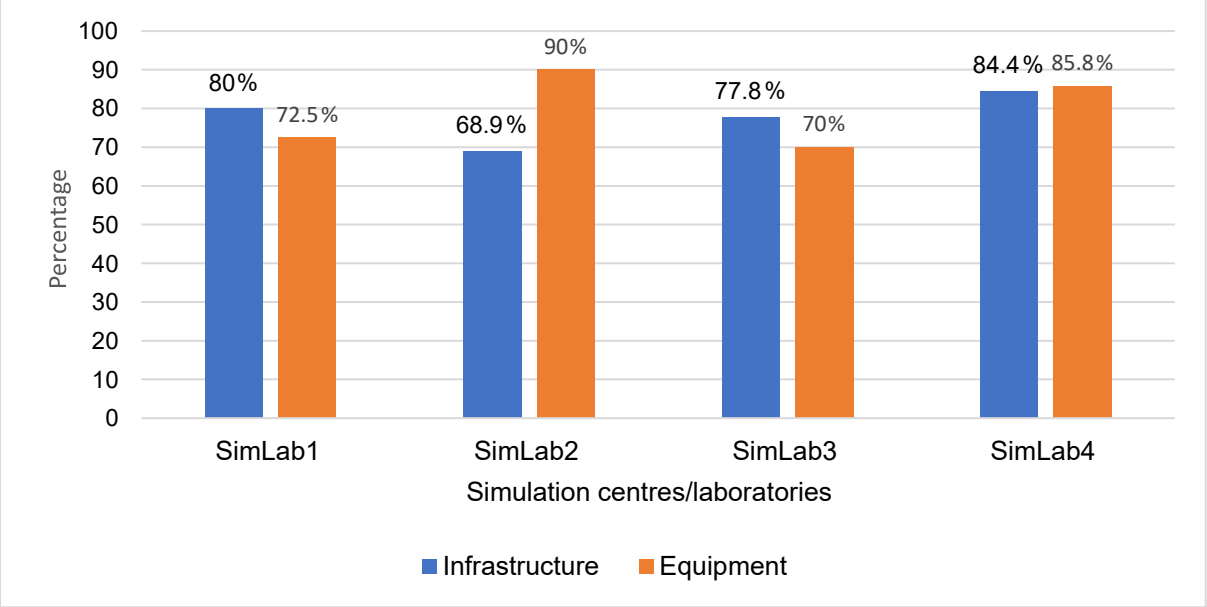


Figure 5.2: State of infrastructure and equipment within the simulation centres/laboratories (N=4)

5.2.5 Overall State of Simulation in the Simulation Centres/Laboratories

The findings show that better commitment is required towards providing infrastructure and equipment (63%) needed to support simulation learning. Moreover, the financial and resource plans are barely made, indicated by a score of 54%, and the worst are the instructor/staff needs, which are at 28%. Overall, all the simulation laboratories were operating in a state where much attention was needed to advance simulation use, successfully integrate simulation, sustain it and ensure the provision of quality clinical learning experiences to nursing students. Findings are shown in Figure 5.4 below:

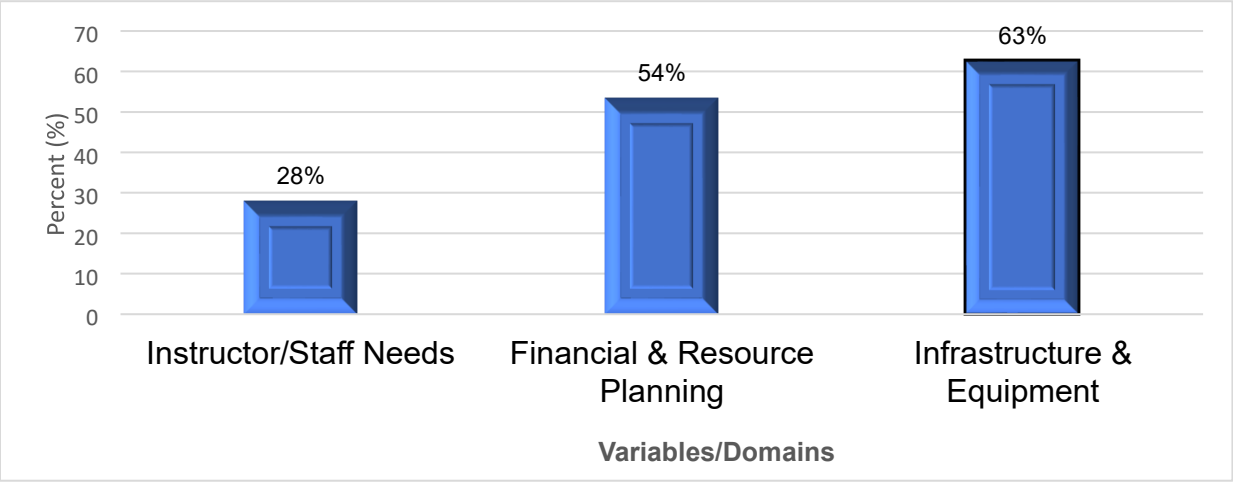


Figure 5.3: Overall state of simulation use in the simulation centres/laboratories (N=4)

5.3 SURVEY B: FINDINGS

5.3.1 INTRODUCTION

The Survey B study also addresses the objective of the state of simulation use in the educational preparation of the Bachelor of Nursing Science programme in Eswatini through the opinions of nurse educators/lecturers. Data were gathered using a Simulation Culture Organisational Readiness Survey (SCORS) tool developed by Foisy-Doll and Leighton (2017a). The data set was analysed using descriptive statistics to produce means and standard deviations using the SPSS 20.0 version.

The Foisy-Doll and Leighton (2017a) SCORS tool has four sections/domains: (a) Defined need and support for change, (b) Readiness for culture change, (c) Time, personnel and resource readiness and (d) Sustainability practices to embed culture. It consists of 5-point Likert-scale items. The 5-point Likert-scale items categories are arranged and rated as follows: (a) None at all =1; (b) A little=2; (c) Somewhat=3; (d) Moderately=4 and (e) Very much=5. The socio-demographic variables of the participants were obtained and were as follows:

5.3.2 Socio-demographic Characteristics of the Participants

The socio-demographic characteristics of this study's participants are shown in Table 5.10 below. The total number of participants was 46 (93.9%) out of 49 nurse educators in all NEIs

that prepare the Bachelor of Nursing Science students in Eswatini. Most participants, 56.5% (n=26), were from NEI-A, 23.9% (n=11) were from NEI-C, and 19.6% (n=9) were from NEIB. The noticeable gap between NEI-A and the others regarding staffing could be that it offers more undergraduate programmes than the other institutions.

The majority of the study participants, 82.6% (n=38), were females compared to males 17.4% (n=8). NEI-C had the highest proportion of female participants, 90.9% (n=10), compared to males, while the majority of male participants, 23.1% (n=6), were from NEI-A. The largest group of the participants, 23.9% (n=11), were between 36 to 45 years from NEIB, and the least were those between 46 to 50 years (4.3%, n=2) from NEI-C. Very few were below 35 years old (10.9%, n=5), all from NIE-A. The findings indicate that the educators are within the average age range.

Most of the participants, 65.2% (n=30), were holders of a master's degree, followed by 32.6% (n=15) doctorate holders, and 2.2% (n=1) bachelor's degree holders. However, NEIA had the most significant proportion of participants who possessed the highest level of qualification (50%, n=13), a doctorate, followed by NEI-B (11.1%, n=1). In comparison, NEI-C was the only one with participants with a bachelor’s degree. The differences could be attributed to NIE-A offering undergraduate and postgraduate degrees (master's programmes) while NEI-B and NEI-C currently offer undergraduate degrees. Most of the participants, 30.4% (n=14), had been educators for 5-9 years, followed by 23.9% (n=11), 14 years of service, and 8.7% (n=7) had been in service for between 15 and 19 years.

None of the participants received formal simulation training from an accredited programme, such as Certified as a Healthcare Simulation Educator (CHSE). The largest group of the participants, 34.9% (n=16), were prepared through in-service training (peer-to-peer, workshops, and conferences), 32.6% (n=15) were self-trained through reading widely, 17.4% (n=8) were trained during the B.Ed. in Nursing and, 15.2% (n=7) were never trained on how to teach using simulation. Nevertheless, all the participants 100% (n=46) teach courses with a clinical/practicum component.

Table 5.10: Socio-demographic characteristics of the study participants (N=46)

Variable Category	Total (n,%)	INSTITUTION			p-value
		NEI-A (n,%)	NEI-B (n,%)	NEI-C (n,%)	
N	46	26(56.5)	9(19.6)	11(23.9)	
Sex:					
Female	38 (82.6)	20(76.9)	8(88.9)	10(90.9)	0.507
Male	8(17.4)	6(23.1)	1(11.1)	1(9.1)	
Age range:					
31-35 years	5(10.9)	5(19.8)	0	0	
36-40 years	11(23.9)	6(23.1)	3(33.3)	2(18.2)	
41-45 years	2(4.3)	0	0	2(4.3)	
46-50 years	6(13)	4(15.4)	0	2(13)	0.293
51-55 years	6(13.)	2(7.7)	2(22.2)	2(13)	
56-60 years	5(10.9)	3(11.5)	1(11.1)	1(9.1)	
61 plus years					
Highest qualification level:					
Bachelor's degree	1(2.2)	0	0	1(2.2)	
Mater's degree	30(65.2)	13(50)	8(88.9)	9(81.8)	
Doctorate	15(32.6)	13(50)	1(11.1)	1(9.1)	0.028
Duration of service:					
1-4 years	11(23.9)	5(19.2)	4(44.4)	2(18.2)	
5-9 years	14(30.4)	10(71.4)	0	4(36.4)	
10-14 years	10(21.7)	6(23.1)	2(22.2)	2(18.2)	
15-19 years	4(8.7)	2(7.7)	2(22.2)	0	0.284
20 plus years	7(15.2)	3(11.5)	1(11.1)	3(27.3)	
Simulation training received:					
In-service	16(34.5)	7(26.9)	4(44.4)	5(45.5)	
Self-trained	15(32.6)	8(30.8)	2(22.2)	5(45.5)	0.425
Formal trained (CHSE)	0	0	0	0	
During Nursing Ed. Training	8(17.4)	7(26.9)	1(11.1)	0	
Never trained	7(15.2)	4(15.4)	2(22.2)	1(9.1)	
Teaching clinical courses:					
Yes	46(100)	26(56.5)	9(19.6)	11(23.9)	n/a

Note: CHSE-Certified Healthcare Simulation Educators; Ed.-education

5.3.2.1 Associations between socio-demographic variables

Age and duration of service as a lecturer: The data support a significant positive relationship between age and duration of being a lecturer (r=0.750, p=0.001), indicating that as the age increases, the duration of being a lecturer increases at p≤ = 0.05.

Age and highest qualification: there was a significant relationship between age and highest qualification (r=0.326, p=0.027), meaning doctorate holders were older at p≤ = 0.05.

Duration of service and highest qualification: the relationship between the duration of service and highest qualification was statistically significant at (r-0.464, p=0.001), indicating that those with a longer duration of service were doctorate holders compared to master's degrees.

5.3.3 Main Study Findings

Interpreting the SCORS survey findings involves computing the item and the overall mean score (Foisy-Doll and Leighton, 2017a). The SCORS Likert scale item score was between 1 and 5, and the acceptable item mean score for this study was three (3). Foisy-Doll and Leighton (2017a) explained that the itemised criteria could be improved with minimal effort if its mean falls into the selected range. Concerning the overall state, Foisy-Doll and Leighton (2017a) stated that the possible score ranges between 36-180 points and is interpreted as shown in Table 5.11:

Table 5.11: Shows the interpretation of the overall score

Overall Mean Score	Interpretation/meaning
0-36	None at all
37-72	A little
73-108	Somewhat
109-144	Moderately
144-180	Very much

Adapted from Foisy-Doll and Leighton (2017) SCORS Guidebook

5.3.4 Domain A: Defined Need and Support for Change

The domain or variable of defined need and support for change examines the level of commitment of the institution to support simulation-based education (Foisy-Doll and Leighton, 2017a). This variable was assessed using nine itemised criteria, as shown in Table 5.12 below:

The participants expressed that innovation, experiential and quality student experiences are central to the institution's mission and philosophy (mean=3.57, SD=1.068); there was an

expressed need for SBE (mean=3.04, SD=1.316); SBE was currently used as a teaching modality (mean=3.52, SD=1.005); educators articulated the need for integrating SBE into the curriculum (mean=3.91, SD=1.092) and had verbalised commitment to SBE integration into the curriculum (mean=3.43, SD=1.223). The findings on the identified aspects indicate that the institutions use SBE and have defined the need and support change to some extent, given that some criteria items had mean scores that fell below the acceptable degree. Four criteria items showed a lack of readiness to support change:

The educators' responses showed that the management made minimal effort to communicate a clear strategic vision for SBE (mean=2.39, SD=1.325) with a lower bound mean of 2 and upper bound mean of 2.78 at a 95% confidence interval. This finding suggests a need for incorporating SBE into the institution's strategic vision to ensure sustainability and support for change. In addition, there was a significant relation between defined need and support for change and communicating a clear strategic vision for simulation, meaning that when included in the strategic vision, the managers would be perceived as more ready to support change.

The findings indicate that the management had not provided a written commitment to SBE (mean 1.91, SD=1.297) with a lower bound mean of 1.53 and upper bound mean of 2.4 at a 95% confidence interval. The lower bound mean score signifies that in some institutions, there were no existing documents that the management was committed to supporting the use of SBE. The upper bound limit shows that in other institutions, commitment exists, but little is documented. There was no relationship between the defined need and support for change and the availability of a written commitment to SBE.

The results showed little commitment from the management to provide funding to support SBE (mean=2.20, SD=1.222) with a lower bound mean of 1.83 and an upper bound of 2.56 at a 95% confidence interval. The finding indicates an urgent need to prioritise sourcing funding to support the commitment to change.

The need for promoting SBE based on current evidence, standards and guidelines was also lacking (mean=2.93, SD=1.340) with a lower bound mean=1.98 and upper bound mean of

2.54, meaning currently, simulation is not entirely based on evidence and standards of simulation practices in the nursing education institutions.

Table 5.12: State of Readiness to define the need and support for change (N=46)

Criteria	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
To what extent are innovation, experiential learning, and quality student experiences clearly described as central to the mission and philosophy of your institution?	3.57	1.068	.157	3.25	3.88
To what extent has your organisation **clearly defined the need** to consider simulation-based education (SBE)	3.04	1.316	.194	2.65	3.43
To what extent has management within your organisation communicated a **clear strategic vision** for SBE?	2.39	1.325	.195	2.00	2.78
To what extent has the management within your organisation provided a **written commitment** to SBE?	1.91	1.297	.191	1.53	2.30
To what extent have management within your organisation provided **funding** to support the commitment to SBE?	2.20	1.222	.180	1.83	2.56
To what extent does your organisation promote **the need for SBE based on current evidence, standards, and guidelines**?	2.93	1.340	.198	2.54	3.33
To what extent is SBE currently used as a teaching modality in your institution?	3.52	1.005	.148	3.22	3.82
To what extent have the educators you work with **articulated a need for SBE integration into the curriculum?**	3.91	1.092	.161	3.59	4.24
To what extent have the educators in your institution **verbalised a commitment to** SBE integration into the curriculum?	3.43	1.223	.180	3.07	3.80

5.3.4.1 Relationships between defined need and support for change variables

A Pearson's correlation test was performed to assess if there were relationships between the defined need and support for change variables. The results shown in Table 5.13 indicate that a positive relationship exists between a clearly defined need to consider SBE and the communication of a clear strategic vision for SBE (r=0.691, p=0.001) and a significant relationship exists between clearly defining the need to consider SBE and written commitment to SBE (r=0.38, p=0.009), meaning when there is a written commitment to SBE, there is defined need and support for change at p≤ = 0.05. In addition, a relationship exists

between a clearly defined need to consider SBE and promoting the need for SBE based on current evidence, standards and guidelines (r=0.632, p=0.001). However, there was no relationship between clearly defining the need to consider SBE and providing funding to support the commitment to SBE (r=0.271, p=0.069).

Table 5.13: Association between defined need and support for change variables (N=46)

Variables	**Clearly defined the need to consider SBE.**	
	Pearson Correlation	**Significance**
Clearly defined the need to consider simulation-based education (SBE)	1	
Communicated a clear strategic vision for SBE	.691	0.00
Written commitment to SBE	.380	.009
Funding to support the commitment to SBE	.271	.069
Promote the need for SBE based on current evidence, standards, and guidelines	.632**	.000

**Correlation is significant at the 0.01 level (2-tailed)
** Correlation is significant at the 0.05 level (2-tailed)

5.3.4.2 State of readiness to define need and support for change within institutions

An ANOVA-one-way test was performed to determine how the educators perceived the overall state of defined need and support for change within institutions. This variable has a total item score of 45. The results showed that the institutions had an overall composite mean score of 26.7 with an SD of 7.94. The lower bound mean was 24.34, and the upper bound mean was 29.05 at a 95% confidence interval. Within the institutions, NEI-C had a better mean score that surpassed the overall composite score threshold (mean=31.9, SD=5.97) than NEI-B, with a mean of 27.33, SD=7.053 and NEI-A just at the borderline point (mean=24.62, SD=8.37). The findings indicate that more interventions are required in NEIA to increase readiness to support change in preparation to integrate simulation compared to the other institutions. The results are shown in Figure 5.4 below:

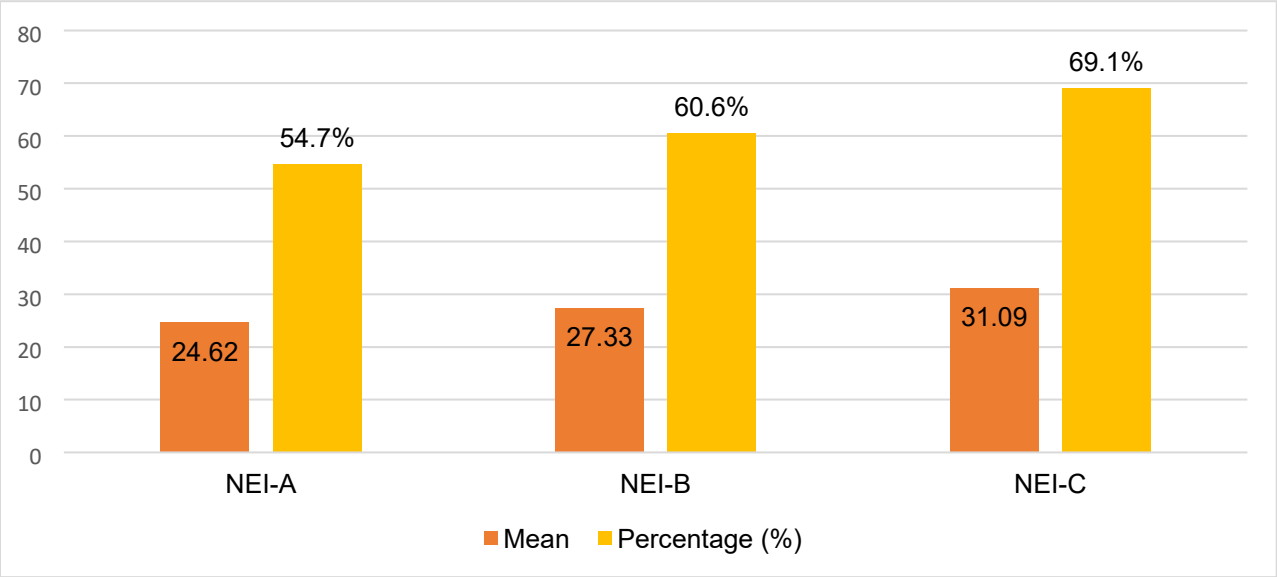


Figure 5.4: State of Readiness to Define Need and Support for Change Within the Institutions (N=46)

5.3.5 Domain B: Readiness for Culture Change

The state of readiness for culture change was assessed using nine (9) itemised criteria across the Eswatini nursing education institutions. The findings were as follows:

The participants perceived that there was a critical mass of professionals who possessed strong knowledge (mean=3.41, SD=0,979), skills (mean=3.46, SD=0.959) and positive attitude (mean=3.98, SD=0.830), with an upper limit of 4.22. Aside from the availability of staff/faculty who possess the desired knowledge, skills and attitude, they were also proficient in the use of technology (mean=3.62, SD=1.00); graduate-level researchers were available to assist in research to produce new knowledge (mean=3.41, SD=1.33), librarians were also available (mean=3.2, SD=1.16).

The findings further demonstrated that institutional managers/leaders support culture change; mean=3.22 SD=1.25. At the same time, the participants believed it was the right time to implement a culture change to support SBE, with a mean of 4.93, SD=0.463 with a lower bound of 4.78 and an upper bound mean of 5.05 at a 95% confidence interval, meaning that the educators are more ready for culture change. Additionally, the institutional

managers support the use of SBE. However, some aspects need to be improved to reach full readiness, as three criteria items scored below the study's acceptable limit of three (3):

The findings indicate that none of the institutions had credentialed or trained simulationists (mean=1.93, SD=1.083). At the same time, the NEIs perceived that a few individuals are available to model SBE best practices (mean=2.93, SD=1.26). Also, the accessibility of librarians within the NEIs to help search for evidence-based practices and related simulation resources was ranked as little with a mean of 2.91 and (SD=1.208). Therefore, immediate intervention is required as these factors could negatively impact the goal of achieving full culture change. The NEIs should prioritise getting credentialled simulation experts. There was a statistical significance difference between readiness for culture change and having individuals in the institution model SBE best practices (p=0.042) at p≤0.05. The results signify that readiness for culture change increases with the availability of credentialed personnel to model SBE best practices in the NEI. The findings are shown in Table 5.14 below:

Table 5.14: State of Readiness for Culture Change in the Eswatini NEIs (N=46)

Criteria	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
To what extent is there a critical mass of professionals who already possess strong **Knowledge**?	3.41	.979	.144	3.12	3.70
To what extent is a critical mass of professionals already possessing strong **Skills**?	3.46	.959	.141	3.17	3.74
To what extent is there a critical mass of professionals already possessing a strong **Positive Attitude**?	3.98	.830	.122	3.73	4.22
To what extent does the management **support culture change,** including the efforts required to implement and sustain SBE programme integration?	3.22	1.246	.184	2.85	3.59
To what extent are there **credentialed or trained simulationists** who mentor/coach others, including other simulationists?	1.93	1.083	.160	1.61	2.26
To what extent does your organisation have **individuals who model SBE best practices?**	2.98	1.256	.185	2.61	3.35
To what extent are staff/faculty proficient in the **use of technology**? (i.e. computer systems, AV and IT systems)	3.61	1.000	.147	3.31	3.91
To what extent are **graduate-level prepared researchers** available to assist in research to develop new knowledge appropriate to your organisation's mission?	3.41	1.326	.196	3.02	3.81

To what extent are **librarians available** within your organisation to help search for evidence-based practice and related simulation resources?	3.20	1.167	.172	2.85	3.54
To what extent are your **librarians accessed** to search for evidence-based practice and related simulation resources?	2.91	1.208	.178	2.55	3.27
To what extent do you believe **now is the right time** to implement a culture change to support SBE?	4.91	.463	.068	4.78	5.05

5.3.5.1 State of Readiness for Culture Change within the Institutions

This variable has a total item score of 55. The composite mean score of the institutions was 36.7, SD=6.88, with a lower bound mean of 34.7 and upper bound of 38.7 at a 95% confidence interval. The findings shown in Figure 5.5 indicate NEI-C is at a better state of readiness regarding implementing culture change with a mean score of 39.45, followed by NEI-B and least NEI-A with 38.44 and 34.92, respectively. The results indicate that educators in government-owned institutions perceive a low state of readiness for culture change compared to privately owned institutions.

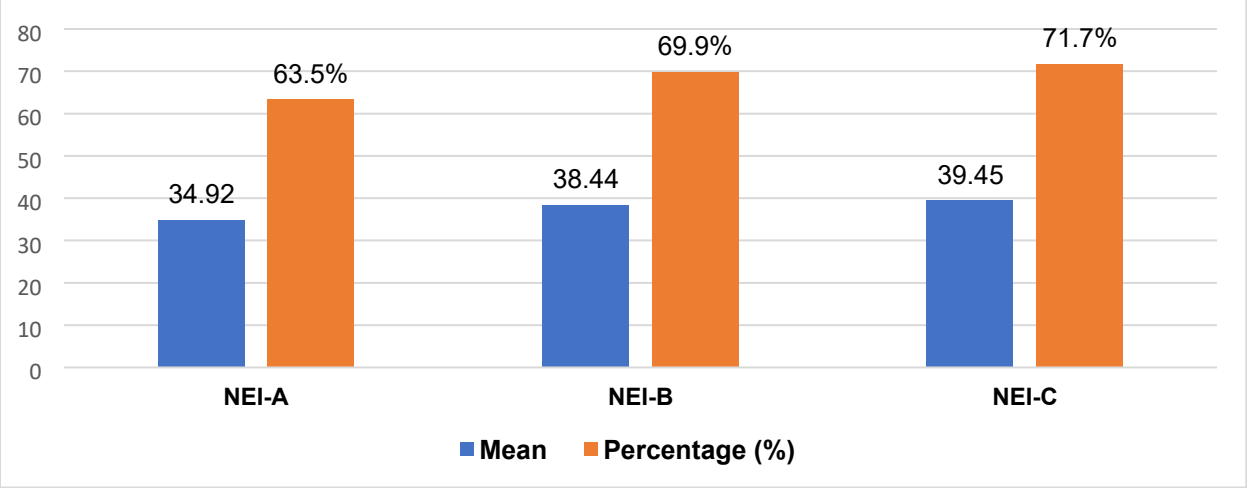


Figure 5.5: State of Readiness for Culture Change Within the Institution (N=46)

5.3.6 Domain C: Time, Personnel, and Resource Readiness

This domain assesses the state to which the institutional culture supports changes related to allocating time and the human and material resources required to integrate simulation-based education (Foisy-Doll and Leighton, 2017a). This domain comprises four (4) questions with multiple sub-questions; results are presented in Table 5.15:

Fiscal resources available to support SBE: The findings indicate that there is little support available to meet the fiscal need for the required human personnel (mean=2.7, SD=1.051), release time to lead the integration of SBE (mean=2.8, SD=1.025), development of physical learning spaces (mean=2.65, SD=1.016) and procurement of equipment (mean=2.41, SD=0.123). The findings indicate a gap regarding the institutional readiness to effect changes in the culture to support SBE due to fiscal constraints.

Access to quality technology (computers, audio-visual equipment): The findings indicate little access to quality technology in the institutions (mean=2.80, SD=0.86). This finding suggests that the current simulation laboratories are under-resourced, impacting the simulation-based education delivery systems.

Support available to learn and manage technologies: The results show that little support is available to learn and manage technologies (mean=2.96, SD=0.98). The findings reflect that a few support staff are available to teach educators and assist in managing institutional technologies.

Existing simulation champions among (management, educators, clinicians, technology specialists and administrative assistance and support staff): Simulation champions in the institutions were only found among the educators (mean=3.24, SD=1.139). The management had a mean score of 2.11 (SD=1.140); clinicians (mean= 2.48, SD=1.225); technologies specialists (mean= 2.37, SD= 1.236), while the administrative assistants and support staff had a mean score of 2.07 (SD=1.020). The findings signify a need to increase the involvement of other faculty members to advance simulation use in the institutions. At the same time, findings reflect challenges in effecting a culture that supports SBE use due to the limited involvement of other faculty members.

Table 5.15: State of Readiness to Allocate Time, Personnel, and Resource (N=46)

Criteria	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
To what extent are fiscal resources available to support SBE in the following areas: **Human resources?**	2.70	1.051	.155	2.38	3.01
To what extent are fiscal resources available to support SBE in the following areas**: Education**?	2.76	1.058	.156	2.45	3.08
To what extent are fiscal resources available to support SBE in the following areas: **Release time to lead the integration of SBE**?	2.80	1.025	.151	2.50	3.11
To what extent are fiscal resources available to support SBE in the following areas: **Development of physical learning spaces**?	2.65	1.016	.150	2.35	2.95
To what extent are fiscal resources available to support SBE in the following areas: **Equipment**?	2.41	.832	.123	2.17	2.66
To what extent do employees in your institution have access to **quality technology**, including computers, audio-visual equipment, and other institutional technologies?	2.80	.859	.127	2.55	3.06
To what extent is **support available** to learn and manage technologies that support education?	2.96	.918	.135	2.68	3.23
To what extent are there existing simulation champions (people who will go the extra mile to advance simulation) in the current environment among: **Management**?	2.11	1.140	.168	1.77	2.45
To what extent are there existing simulation champions (people who will go the extra mile to advance simulation) in the current environment among: **Clinicians**?	2.48	1.225	.181	2.11	2.84
To what extent are there existing simulation champions (people who will go the extra mile to advance simulation) in the current environment among: **Educators**?	3.24	1.139	.168	2.90	3.58
To what extent are there existing simulation champions (people who will go the extra mile to advance simulation) in the current environment among: **Technology specialists**?	2.37	1.236	.182	2.00	2.74
To what extent are there existing simulation champions (people who will go the extra mile to advance simulation) in the current environment among: **Administrative assistants and support staff**?	2.07	1.020	.150	1.76	2.37

5.3.6.1 State of Readiness to Allocate Time, Personnel and Resources Readiness within the Institutions

The total item score for this variable is 60. The composite mean score for all the institutions was 30.87, SD=6.87. The lower bound mean totalled 28.8, and the upper bound mean was 32.9 at a 95% confidence interval. NEI-A had the lowest mean score of 29.73 (SD=5.81), followed by NEI-C with a mean score of 31.35 (SD=7.38), and NEI-B obtained a mean score of 33.56 (SD=8.9). The findings suggest a state of constrained readiness to allocate time, personnel and resources needed to support SBE integration due to limited fiscal resources. Results are displayed in Figure 5.6 below:

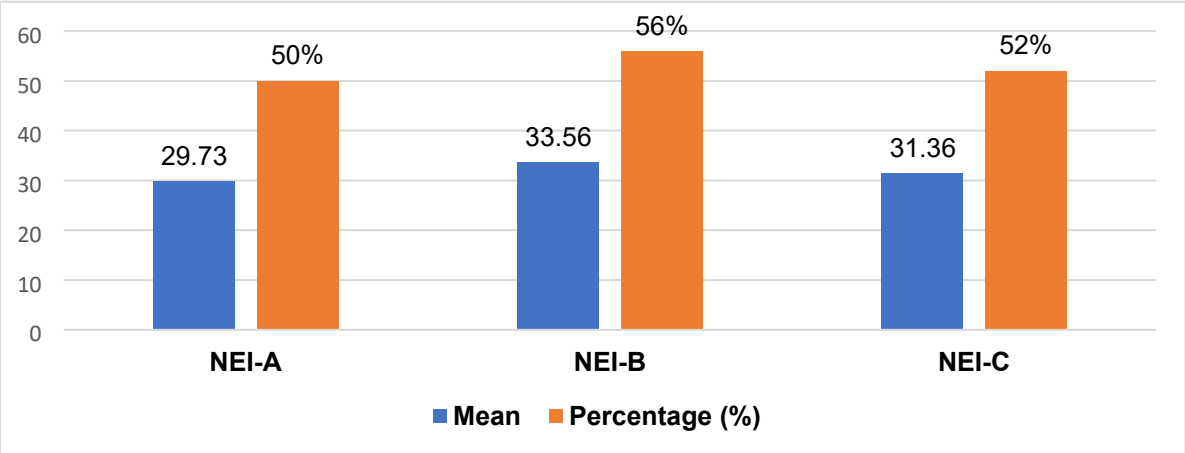


Figure 5.6: State of Readiness to Allocate Time, Personnel and Resources within the Institutions

5.3.7 Domain D: Sustainability Practices to Embed Culture

The variable of sustainability practices to embed culture assesses the educational practices inherent in ensuring a successful and sustainable simulation programme instead of policies that concern ecological and socio-economical practices (Foisy-Doll and Leighton, 2017a). The findings regarding the extent to which Eswatini nursing education institutions have embraced the sustainability practices needed to embed culture change are described below.

The results showed that measurements and sharing of outcomes were part of the institutions' culture (mean=3.04, SD=1.032) and that nurse educators are part of the decision-makers regarding SBE (mean=3.65, SD=1.25). However, clinicians involved in decisions regarding

simulation yielded a mean score of 2.74, SD=1.37, and management had a mean score of 2.91, SD=1.443. These findings indicate that the institutions partially embrace sustainability practices for embedding simulation since other key decision-makers are less involved. The findings suggest a need to review existing educational practices and accommodate other members who should be involved when planning to integrate simulation to sustain the change. The findings are shown in Table 5.16 below:

Table 5.16: State of readiness to embrace sustainability practices to embed culture Eswatini NEIs (N=46)

Criteria	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
To what extent is the measurement and sharing of outcomes part of the culture of the organisation where you work?	3.04	1.032	.152	2.74	3.35
To what extent are decisions regarding SBE influenced by: Clinicians	2.74	1.373	.202	2.33	3.15
To what extent are decisions regarding SBE influenced by: Educators	3.65	1.251	.184	3.28	4.02
To what extent are decisions regarding SBE influenced by: Management	2.91	1.443	.213	2.48	3.34

5.3.7.1 State of embracing sustainability practices to embed culture with institutions

Figure 5.8 below shows the state at which each nursing education institution had embraced the educational practices that sustain culture change. The total item score for this variable is 20. The overall composite mean score was (mean=11.87, SD=3.63) with a lower bound mean of 10.979 and an upper bound mean of 12.95, reflecting a lower state of implementing sustainability practices to embed culture. NEI-C showed a slightly better state (mean=13.18, SD=3.82) than the other institutions, with NEI-B having a mean of 11.67 and NEI-A with a mean of 11.8, suggesting that an intervention is required to enhance simulation sustainability.

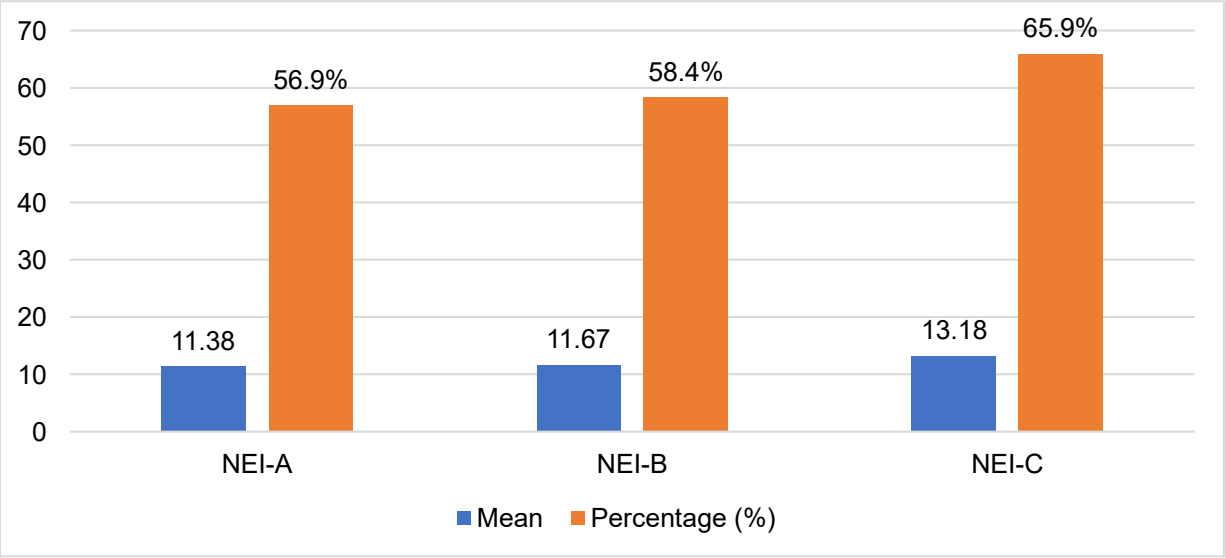


Figure 5.7: State of embracing sustainability practices to embed culture within institutions (N=46)

5.3.8 The Perceived state of readiness to Integrate Simulation within the variables/domains

The summary of impression is interpreted as follows based on Foisy-Doll and Leighton's (2017a) guidebook, a score of 1=Not ready, 2=Getting ready, 3=Been ready but not acting, 4=Ready to start to act and 5 = Past ready and into action planning.

Figure 5.8 below displays the overall composite mean score (summary of impression) for each of the four (4) variables/domains: defined need and support for change, readiness for culture change, time, personnel and resources readiness and sustainability practice to embed culture as perceived by the nurse educators in Eswatini. The composite mean score informs about the state in which simulation is used in the setting. In this study, the overall mean score was 3.0.

Two of the domains, the defined need and support for change and sustainability practices to embed culture, had an equal overall mean score of 3.0. The domain readiness for culture yielded a slightly high mean score of 3.4, while the domain for time, personnel and resources obtained a mean score of 2.6. The findings indicate that the institutions were ready but not actively integrating simulation into the Bachelor of Nursing Science programme. However,

interventions are needed to reach readiness and start the integration process, and much effort is needed in allocating time, personnel, and resources to ensure readiness.

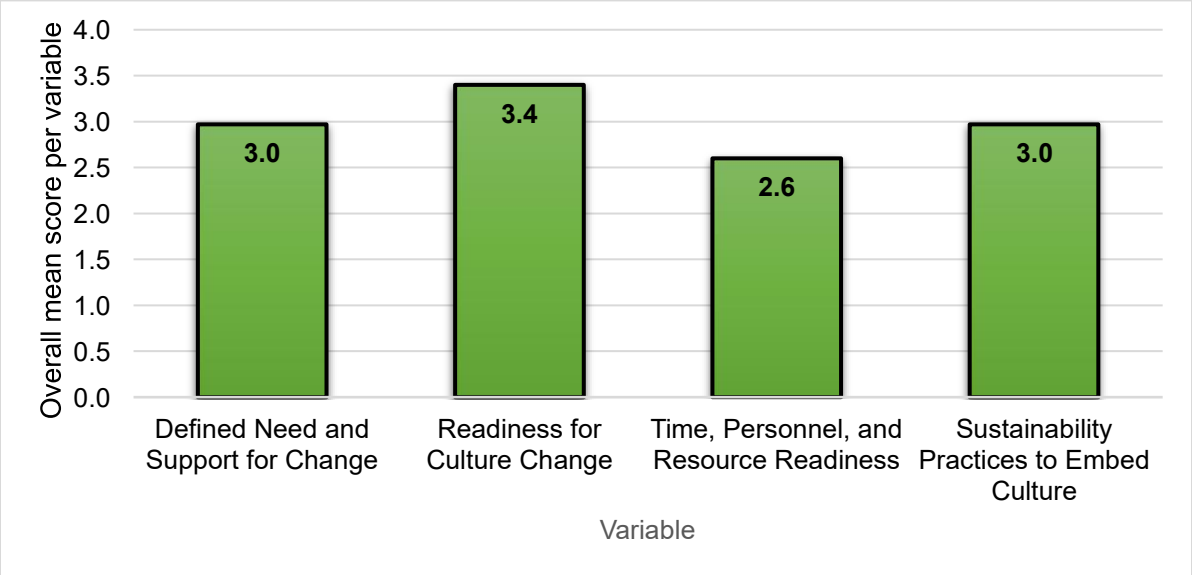


Figure 5.8: Composite mean score for each variable/domain (N=46)

5.3.9 Overall Score of Readiness Within the Nursing Education Institutions

Foisy-Doll and Leighton (2017a) stated that the lowest possible overall score is 36, and the highest is 180. However, any score above 144 indicates a very ready status for SBE (see Table 5.11 above). None of the institutions was very ready for SBE: NEI-C (115.1) and NEIB (111), meaning they were slightly ready because they were barely within the moderately ready (109-144) status. In comparison, NEI-A had a mean score of 100.6, indicating a somewhat (73-108) ready status and more interventions are required to improve its state of institutional culture and readiness for simulation use across the four domains, mainly time, personnel and resource readiness; defined need and support for change (management support); sustainability practices to embed culture and readiness and readiness for culture change.

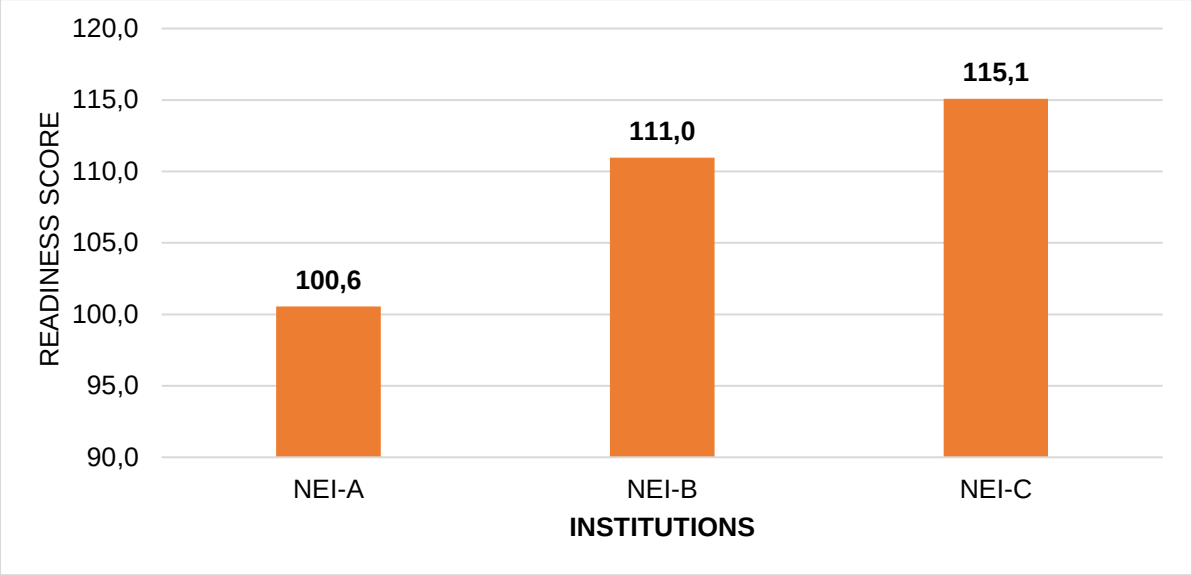


Figure 5.9: Overall score of readiness for simulation use within the institutions

5.3.10 Overall state of readiness for Simulation in Eswatini NEIs

The results showed that the Eswatini nursing education institutions were somewhat ready (106.1); interventions would be required to reach a full-scale readiness state, with a score of 144, according to Foisy-Doll and Leighton (2017a). The overall mean score for the Eswatini nursing education institution is shown in Table 5.17 below:

Table 5.17: Overall state of readiness for simulation in Eswatini nursing education institutions (N=46)

Variable/Domain	**Mean**
Defined Need and Support for Change	26.70
Readiness for Culture Change	36.70
Time, Personnel and Resource Readiness	30.87
Sustainability Practices to Embed Culture	11.87
Overall Mean Score for Eswatini NEIs	**=106.1 (somewhat)**
Key: **None=0-36 | A little=37-72 | Somewhat=73-108 | Moderately=109-144 | Very much=145-180**	

5.4 DISCUSSION OF FINDINGS

5.4.1 Introduction

This section discusses the findings that emerged from survey studies A and B regarding the state of simulation use in Eswatini nursing education institutions. The findings are discussed separately.

5.4.2 Instructor/Staff Needs

The standard regarding instructor/staff needs is that a skills laboratory should be operated by a team of educators/instructors/facilitators knowledgeable and skilled in simulation activities and objectives (Riabtseva et al., 2015).

Findings from this study showed that the Eswatini nursing education institutions have limited staff members (28%) designated to operate the simulation centres/laboratories. Most of the NEIs had no designated faculty member to coordinate simulation-based education activities, coupled with a poor ratio of lecturers to students. The availability of a simulation coordinator, also called a faculty champion (Nehring et al., 2013), is essential in an institution. The identified missing personnel assist with continuing faculty development, support educators/lecturers throughout the simulation experience processes and get faculty and management buy-in to simulation (Nehring et al., 2013; van Vuuren et al., 2018; Sawaya et al., 2021). Livesay and Lawrence (2018), in their study on staff perception of the sustainability of simulation in a programme, stated that the lack of designated coordinators compromises the quality and sustainability of SBE. Consistent with the latter were Nehring et al. (2013), who also cited it as a barrier to advancing simulation learning in academia. Currently, the NEIs simulation laboratories are manned by technologists who assist with equipment monitoring and organisation of the laboratory; they, too, were not equipped with simulation techniques and technology.

Another area that requires intervention in Eswatini NEIs is the training of staff members on simulation pedagogies. None of the educators was educated in writing and implementing scenarios, planning and evaluating simulation, integrating simulation into a curriculum, using and preparing standardised patients, and using computerised and non-computerised

mannequins and high-fidelity equipment. The literature emphasises the importance of educating academic staff to provide quality education (Waxman and Telles, 2009; Nehring, Hughes and Greenwell, 2013; Jeffries et al., 2015; Nestel et al., 2016; Beroz, 2017; Bryant et al., 2020).

Concerns about the lack of training on simulation aspects among academic staff have been reported in various settings within the African context, including South Africa (van Vuuren et al., 2018; Swart et al., 2019); Lesotho (Moabi and Mtshali, 2021); Tanzania and Madagascar (Tjoflåt et al., 2021). Moreover, the lack of trained educators has been identified along with other factors, such as lack of funding for resources, equipment and designated time for integrating simulation, as major hindrances to the successful use of simulation in South Africa (Swart et al., 2019; Moabi and Mtshali, 2021). A clearly defined commitment to SBE from institutional managers is proposed to overcome these barriers (Swart et al., 2019; Moabi and Mtshali, 2021).

5.4.3 Financial and Resource Planning

Riabtseva et al. (2015) stated that financial and resource plans are integral to a simulation centre's sustainability. The study's findings revealed gaps in the availability of financial plans for funding one-time costs/investments and recurrent SBE resources. The institutions were at 54% regarding the availability of financial and resource planning for simulation-based education.

One-time costs for financing simulation resources, such as building premises, mannequins, furniture, and audio/video equipment, were partially made or planned for in this study. The findings revealed that the NEIs were still at basic levels regarding simulation equipment and infrastructure development. Also identified was that none of the NEIs had made or reserved funds to purchase simulation scenario software or support the initial training of educators/instructors/trainers. These findings may also suggest a lack of awareness of what resources should be funded, an issue of fiscal constraints, or both.

It is not uncommon for NEIs to operate where one-time costs towards financing the establishment of a simulation centre/laboratory and needed resources were unavailable or partially made. Owen (2016), who focused on detailing the history of simulation in healthcare

education, stated that the lack of funding for such educational resources had been a long-lasting issue dating from 100 to 150 years ago, and it continues to prevail in contemporary times. Gaba (2004) concurs with the latter, stating that investing in quality healthcare education has never been a priority compared to patient safety. However, patient safety can only be ensured by directing national funds to finance healthcare education (Gaba, 2004).

In the Mclellan et al. (2020) study, students were concerned about learning in an underresourced simulation laboratory yet expected to develop the relevant nursing competencies. Financing contemporary simulation-based education resources has been linked with alarming costs (Lavoie and Clarke, 2018); they have been identified as hindering factors (Nestel et al., 2019). However, long-term investments for financing institutional-based education are needed, given that didactic learning alone is less beneficial to students (Mclellan et al., 2020). While fiscal resource issues worry most educational institutions, Seropian et al. (2004) provided a profound, cost-effective strategy. It involved sharing the costs of infrastructure and equipment (building a simulation centre) with other NEIs, healthcare disciplines and the healthcare system (Michael A Seropian et al., 2004). Lavoie and Clarke's (2018) study also provides data on how simulation can be offered at affordable costs.

5.4.4 Infrastructure and Equipment

Riabtseva et al. (2015) stated that infrastructure and equipment are essential for successful simulation learning. Forrest and McKimm (2019) echoed the claim that resources and equipment significantly influence academic teams' performance. A challenge exists in Eswatini nursing institutions as findings showed some inadequacies with the available physical infrastructure and equipment for simulation learning.

Other studies, such as those of Fritz et al. (2020) and Angelina et al. (2021), have attributed the decline in healthcare professionals' competencies for obstetric emergencies to the lack of educational resources coupled with limited clinical supervision. Nevertheless, inadequate simulation infrastructure and equipment is still an ongoing concern for nursing and midwifery institutions within and outside Africa (Beroz, 2017; Bvumbwe and Mtshali, 2018; Riaz, 2019; Bogren et al., 2021). In comparison, the identified barrier is less common in Western

countries as the financial support often comes from their national government (Nestel et al., 2017).

Some of the Eswatini nursing education simulation laboratories' physical structure lacked certain critical design features such as (a) an autonomous entrance door, (b) a debriefing room, (c) a meeting room, (d) a standardised patients' preparation room, and in some (e) washrooms, adequate lighting, suction system, and water supply to name a few. Forrest and McKimm (2019) described three primary compartments of simulation laboratories: spaces for people, such as a debriefing room; a simulated environment, meeting and skills rooms; and the technical space, a room for storing audio-visual equipment. All these features are lacking in the existing simulation learning environment in Eswatini NEIs, thus calling for upgrading.

The equipment was fairly (63%) available but with some significant limitations. The nursing education institutions' simulation laboratories were functioning without critical care mannequins, simulation scenario software and nasal cannula for CPAP therapy. Some barely had monitors and obstetric/midwifery mannequins. In addition, they lacked technical equipment such as audio-visual systems, which Forrest and McKimm (2019) claimed to be the most crucial instructional resource in a simulation laboratory. The identified technical equipment enable educators and instructors to monitor and observe students' performances, "record, remotely control and stream scenarios and then replay them during the debrief" (Forrest and McKimm, 2019, p:29).

5.4.5 Nurse Educators' Views on the State of Simulation Use in Eswatini NEIs

Gaps were identified across the four domains/variables covered in the SCORS tool when assessing the state of simulation use in Eswatini among nurse educators.

5.4.6 Defined Need and Support for Change

The Eswatini NEIs, to some extent, have defined the need to integrate simulation (3.0 mean score), and there are identifiable facilitators for supporting change. The findings showed that innovation, experiential learning, and quality student experiences were integral to the mission and philosophy of the institutions. The highlighted aspect means that simulation is

part of the institutional programme goals. Having such in the mission and philosophy of the institution is regarded as essential for the successful implementation of SBE (Taplay et al., 2014; INACSL Standards Committee, 2016d; Schneidereith et al., 2020; Moabi and Mtshali, 2021). Taplay et al. (2014) further stated that advancing toward change could be supported when the request is directed toward meeting the programme goals that are part of the institution's mission and vision.

Understanding the extent of defined need and support for change in an institution requires assessing how the employees feel about SBE (Akhtar-Danesh et al., 2009; Foisy-Doll and Leighton, 2017a). Many factors, including the educators' views and collegial commitment to SBE, remain crucial in achieving change and support for simulation use (Adamson, 2010; Livesay and Lawrence, 2018). Such views were apparent in this study; findings showed that the participants were committed to integrating SBE into the curriculum. In addition, all the participants stated that simulation-based education is used as a teaching modality in their NEIs. These findings demonstrate that educators recognise the need for integrating SBE in the Eswatini NEIs; however, Adamson (2010) expressed that educators also require support from management.

The lack of support from management was perceived in this study. There was an unavailability of (a) a clear strategic vision for SBE, (b) a written commitment to SBE, and (c) funding to support the commitment to SBE. The lack of shared goals and vision leads to a failure to sustain simulation-based education at effective levels (Leighton et al., 2020). Furthermore, Taplay et al. (2014) concluded that it is only when simulation-based education is part of the institution's strategic vision that educators can execute plans to integrate it into the curriculum. Supporting evidence that echoes the above submission revealed that the lack of organisational or leadership support hinders simulation integration, effective use and advancement (Motola et al., 2013; Nehring et al., 2013; Taplay et al., 2014, 2015; Munangatire and Naidoo, 2017; Schneidereith et al., 2020).
Bank et al. (2017) stated that leaders are mandated to drive change.

5.4.7 Readiness for culture change

This study revealed that the Eswatini institutions were slightly better than average (overall mean score, 3.4) regarding readiness for culture change. There were academic staff members with SBE knowledge (mean score=3.41), skills (mean score=3.46), and positive attitudes (mean score=3.98) (KSA). The Eswatini NEIs had professionals who were ready to support culture change. Schneidereith et al. (2020) said those qualities (KSA) are required to initiate cultural shift and spearhead change. However, interventions are still needed to reach full-scale readiness in the Eswatini NEIs, given the borderline mean score for those possessing simulation knowledge and skills. Secondly, none received formal training from a recognised simulation programme, and numerous training needs were noted in survey A results, as well.

This study's participants (nurse educators) had a higher positive attitude. The attitude signifies that most Eswatini nurse educators were likely to support change despite existing barriers. Akhtar-Danesh et al. (2009) described individuals with a positive attitude as influencers of simulation use. The staff's attitude also informs about their desires and what a group would strive for (Taplay et al., 2014). In comparison, negativity hinders readiness; van Wyk et al. (2020) reported that students' negative attitudes prevented them from embracing simulation as an educational strategy for delivering interprofessional education and was intertwined with a lack of preparedness.

The Eswatini nurse educators demonstrated a positive attitude towards SBE (mean score=3.98; however, the lack of credentials or trained simulation experts (mean score=1.98) limits the readiness for culture change. A similar problem has been reported in Awogbemila's (2018) research work across five departments in one Faculty of Health Science in South Africa. The identified gap compromises the advancement of simulation use due to the absence of mentors to support and promote best simulation practices (Foisy-Doll and Leighton, 2017a).

On the other hand, a shortage of staff who can use technology has been associated with limitations of using advanced simulation technology (human simulators) (Durham and Alden, 2008) and rigidity to change due to fear of using technology (Akhtar-Danesh et al., 2009;

Thurling, 2017). The study findings showed that Eswatini nurse educators were somewhat proficient with the use of technology (computer systems, AV and IT systems) (mean score=3.61). Therefore, this finding signifies an existing strength among the Eswatini educators, which may be useful in simulation technologies.

5.4.8 Time, personnel, and resource readiness

The findings of this study showed a lack of readiness regarding commitment to allocate time, personnel and resources (mean score=2.6); the majority of the assessed elements were below the accepted mean score of 3 out of 5. Factors include (a) a lack of fiscal resources to support simulation personnel (mean score=2.70), education of educators (mean score=2.76), release time (2.80) to lead the integration of SBE, and the development of physical learning spaces (mean score=2.65) and equipment (mean score=2.41). (b) lack of access to quality technology (mean score=2.80), (c) absence of support available to learn and manage technologies that support education (mean score=2.96), (d) lack of simulation champions among the management (mean score=2.11), clinicians (mean score=2.48), technology specialists (mean score=2.37), administrative assistants, and support staff (mean score=2.07.

The findings are consistent with other studies challenged by the lack of fiscal resources (van Vuuren et al., 2018; Swart et al., 2019; Moabi and Mtshali, 2021). The institutional decision-makers and regional leaders are responsible for ensuring the availability of needed resources (Seropian et al., 2004; Riabtseva et al., 2015; Taplay et al., 2015). Seropian et al. (2004) emphasise the importance of having a sound vision and business plan to encourage decision-makers' buy-in. However, the issues of the lack of trained educators in simulation pedagogies are attributed to not only the lack of financial support but also protected time for faculty development (Fox-Young et al., 2012; Al-Ghareeb and Cooper, 2016; Mulli et al., 2022), negative attitude towards simulation, fear of using technology and increased workload (Al-Ghareeb and Cooper, 2016).

The participants (nurse educators) in this study verbalised that they possessed technology proficiency; however, their NEIs lacked access to quality technology (computers, audiovisual equipment) and support for learning and managing the technologies. Regarding the

highlighted needs, Guise et al. (2012) explained that knowledge and skills are not the only critical factors in sustaining simulation-based education but also motivation and ongoing support to use technology.

Technology has been accommodated and used to deliver theoretical content in nursing educational systems (Jeffries, 2005b; Damewood, 2016; Tseng et al., 2021). Some simulation aspects use computer technology to enhance the delivery of complex clinical experiences (Faulcon, 2015). Furthermore, issues around educational technology have been debated in the literature, some saying that the lack of technological support is a typical challenge that hinders the uptake of technological-based education (Durham and Alden, 2008; Akhtar-Danesh et al., 2009). Further, Akhtar-Danesh et al. (2009) argued that a lack of technological resources encourages falling back to traditional delivery methods.

Another gap identified when assessing the state of simulation-based education in the Eswatini NEIs was the nonexistence of simulation champions among management, clinicians, technology specialists, administrative assistants, and support staff. Moabi and Mtshali (2021) reported a similar concern in their study. They concluded that it reflected a lack of readiness to integrate SBE (Moabi and Mtshali, 2021). However, having such personnel (a) aligns with best practices for adopting and integrating robust SBE in any given setting (Leighton, Foisy-Doll and Gilbert, 2018; Edward and Chukwuka, 2020; Baayd et al., 2023); (b) provide leadership in SBE use (Gaberson et al., 2015). Lastly, (c) simulation champions are essential for the sustainability of the SBE programme (Forrest, McKimm and Edgar, 2013).

5.4.9 Sustainability Practices to Embed a Simulation Culture

Sustainability practices were not fully embraced (mean score=3.0) to model a simulation culture. Practices for sharing outcomes were minimally done (mean score=3.04). Also, educators were the only ones influencing decisions regarding SBE use (mean score=3.65), while clinicians (mean score 2.74) and the administration (mean score=2.91) were not yet fully participating. The study showed a weakness in employing collaborative practices that sustain simulation. Sustainability concerns many institutions (Taplay et al., 2014; Foisy-Doll and Leighton, 2017a), and such has been attributed to the lack of planning, thus leading to

failure to benefit from simulation-based education (Leighton et al., 2020). Moreover, Foisy-Doll and Leighton (2017a) alluded that it requires embracing inter-institutional collaboration and transdisciplinary actions to expand access to SBE resources. Embracing sustainable practices includes availing resources for simulation learning by collaborating with other professionals within and outside healthcare professions, such as those engaged in training staff on medical emergency skills (Riabtseva et al., 2015; Foisy-Doll and Leighton, 2017a).

5.5 CONCLUSION

This chapter described the state of simulation use in Eswatini to inform the next phase of the study. The next chapter focuses on the development of the framework for integrating simulation into the Bachelor of Nursing Science in Eswatini.

CHAPTER 6: DEVELOPMENT OF THE FRAMEWORK FOR INTEGRATING SIMULATION INTO THE BACHELOR OF NURSING SCIENCE PROGRAMME

6.1 INTRODUCTION

This chapter is the third phase of the main study. Phase three aimed to develop a framework for integrating simulation into the Bachelor of Nursing Science programme in Eswatini. An iterative research methodology was used to address the study's objective. The research method enabled the researcher to solicit opinions from simulation experts. Two theoretical frameworks: the organisational elements that shape the simulation in nursing (OESSN) model for adopting and integrating simulation (Taplay et al., 2014) and the NLN Jeffries Simulation Theoretical model (Jeffries, Rodgers and Adamson, 2015; Jeffries, 2021) guided the experts regarding the concepts to consider in the process of integrating simulation. The data source used to answer the research problem emerged from integrating the meta-inferences drawn from phase 1 and 2 findings. The data matrix is presented in Table 6.1 below.

This chapter discusses the Eswatini context background using the conclusions drawn in phase 2. Subsequent sections present the lessons learned from the scoping review and survey studies (phase 1 and 2 findings) and, lastly, the development of the framework.

6.2 BACKGROUND

This study's findings demonstrated that all the institutions are somewhat using simulation as a teaching modality (mean score=3.52) and it is central to the mission and philosophy of the NEIs (mean score=3.57). However, some nurse educators were untrained in the SBE implementation process, with only 28% having been trained in some aspects. Factors associated with this current state are the lack of financial investment allocated for educators' training, a clearly defined need for SBE in the strategic vision, management support and commitment to SBE, equipment resources and release time. These factors have been reported in the literature (Adamson, 2010; van Vuuren, Seekoe and Goon, 2018; Swart, Duys and Hauser, 2019). The training of nurse educators on SBE is required to facilitate experiential learning (Bryant et al., 2020). Therefore, there is a need for training educators

on simulation pedagogy to ensure that students gain quality learning experiences as envisaged in the mission and philosophy of the institutions.

This study's findings revealed that nurse educators influenced most decisions concerning SBE compared to management (heads of schools, deans, heads of departments and directors) and clinicians (stakeholders), suggesting a lack of clearly defined need to support culture change in the institutions. However, this teaching modality's sustainability requires the buy-in of clinicians and management, given that simulation is a clinical practice component and managers influence organisational culture change (Taplay et al., 2014; Bryant et al., 2020; Ferguson et al., 2020; Moabi and Mtshali, 2021). Furthermore, managers influence the capacity to sustain SBE practices and embeddedness within a nursing education institution (Taplay et al., 2014); however, such support is constantly challenged by "the lack of strategic leadership and buy-in" (Ferguson et al., 2020, p. 922).

The findings revealed a significant lack of credentialed (trained and certified) simulation personnel (mean score 1.93 out of 5) and simulation champions, particularly among the management (mean score=2.11), clinicians (mean score=2.48), technology specialists (mean score=2.37) and administrative and support staff (mean score 2.07), thus missing an aspect useful in operationalising SBE. These personnel have various tasks, including promoting culture change, initiating faculty development opportunities for nurse educators, and modelling best practices for clinical simulation learning processes (Foisy-Doll and Leighton, 2017c, 2017a; Leighton et al., 2020; Schneidereith, Leighton and Foisy-Doll, 2020).

The nurse educators were all at the graduate level and involved in clinical teaching; however, they had not advocated for librarians who could assist with access to evidence-based practice and resources related to simulation learning. The literature shows that simulation-based education is evolving, and various organisations and centres have developed learning resources for supporting nurse educators with the simulation processes (Hayden et al., 2014) and updated standards (Bryant et al., 2020).

Infrastructure and equipment resources were other areas requiring attention in this study setting, indicating that SBE education is marginally used. In South Africa, some nursing education institutions, with resources suitable for a college status, upgraded their libraries, computer laboratories, simulation/skills laboratories, and classrooms to meet higher education standards. Further upgrades included reviewing the curriculum to incorporate innovative teaching and learning practices (Zwane and Mtshali, 2019). Eswatini nursing education institutions share the same background as they evolved from institutions offering diplomas instead of degree qualifications.

6.3 LESSONS LEARNED

Table 6.1 below shows the lessons learned from the scoping review and survey studies; information includes the ideal and reality (challenges) situations.

Table 6.1: Lessons Learned from a Scoping Review and Survey Study

Sub-component	Scoping review	Survey A: Simulation Centres/Laboratories' Audit	Survey B: Simulation Culture Organisational Readiness Survey
	Component A: Human resources (personnel) for ensuring sustainable simulation-based education include:		
	• Nurse educators who are simulation champions.	• A simulation coordinator (champion) among academic staff to direct simulation activities. • An adequate ratio of educators to students to facilitate learning during simulation sessions. • Simulation technicians are needed to manage simulation equipment and provide technical support.	• Simulation champions among educators, management, clinicians, technology specialists, management assistants, and support staff to support and ensure SBE readiness. • Credentialed or trained simulation specialists who mentor/coach others, including other simulation experts. • Graduate-level prepared researchers to assist in searching for new knowledge appropriate to the NEI's mission. • Librarians should be available in the institution to help search for evidence-based practices and related simulation resources. • A critical mass of educators with strong knowledge, skills, and attitudes about SBE must be available in the institution. • Technicians and technologists must train the

			instructors/educators on using and managing simulation technologies.
	Existing challenges		
	N/A	• SBE activities were poorly coordinated due to a lack of a designated academic staff member for this task. • The simulation centres had challenges facilitating simulation learning experiences during sessions due to fewer educators than students.	• The nurse educators who used simulation as a teaching modality were not supported due to the absence of simulation experts or trained individuals who can provide mentorship and model SBE best practices. • There is a possibility that the development of simulation scenarios is not informed by current evidence and practices due to a shortage of librarians to assist in searching for such knowledge. • There is a possibility that SBE is not based on current evidence, standards, and guidelines because such practice is not widely promoted as part of the institution's culture. • The commitment to SBE is challenged by the almost non-existence of simulation champions among the management, clinicians, technology specialists, management assistants, and support staff. • There is a high risk of poor uptake or use of simulation technologies due to the limited number of technicians available to support

			educators in learning how the resources are used and managed.
	Component B: Lecturers/Nurse Educators'/Academic Staff Preparation		
Educators' Training Needs and Roles and Responsibilities	• It is challenging to integrate simulation-based education without formal training. • Faculty needs to be trained on simulation use regardless of any field of speciality (e.g., midwifery lecturers). Aspects of the training include knowledge and skills on how to: — Develop, implement, and integrate simulation into a nursing curriculum. — Facilitate simulation learning experiences. — Plan and facilitate pre-briefing sessions. — Conduct debriefing, provide feedback, and evaluate student learning and simulation quality. — Operate the simulation technologies — mannequins. — Develop simulation scenarios. • Simulation can be realised as a teaching modality through formal training. • Nurse educators are responsible for preparing, structuring, and administering student learning, guiding and supporting them during pre-briefing, scenario, and debriefing periods: — Develop and provide pre-simulation lessons using a variety of preparatory learning activities. — Establish a psychologically safe learning environment. — Provide logistics about the simulation experience and orient the learners to the learning space and equipment resources they will use in the scenario. — Faculty conduct a need assessment to inform the scenario. — Observe student learning and maintain an appropriate fidelity. — Evaluate and provide feedback to the learners, formative/summative.	• It is essential to have a team of instructors/nurse educators trained in SBE to facilitate simulation learning effectively. • It is essential to allocate money to support the initial training of educators. • Providing funding for skills advancement is essential to promote ongoing faculty development. • Allocating funding for subscribing to a recognised simulation organisation is vital to ensure access to current knowledge and practices. • Nurse educators must be trained to plan a simulation in order to provide comprehensive quality learning experiences and ensure effective use of the teaching strategy, — Nurse educators must be trained in implementing a scenario to prepare students for real-life clinical experiences. — Nurse educators must be trained in evaluating a simulation experience using a recognised instrument to ensure standardised teaching and learning. — Nurse educators must be trained to write simulation scenarios to ensure students gain experiential learning in responding to different patient situations and reduce the stress	• The academic staff must possess strong knowledge, skills, and a positive attitude to design, develop, integrate, evaluate, and support student learning effectively. • Staff must be proficient in using technology (computer, audio-visual, and information technology systems) to ensure readiness for culture change. • Educators need preparation to integrate SBE into the curriculum. • Educators must engage in research to discover innovative simulation practices needed to advance the quality of student clinical outcomes. • Educators need training on how to manage simulation technologies (mannequins). • Funding is necessary for supporting educators' training to advance and ensure the appropriate use of SBE. • Funding is needed to support educators' commitment to integrating SBE into the curriculum, including release time.

	— Assist learners in integrating theory into practice. — Lead the debriefing (reflection) process. — Guide and support students toward achieving the simulation experience objectives.	associated with a lack of exposure to real-life settings. — Nurse educators must receive training in developing assessment tools to ensure the availability of standardised evaluation instruments within the institution. — Nurse educators must be trained in applicable regulations, guidelines, and local protocols to ensure the provision of simulation experiences follows set standards appropriate to the programme outcomes. — Nurse educators must be trained in preparing simulation equipment for training for them to be able to select the appropriate equipment per the students' level of education and simulation experience objectives. — Nurse educators must be trained in managing equipment after the training session to ensure the proper preservation of available resources. — Nurse educators must be trained in integrating simulation into the curriculum to ensure that this pedagogy consistently guides clinical teaching and learning in the educational programme, not as a by-the-way approach. — Nurse educators must be trained to use and prepare standardised patients to provide learning experiences that capture the affective domain and basic/non-invasive technical skills. — Nurse educators must be trained to use computerised mannequins to develop clinical experiences that	

		allow students to learn and perform technical and non-technical clinical skills. — Nurse educators must be trained to use non-computerised mannequins to develop clinical knowledge and skills using low-fidelity equipment. — Nurse educators must be formally prepared to use task trainers to demonstrate low-fidelity technical skills paramount to developing foundational nursing skills. — Nurse educators must be able to use high-fidelity equipment to develop learning experiences that emulate various clinical experiences that should not be performed on patients due to safety and ethical reasons. — Nurse educators must be trained to use medium-fidelity equipment to provide technical clinical experiences using cost-effective simulation equipment. — Nurse educators must be trained on how to facilitate debriefing to ensure students develop the intended competencies and seamlessly integrate theory into practice through SBE.	
	Existing challenges		
	N/A	• There is a risk of failure to sustain simulation-based education due to the lack of investment in supporting the training of instructors or educators, budget for skill advancement, and membership subscriptions to recognised simulation organisations.	• There is a high risk that the simulation experiences planned or implemented by the educators might be of poor quality, meaning less informative due to the absence of credentialed or formally trained educators and

		• The simulation centres/laboratories lacked personnel (instructors/academic staff) that clearly understood their tasks and objectives given that there were some untrained in various aspects of simulation use, including planning and implementing a scenario, writing scenarios, integrating simulation into the curriculum, use, and preparation of standardised patients, use of computerised mannequins, use of non-computerised mannequins, use of high-fidelity equipment and use of medium-fidelity equipment. • They also lacked debriefing competencies.	simulation champions to model simulation best practices. • There might be a challenge in ensuring the sustainability of SBE due to limited funding committed to faculty education and supporting this teaching strategy.
	Component C: Student/learner elements		
Student preparation needs | Roles.	• Students must engage in preparatory activities that include acquiring the theoretical knowledge/content relevant to the intended nursing skill(s) before exposure to a simulation learning experience. • Students have roles and responsibilities during simulation learning; they include: — completing preparatory activities or content, — taking charge of their learning, — respecting the simulation learning environment, — maintaining the contractual agreement of confidentiality about the content of the simulation experience, — conducting a peer evaluation assessment.	• Students must be pre-briefed to prepare them for the simulation experience. • Students must be debriefed after the simulation experience to ensure the acquisition of the intended clinical learning outcomes. • Simulation-based education offers students quality clinical experiences to meet clinical practice requirements.	• Simulation-based education provides students with opportunities for experiential learning and quality experiences. • Simulation-based education must be integrated into the curriculum to fully offer the learning opportunities that lead to acquiring the programme outcomes.
Instruction Methods /practices	• Important instruction methods or practices that enable students to achieve their learning goals include: • Deliberate practice • Role-playing	• Students must be debriefed to achieve the intended clinical competencies. • Using standardised patients is integral to simulation learning as one tool for achieving student learning	

	• Standardises patients
	• Cueing
	• Debriefing: practices include
	  • learner-self assessment
	  • asking open-ended questions
	  • silence
	  • advocacy inquiry
	  • directive feedback
	  • guided team
	  • self-correction approach and
	  • circular questions
		outcomes, and there should be a designated room for preparing them.	

	Existing Challenges		
	N/A	• Nurse educators are not trained in using and preparing standardised patients. • There is a risk that students might not gain meaningful learning through simulation because none of the educators was trained in providing structured debriefing sessions. • There is a possibility that students are not debriefed after the simulation session in the absence of a debriefing room.	N/A
	Component D: Designing simulations		
	Designing simulation involves elements that ensure the simulation learning processes are achieved, including pre-briefing, scenario development, fidelity, debriefing and evaluation. • Pre-briefing: — It is the initial step in designing simulations. — It serves as a mechanism that facilitates students' success when engaged in a simulation experience. — It is the stage where the educators promote and ensure students' psychological safety.	• Briefing, debriefing, scenario, evaluation, and fidelity are crucial aspects of the simulation process inherent in simulation use.	Debriefing is an essential element of the simulation learning process, and there should be a designated room where the session should occur.

	— Pre-briefing involves two aspects: preparation and briefing. — Essential guidelines for the pre-briefing process include ensuring that: ○ it is conducted by an instructor knowledgeable about the simulation scenario and the pre-briefing processes, ○ student preparation activities are based on a needs assessment and align with the simulation objectives, ○ the planned preparatory activities/content should match the students' academic level, ○ students should undertake the preparatory lessons before engaging in the simulation learning experience. • Scenario development: The simulation scenario should be based on a real-life patient situation (backstory about a clinical condition and needs). — Simulation scenarios can be developed by a small multidisciplinary team, including course lecturers, research clinicians, simulation experts and other lecturers. — They are also available as software that can be purchased. — Properties of scenarios include clear student learning objectives, the patient situation, the type of mannequins, cues, standardised patients, student-assigned roles, time frames, and aspects that require problem-solving abilities. — A scenario should be scripted or presented in a template to maintain consistency. — Pilot the scenario before implementing it with the intended students. • Fidelity: — Simulation learning requires physical fidelity (environment and equipment) to mimic clinical setting reality.		

	— SBE requires three fidelity levels (low-medium-high) to ensure learners acquire competencies across the learning domain (cognitive, psychomotor and affective). — Using high-fidelity mannequins/ simulation equipment resources enables the replication of multiple patient conditions and enhances the acquisition of various competencies for undergraduate nursing students. — Evidence has shown that replacing traditional clinical hours entirely or partially across undergraduate nursing courses with high-fidelity is possible. — Medium fidelity is cost-effective and can produce comparable outcomes to high fidelity. — Mental health nurses benefit from using aspects of low-fidelity simulation, such as role-plays. — Low fidelity is associated with developing gross psychomotor and assessment skills effectively. — The lack of high-fidelity equipment and resources should not limit the integration of simulation-based education into a nursing programme in any setting. • Debriefing: — Students must be debriefed because that is where learning takes place in SBE. — Debriefing sessions must be conducted in every simulation experience, regardless of the delivery platform (physical/virtual). — A trained or experienced debriefer must conduct all debriefing sessions using standardised tools or frameworks. — There are two forms of debriefing: facilitator-guided (by an instructor/lecturer) and learner-guided (by the student himself/herself). — Learner-guided are utilised in virtual simulation learning or with students enrolled in a distance learning programme. — The debriefer should be an individual who observed or participated in the simulation learning experience.		

	— Debriefing should be conducted immediately after/ post the simulation experience; however, it can be done during the scenario. — Important adjunct methods that enhance the debriefing process include co-debriefing, video-assisted debriefing, and debriefing scripts. • Simulation evaluation: — Through simulation, student performance can be examined across three types of assessments: o formative, o summative and o high stakes. — The facilitator's debriefing competence should be evaluated periodically to assess and improve their skills. — The quality of the simulation scenario/learning experience is evaluated to assess its effectiveness in achieving the learning outcomes. — Evaluations should be conducted by a trained instructor using validated and reliability-tested tools or instruments.		
	Component E: Infrastructure and Equipment (Simulation resources)		
IT devices and software	• Necessary simulation resources include: • Equipment for facilitating simulation learning, which, in turn, includes: — Audio-video system for use as adjuncts during debriefing and monitoring student performance	• Technical equipment such as video, audio, and recording and broadcasting systems are needed to facilitate simulation learning.	• Information technology, computers, and audio-visual systems are needed in the simulation learning environment. • Equipment should be available to ensure readiness for simulation use.
simulation equipment/tools	• Simulation equipment is necessary for creating the desired level of realism to promote optimal learning through SBE, including: — Computerised mannequins mimic physiological features such as breathing, lung sounds, chest movements, pupillary reflex, coughs, and vomiting and can interact with students (high-fidelity).	• Provision of simulation equipment such as obstetric mannequins, critical care mannequins, monitors and software for clinical scenarios. • Provision of clinical equipment such as hospital beds, monitoring equipment, obstetric equipment	

	— A computerised mannequin that can reproduce human physiological features except for specialised features such as pupillary reflexes and chest movement, and task trainers for practising catheter and intravenous insertion skills (medium fidelity). — Partial task trainers or torsos (low fidelity). — Standardised patients. — Role-playing.	(vacuum extractors), and consumables.	
Physical Infrastructure	None	• There should be at least an accommodative training room over thirty square metres, a control room, and a debriefing room separated by a big glass window. • Bathrooms/Changing rooms	There should be a physical structure designed for simulation learning.
	Component F: Simulation Outcomes		
cognitive | Psychomotor | Affective	• Students acquire a variety of outcomes and competencies through simulation-based learning, including: — Satisfaction — Self-efficacy — Self-confidence — Reflective thinking skills — critical thinking skills — clinical skills — assessment skills — communication skills — teamwork/collaboration skills — management and leadership skills — clinical judgement skills — ethical and professional practice attitudes • A simulation scenario should contain the actual needs of patients to ensure students develop skills applicable in clinical practice to promote patient safety.		

In conclusion, the lessons learned outlined are meta-inferences that combine the scoping review and the survey findings. The scoping review generated data on best practices in simulation-based education, which represent the ideal factors. At the same time, the survey studies (A and B) provided data that informs about the factors that would influence the integration of in Eswatini nursing education context. The tabulated lesson learned served as a data source for the experts when developing the framework. The next section presents the findings or conclusions that emerged from the experts' opinions.

6.4 DEVELOPING THE FRAMEWORK: FINDINGS FROM EXPERTS OPINIONS:

Three processes guided the development of the framework: lessons learned from the scoping review and the survey studies, the NLN Jeffries simulation theory and experts in simulation and nursing education. The scoping review findings provided the ideal situation regarding simulation practices, while the survey findings informed the experts about what could be ideal for the Eswatini context. The NLN Jeffries theory model guided the Experts on aspects to be considered when developing simulation, and the concepts served as the structure for the proposed framework. An iterative research methodology enabled the study participants to draw conclusions that answered the research objective.

The rationale for using the integrated meta-inferences (data-matrix tabulated in 6.1) was to develop a framework informed by evidence-based practices and context-specific evidence. The latter consideration ensured that this framework's recommended aspects are contextually relevant to this setting's unique needs. The development of a setting-specific simulation programme was emphasised by the WHO (2013), saying it should align with the fiscal resources of the context. Using the NLN Jeffries Simulation Theory concepts for this framework also served as a guidebook for essential considerations inherent in SBE, add to that, the framework is grounded on sound theoretical perspectives.

The NLN Jeffries Simulation Theory consists of five (5) major elements. They are the context, background, design, simulation experience and outcomes (Jeffries, Rodgers and Adamson, 2015; Jeffries, 2021). These concepts served as the structural components (themes) and guided the content to consider when developing the framework for

integrating simulation into the Bachelor of Nursing Science programme in Eswatini. Below is a brief description of the NLN Jeffries simulation theory concepts, highlighting each element's key considerations. Along with that briefing is the description of the Eswatini proposed framework constructs, highlighting background issues and evidence that informed the recommended aspects/guidelines.

6.4.1 Context

Simulation-based education exists within a particular context. The context influences every aspect, from setting up the simulation-based education programme to implementation and evaluation. This component delineates the simulation's setting and purpose, such as assessing competencies or as a clinical education instruction method (Jeffries, Rodgers and Adamson, 2015; Jeffries, 2021). The context of this simulation-based nursing education programme is within nursing education institutions in Eswatini.

6.4.1.1 The Eswatini Nursing Education Context

Phase two of this study showed gaps regarding the availability of human resources, equipment, physical infrastructure, and financial resources for supporting simulation-based education. Despite these challenges, the Eswatini nursing education context uses simulation as a teaching modality in the educational preparation of the Bachelor of Nursing Science students to ensure they gain experiential learning and quality clinical experiences. The Bachelor of Nursing Science programme comprises four major courses: general nursing, midwifery, community and mental health nursing. In some Faculties, it is housed within three departments: General Nursing Science, Midwifery, Community and Mental Health Nursing.

The inadequate state of human, physical and material resources could be attributed to the unavailability of financial resources. The study showed that “little” fiscal resources were available to support the advancement of simulation-based education, from securing one-time to recurrent resources. At the same time, the study findings showed that nurse educators regard simulation-based education as an essential pedagogy that must be urgently implemented. Therefore, the following takeaway messages were recommended by the experts (Annexures 24, sample of transcripts and 25 analysis product):

Takeaway messages:

- Due to the limited available human, financial and structural resources in the NEIs in Eswatini, the programme should be implemented in a phased manner.
- As the midwifery programme has better resources available, this should be the starting point for integrating simulation into the curriculum, followed by the General Nursing Programme.
- The general nursing programme should incorporate lessons learned from integrating simulation into the midwifery programme.
- The lessons learned from the survey study showed that the institutions are poorly resourced.

6.4.2 Background

The background discusses the structural measurements that are the cornerstone in designing and implementing a quality simulation programme. The structural measurements are (a) the goal(s) of the simulation programme, (b) students' expectations or benchmarks, (c) theoretical perspectives, (d) mapping of simulation within the curriculum and (e) resources (Jeffries et al., 2015; Jeffries, 2021).

The scoping review study indicated that simulation-based education aims to prepare students who are ready for professional practice (Bryant et al., 2020). Similarly, survey B showed that simulation-based education teaching modality is engraved into the mission and philosophy of the Eswatini nursing education institutions. The overarching goal is to ensure students develop clinical skills through experiential learning and access to quality experiences in readiness for patient care. Moreover, the scoping review informed that using experiential learning leads to achieving patient safety outcomes (Bryant et al., 2020). Simulation expectations were also realised through the scoping review findings. They include teaching the students to integrate theory into practice, develop critical thinking skills, develop technical and non-technical skills embraced by registered nurses in readiness for professional practice, and practice nursing skills in a safe learning environment without fear of harming patients.

The scoping review revealed that simulation is a structured teaching and learning strategy grounded on multiple theoretical perspectives. They include experiential learning theory, constructivism, competency-based education and adult learning theory (Alexander et al., 2015; Aebersold, 2018; Ludlow, 2021). Findings from the survey B study showed that the Eswatini nursing education institutions embrace some aspects of experiential learning theoretical perspectives.

Resources such as time and equipment are elements that impact the design of the simulation experience (Jeffries et al., 2015). The lessons learned from the scoping review underscore the need for protected time for educators to integrate simulation into the curriculum and the availability of policies, procedures, and guidelines for guiding the simulation process. Equipment resources include access to quality technologies (computers, video recording systems) and mannequins.

The Eswatini nursing education context is further characterised by limited equipment for supporting clinical learning. The concerns include the simulation equipment types (mannequins) and clinical and technical equipment resources. The institutions mostly have low-fidelity mannequins (static mannequins) and some with medium-fidelity mannequins (task-trainers that mimic heart sounds for midwives training); however, none had high-fidelity mannequins and software for clinical scenario simulation. The simulation centres had physical resources such as hospital beds, trolleys, and cabinets but lacked patient monitors, including defibrillators, electrocardiogram (ECG) machines, critical care monitors and other consumables. In addition, the simulation centres were not equipped with technical equipment such as video, audio, and recording and broadcasting systems.

All the institutions had designated simulation learning environments (physical spaces). However, the infrastructure needs modification to accommodate some of the ‘latest’ architectural design features essential to supporting simulation learning. The missing structures include rooms designated for debriefing, preparing standardised patients, observation or a control room and a meeting room separate from the simulation room with a glass window.

Takeaway messages:

Due to the described background of the Eswatini nursing education context, it is recommended to:

- Conduct a needs assessment to identify the goal that the Midwifery programme wants to achieve with simulation-based education that will help motivate the procurement of resources that meet the programme goals and outcomes.

- Allocate protected time to faculty engaged in integrating simulation-based education into the Midwifery programme so that the educational strategy does not exist as an add-on strategy.
- Use available funds and maybe apply for grants to redevelop the simulation learning infrastructure to incorporate design features such as a debriefing room.
- Based on available resources, simulation expectations should be planned, and student learning should be scaffolded accordingly.
- Ensure the use of the International Nursing Association for Clinical Simulation and Learning (INACSL) best practice standards and the NLN/Jeffries Simulation Theory as benchmarks for developing, designing, implementing and evaluating a simulation-based education programme.

6.4.3 Design

The design encompasses elements needed to implement a successful simulation experience, including the simulation objectives, scenario, fidelity, prebriefing, and debriefing (Jeffries, Rodgers and Adamson, 2015; Jeffries, 2021). Findings from the scoping review informed that objectives should be set clearly to ensure the students achieve the programme outcomes within prelicensure education, midwifery, general nursing, community and mental health nursing (Hayden et al., 2014; Aebersold, 2018). Components of the midwifery programme practical skills range from simple/basic normal midwifery technical skills to obstetric emergencies and neonatal care and resuscitation.

The objectives inform the simulation scenario's content and the fidelity selection. Educators can use prewritten scenarios and modify them according to the student-level outcomes or establish a multidisciplinary team to develop simulation scenarios for the programme. Currently, the Eswatini nursing education institutions lack simulation

scenario software. On the other hand, simulation learning requires the availability of physical (environment and equipment) reality to mimic clinical settings. The widely used high-fidelity simulation is associated with acquiring high-order clinical skills and reproducing multiple patient situations, leading to students developing comparable clinical competencies. Moreover, not all authentic simulation clinical experiences require high-fidelity mannequins/equipment to meet programme outcomes (Arthur, Levett-Jones and Kable, 2013; Massoth et al., 2019).

The design element also encompasses prebriefing and debriefing. Findings from the scoping review informed that prebriefing is the initial step in designing simulations and involves student preparation and briefing. Debriefing is considered the most crucial part of simulation learning. It takes place in a designated room and requires a trained facilitator to ensure the students take into practice the appropriate clinical competencies.

Takeaway messages:

The elements to recommend for designing a simulation learning experience that meets the economic status of Eswatini nursing education institutions include:

- Simulation learning is scenario-driven. Form a small multidisciplinary team to develop a simulation scenarios template to standardise the development of scenarios for the midwifery programme. The same template can guide the formulation of simulation scenarios for the general nursing programme.
- Consider purchasing pre-written simulation scenarios if funds are available.
- Use a low-fidelity mannequin: example include Mama Natalia to simulate multiple obstetric skills, including normal delivery, post-partum haemorrhage, assessment and communication skills. NeoNatalia mannequin is another low-tech fidelity equipment. Both mannequins are useful in simulating neonatal resuscitation skills, shoulder dystocia and newborn care.
- High-fidelity mannequins can be purchased when funds are available for operation and maintenance.
- Initiate using standardised patients (SPs) instead of computerised/programmed patients to ensure the students develop cognitive (history taking and analysis of

findings), psychomotor (assessments/examinations) and affective (communication and professional attitude) skills.

- Ensure that students are are prebriefed and debriefed in all planned simulation learning experiences.
- Use a debriefing framework or templates when facilitating debriefing to standardise learning across the programme.
- Prepare a budget plan informed by a needs assessment.

6.4.4 Simulation Experience

The simulation experience refers to the simulation learning environment characterised by elements that support meaningful learning: experiential, interactive, collaboration between the educator/instructor and the students, student centredness and trust (Jeffries et al., 2015; Jeffries, 2021).

Takeaway messages:

- Establish a contractual agreement of confidentiality to maintain psychological safety during the simulation experience.
- Prepare students for role-playing to ensure their involvement in their learning.
- Scaffold the simulation learning experience in line with the student level and expected outcomes.

6.4.4.1 Facilitator and Educational Strategies

Simulation learning occurs as a result of dynamic interactions between the facilitator and the student, and each brings a set of attributes that influence teaching and learning, respectively (Jeffries et al., 2015; Jeffries, 2021). Core facilitator attributes highlighted and similar to those identified in the scoping review include possessing knowledge, skills, and attitudes to plan, design, implement and evaluate simulation experiences and competent in using educational techniques (Jeffries et al., 2015; Jeffries, 2021)

Findings from the scoping review study indicated that faculty training in simulation pedagogies is vital to delivering quality simulation experiences regardless of the field of speciality, e.g. Midwifery lecturers.

The survey studies in phase two revealed that the Eswatini nurse educators articulated the need for integrating simulation-based education into the Bachelor of Nursing Science programme curriculum. Although a clearly defined need exists for integrating simulation-based education into the curriculum, no educators have been formally trained in using simulation pedagogy. Most are informally trained (self-trained) through reading literature, peer-to-peer and during nursing education training. The absence of credentialled or trained personnel in simulation pedagogy is apparent as the institutions lack simulation champions or a designated faculty member to coordinate simulation-based education activities and model best practices. The lessons learned from the scoping review study indicated that simulation-based education is a pedagogy that requires trained educators/facilitators/instructors to achieve the goal of quality clinical simulation learning experiences, given that they influence the learners' educational experience.

Takeaway messages:

Given the identified faculty needs, the following points are recommended before rolling out a simulation programme:

- Establish pre-knowledge of the educators regarding simulation-based education to identify their strengths, ensure appropriate motivation, and identify simulation champions.
- Develop a training programme to upskill the educators/lecturers about simulation pedagogies. The training programme will further be used to orient new staff members about the principles of the simulation process as well as ongoing faculty development and support.
- At least two faculty members should be formally trained to drive the programme and share knowledge with other staff members.

6.4.4.2 Participants

The students are the simulation participants. They come into simulation learning with various attributes that impact their learning experiences, including non-modifiable factors such as age and gender and modifiable ones, such as level of anxiety, self-confidence, preparedness for learning and willingness to learn (Jeffries et al., 2015; Jeffries, 2021).

Additionally, the students' simulation learning experiences are impacted by role assignments (Jeffries et al., 2015; Jeffries, 2021). Elements that impact student learning and should be considered when planning simulation learning experiences to enhance interactive learning have been identified through the scoping review research and the information presented in Table 6.1. Further, the scoping review findings supported using prebriefing before engaging students in simulation learning, which entails preparing students for simulation learning and transfer of appropriate knowledge, judgements and skills to clinical practice through debriefing. However, Survey B revealed that none of the Eswatini educators were trained in this principle of student preparation.

Takeaway messages:

- Educators should be trained in planning prebriefing sessions for their students before enrolling them into a simulation scenario, including ensuring access to simulation preparatory activities.
- Establishing students' simulation learning experiences, roles and responsibilities during prebriefing, scenario and debriefing.
- Engage students in debriefing with every simulation scenario to guide student learning.

6.4.5 Outcomes

The NLN Jeffries simulation theory outlines three categories of outcomes realised through the effectiveness of simulation use: participants (students) outcomes, patient outcomes and systems outcomes (Adamson, 2015; Jeffries, Rodgers and Adamson, 2015; Jeffries, 2021). The findings from the scoping review informed about various outcomes of simulation learning to students/participants; they include critical thinking skills, clinical skills, assessment skills, communication skills, reflective thinking skills, professionalism and ethical practice, self-efficacy, confidence, management and leadership skills. Patient outcomes included patient safety, while systems outcomes identified covered the cost-utility of using simulation.

Takeaway messages:

- The educators must be trained to ensure the students achieve the simulation outcomes.
- The faculty should use standardised tools for debriefing and evaluation of students learning.
- Evaluate student performance to ascertain behaviour change and development of clinical judgement desired for clinical practice.
- Evaluate the simulation programme to establish its effect on student learning.
- Evaluate the SBE with another comparable approach to inform practice and the educational system.

6.5 COMPONENTS OF THE FRAMEWORK FOR INTEGRATING SIMULATION IN THE BACHELOR OF NURSING SCIENCE PROGRAMME

The framework is set to close gaps that affect clinical education during the educational preparation of undergraduate nursing students. The simulation framework indicates needs that the nursing education institution should address to be able to integrate this innovative educational strategy fully. The framework includes educators' training as they are key players in the educational delivery of clinical education. Trained educators will ensure an increase in providing interactive learning, create standardised learning opportunities, and be able to support, guide and evaluate student learning as they progress towards meeting all the desired nursing competencies. The framework also guides nursing education institutions on the required human resources, simulation equipment and infrastructure that would facilitate the process of integrating simulation to ensure access to a quality clinical learning environment. Students are recipients of clinical education, and this framework highlights their roles and responsibilities that will enable them to develop clinical competencies before they are placed to care for patients.

The Eswatini Nursing Council (ENC) are responsible for regulating the clinical practice and education to protect the public from unsafe practices. This framework provides ENC with an opportunity to mandate the integration of simulation into nursing programmes, as students will be able to hone their clinical skills before they are placed to care for patients, thus ensuring patient safety. The EN has the opportunity to assess student clinical

competencies before licensure to complement current entry-to-practice examination processes.

The framework consists of five domains that emerged from the inputs of the experts: (a) training or preparation of educators, (b) Setting it up for the programme, (c) Simulation equipment, (d) Simulation infrastructure and (e) Student/simulation participant. The framework provides elements to consider when planning to integrate simulation in order to ensure that the process is organised and systematic, thus preventing delays and pitfalls. The framework also shows relationships between the concepts and direction of undertaking the integration process. Figure 6.1 displays the components of the model.

6.5.1 Training or preparation of educators

Training educators for simulation-based education is essential as it ensures that they have a clear understanding of their roles and responsibilities and are upskilled with simulation principles to facilitate the integration process and also to maintain and evaluate the quality of the simulation programme. Additionally, educators should be capacitated to prepare students for simulation, support, provide feedback using a standard debriefing framework and evaluate their performance before being placed to care for patients. Such skilled individuals are needed to take up the role of simulation leaders/simulation champions to coordinate activities that relate to simulation-based education. The activities of the simulation champion include working with the institution management to support the initiative of integrating simulation and serving as mentors and role modellers. The trained simulation educators are also required to guide the budget for simulation and the development of an orientation programme for new faculty members to maximise the use of simulation equipment for the benefit of students. Training ranges from formal education leading to certification, conferences, workshops and an orientation programme.

6.5.2 Situating simulation in the programme

Simulation should not be an add-on educational strategy but should exist within the programme. However, integrating simulation into a nursing programme is not a one-time event (Foisy-Doll and Leighton, 2017). Therefore, a need assessment should inform the decision to get started with the process of integrating simulation, given that its success is

dependent on multiple factors: an organisational culture that supports change, institutional, faculty and programme philosophies, which clearly communicate the need for simulation-based education, funding and time allocation. Similarly to Foisy-Doll and Leighton (2017), the experts in this study emphasised that integrating simulation should be phase-based; it should start small— by choosing one programme (midwifery or general nursing) based on available resources. Then, gradually integrate it across the undergraduate nursing programme as knowledge expands and resources become available.

6.5.3 Simulation infrastructure

The element of simulation infrastructure describes the standard physical building, which is the setting where clinical education in simulation takes place before students are placed to care for real-life patients. The physical learning environment in simulation-based education should be designed or redesigned to accommodate both the students and the simulation equipment. Apart from the general infrastructure that mimics the hospital setting, essential rooms that should be part of the simulation infrastructure are (a) a debriefing room to guide students' learning, (b) a training room, (c) an observation or control room, (d) storage room.

6.5.4 Simulation equipment

Educators need equipment to facilitate student learning through simulation. The experts recommended that the integration of simulation should be initiated using available low-fidelity resources, and be combined with moulage, role-plays and standardised patients. Simulation educational strategy uses a wide range of modalities: low-fidelity, medium-fidelity and high-fidelity mannequins and clinical equipment to meet students' outcomes. However, the literature has shown that integrating simulation is challenging due to the hefty expenses of equipment, among other factors (Hosny et al., 2017; Swart, Duys and Hauser, 2019). The World Health Organisation has recommended that the integration of simulation in nursing and midwifery education be done using available resources (WHO, 2013). Among the three levels of fidelity, low fidelity is cost-effective and capable of ensuring patient safety (House et al., 2016). Massoth et al. (2019) reported that low-

fidelity modalities are comparable to high-fidelity levels in providing high-quality simulation experiences that cut across the domain of learning. However, it was found lacking in promoting confidence. Hence, a need for combining static simulators with moulages, such as Mama Natali, to stage postpartum haemorrhage in obstetric emergencies to close the gap while making plans that lead to securing medium and high-fidelity equipment if it aligns with the student programme outcomes.

6.5.5 Students/ Simulation Participant

The element of students describes their roles and responsibilities as active participants in their learning that leads to the development of clinical competencies. However, the simulation learning process is facilitated by a trained educator. Students are pre-briefed to participate in the simulation. During the pre-briefing stage, they are expected to actively participate in their learning by undertaking preparatory activities (assignments, lectures, demonstrations, reviewing and discussion of case studies, watch videos) that relate to the planned clinical simulation experience. Students are also responsible for participating in the simulation scenarios to learn and practice clinical skills under the guidance of the facilitator, reflect on the learning experience, engage in debriefing to learn and improve their performance, take up assigned roles and evaluate the quality of the simulation.

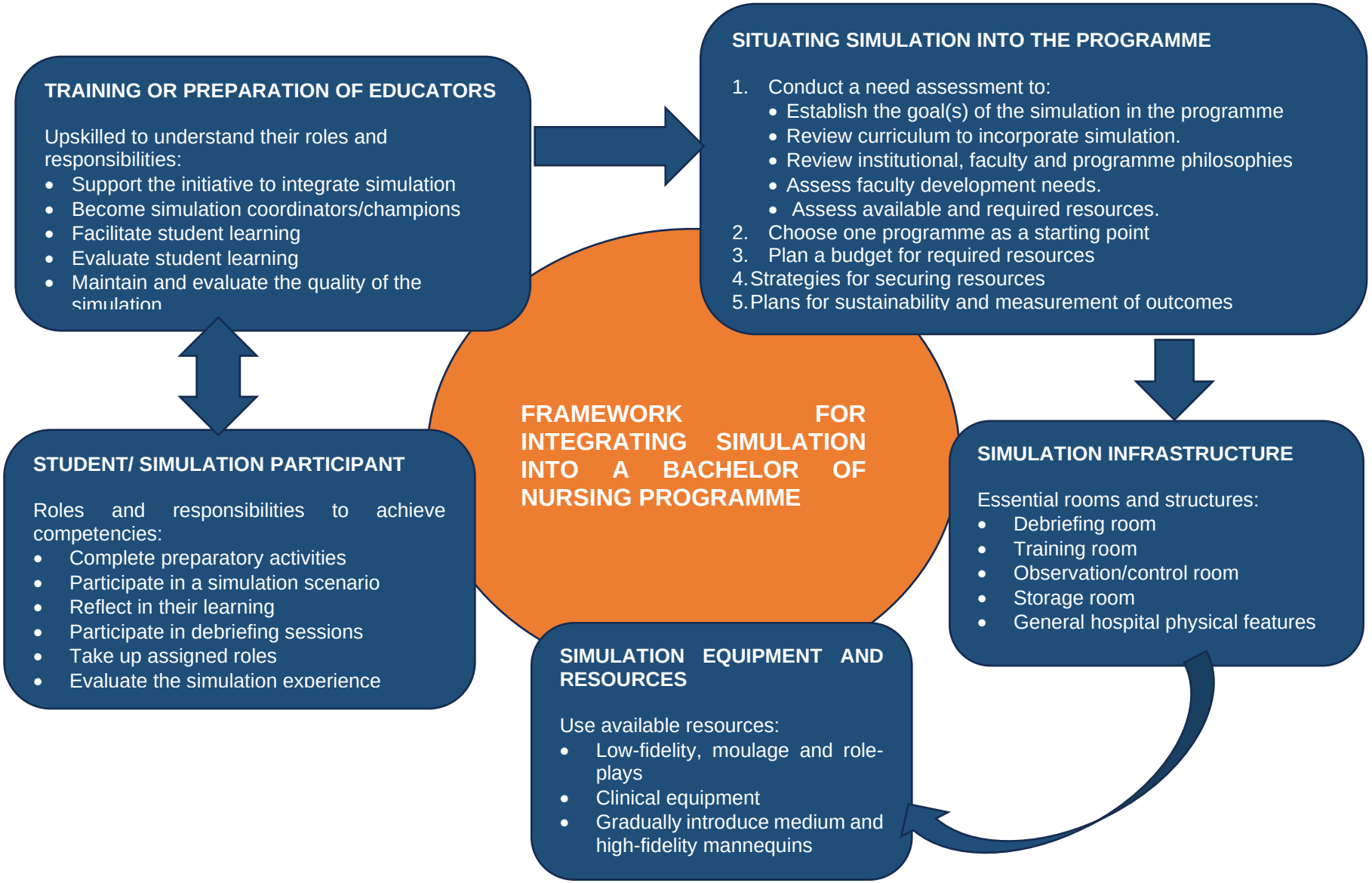


Figure 6.1: Framework for Integrating Simulation into a Bachelor of Nursing Science Programme

6.6 IMPLEMENTATION PLAN OF THE FRAMEWORK

The previous section describes the framework's content generated through the experts' opinions using the NLN Jeffries Simulation Theory as a guiding framework. The data was framed into statements to outline what should be done to integrate simulation into the Eswatini nursing education programme. The statements or activities are listed under the previously determined themes of the lessons learned, now marked as the framework domains. Domain A: Training or preparation of educators; Domain B: Selecting a course; Domain C: Simulation equipment; Domain D: Simulation infrastructure; and Domain E: Student/simulation participants. Below is the framework's implementation plan for integrating simulation into the Eswatini nursing education context in a phase-based manner.

Table 6.2: Implementation Plan of the Simulation Framework

Phase I **(First 6 months)**	**Phase II** **(7 months to 2 years)**	**Phase III** **(3 to 5 years)**
Domain A: Training or preparation of educators: to ensure that they are aware of the concept of simulation knowledge, implementation processes and principles		
• Identify simulation champions and train them first via an online course. • Identify the strengths of existing educators and train them according to their needs. • Develop a training programme that would be accessible to all staff: — Learn how to develop students' objectives. — How to use simulation equipment and audio-visual devices. — Learn about simulation fidelity. — Learn about prebriefing students. — Learn about formulating, implementing and facilitating a simulation scenario. — How to facilitate a debriefing session, provide student feedback, and evaluate student performance.	• Trained staff members must be supported to implement possible simulation experiences using available resources. • Develop a simulation scenario template. • Identify and contextualise debriefing tools. • Develop evaluation instruments. • Recruit and train standardised patients (SPs). • The institution should consider membership of a recognised simulation organisation, such as the Society for Simulation in Healthcare, for support and resource access. • Develop a simulation community to share practices.	• Ensure ongoing faculty development and support of staff engaged in simulation. • Orient and train new staff members. • Faculty members should obtain formal training in simulation that leads to certification (certificate, diploma/degree).
Domain B: Situating simulation into the programme: Integration of simulation into the Midwifery Programme: align programme outcomes		
• The Midwifery department should collaborate with	• The Midwifery Department should appoint a subcommittee	• Review the Midwifery simulation programme.

management and relevant stakeholders to incorporate SBE into the institution's strategic plan. • The Department of Midwifery must liaise with the institution's management and ensure a written commitment to SBE. • Develop a business plan for the simulation programme to attract grants/funding.	to revise the existing curriculum to integrate simulation. • The Midwifery Department should identify the programme goals for simulation learning. • The subcommittee should develop guidelines, protocols, policies and procedures for guiding simulation learning. • The subcommittee should lead the development of simulation scenarios for teaching midwifery skills. To develop the midwifery simulation scenario, members should include the course lecturer, one or two other lecturers, a clinical instructor, a clinician, simulation experts/champions, and researchers.	• Expand the goal of simulation learning into other programmes, such as general nursing. • Revise the General Nursing curriculum and incorporate simulation-based education programme outcomes.
Domain C: Simulation equipment: educational resources that would be used to develop the student competencies in readiness for clinical practice		
• The Midwifery Department subcommittee should conduct a needs assessment to identify the necessary equipment resources for the Midwifery programme. • Prepare a budget plan for procuring equipment: — Simulation equipment — Clinical equipment — Technological devices.	• Suggested simulation equipment at this phase includes low-cost mannequins such as Mama Natalia and NeoNatalia.	• Consider procuring additional mannequins, considering the number of students and programme/training needs. • High-fidelity mannequins can be procured based on assessed need.
Domain D: Infrastructure: a physical place for simulation learning for the Midwifery programme		
• The department should benchmark for a simulation laboratory/centre infrastructure plan or buy an existing simulation centre plan to build the simulation learning environment. • The layout of the simulation/basic features includes: — Observation room — Debriefing room — Standardised patient room — Storeroom. — Computer room.	• Identify the location of the building premises of the simulation centre. • Apply for funding for building the simulation centre/laboratory	• Build the simulation learning space for the programme.
Domain E: Student/Simulation Participants: students are key stakeholders; they should be clear about their roles in simulation learning.		
• Conduct needs assessment to establish students' attributes and simulation expectations.	• Introduce students to formal simulation-based learning (pre-	• Conduct pre and post-tests to evaluate the simulation programme.

	briefing and debriefing processes). • Pilot test simulation scenarios before engaging students in the learning process. • Student to sign contractual confidentiality document.	

6.7 Conclusion

This chapter developed a framework for assisting Eswatini nurse educators in integrating simulation into the Bachelor of Nursing Science programme, guided by simulation and nursing education experts. In the next chapter, the outcomes of the framework test for clinical utility by Eswatini nurse educators are discussed.

CHAPTER 7: THE DELPHI SURVEY

7.1 INTRODUCTION

A modified Delphi method was used to evaluate the clinical utility of the framework for integrating simulation into the Bachelor of Nursing Science Programme in Eswatini. Experts involved in the educational preparation of the Bachelor of Nursing students in Eswatini were invited to participate in the Delphi survey to establish their opinions regarding the relevance and feasibility of the identified activities of implementing the framework. The Delphi survey was completed in two rounds.

7.2 AIM

The study aimed to evaluate the framework for clinical utility in preparing Bachelor of Nursing Science students in Eswatini.

7.3 SAMPLING OF THE EXPERTS (STUDY PARTICIPANTS)

A purposive sampling technique was used to select the study participants. Potential participants included only those currently teaching clinical skills using a simulation-based education modality within nursing and midwifery education. A total of 18 nurse educators were eligible candidates for this study, and all were invited. However, only 16 responded within the adjusted timeframe.

7.4 DATA COLLECTION

The data collection tool was developed using the framework's content proposed by the simulation experts in phase three. A self-questionnaire with a three-point Likert scale and response options, agree, partially agree and disagree, was administered to evaluate the framework's utility.

7.4.1 Description of the Questionnaire

The questionnaire has 65 activities itemised within the five domains of the framework. The framework's activities were spread across three phases, indicating a specified timeline for the activity to be accomplished. Phase 1 activities are timed between 1 and 6 months; phase

2 activities are planned between 7 months and 2 years; then phase 3 activities should be undertaken in 3 to 5 years. In Domain A: Training or preparation of educators had 19 itemised activities; Domain Situating simulation into the programme (midwifery programme) had 18 activities; Domain C: Simulation equipment had 11 activities; Domain D: Simulation infrastructure had 10 activities and Domain E: Student/simulation participants had 7 itemised activities to evaluate. This questionnaire is presented in Annexure 19.

The data collection tool was pretested to establish face and content validity among three experts before being used for the main study. The questionnaires were hand-delivered or emailed, depending on the participant's preference.

In round 1 of the data collection process, participants evaluated the framework's utility using a structured self-administered questionnaire with a space for comments. The participants were asked to comment if they partially agreed or disagreed that the activity was relevant and/or feasible.

In round 2, all the experts who participated in round one were invited. The findings of the first round were reported to the participants. The questionnaire for the second round only consisted of the activities from which consensus had not been reached.

7.5 DATA ANALYSIS

Round one data was analysed using the Statistical Package for Social Science (SPSS, 20.0 version) software. The benchmark consensus percentage score was eighty percent and above (≥80%). Frequencies and percentages were produced, informing which items had or had not reached the consensus level. Textual data generated from participant comments were analysed using Hsieh and Shannon's (2005) qualitative content analysis approach. Findings were used to modify the framework.

7.6 ROUND ONE DELPHI STUDY: RESULTS

The data set included information about the participants' sociodemographic characteristics and the main findings. The description of the findings is presented below:

7.6.1 Sociodemographic Characteristics of the Study Participants

A total of 16 experts (midwifery and general nursing) educators from the three (3) nursing education institutions (NEIs) involved in the preparation of the Bachelor of Nursing Science students participated in the Delphi study. The largest number, n=7, were from NEI-A, n=4 were from NEI-B, and n=5 were from NEI-C. The study participants included a head of department, senior lecturers and lecturers with experience ranging from 1 year to 41 years. The participants were specialists in midwifery science (n=4), advanced midwifery (n=3), advanced midwifery and neonatal science (n=2), nursing education (n=2) and advanced medical-surgical nursing (n=5). The study participants' characteristics are presented in Table 7.1 below:

Table 7.1: Sociodemographic Characteristics of Delphi Survey Experts (N=16)

Participant code name	Institution code name	Age	Duration of Service as Educators (yrs)	Highest qualification	Position	Speciality
NE1	NEI-C	37	6	Master's degree	Lecturer	Advanced Midwifery and Neonatal Science
NE2	NEC-B	37	1	Master's degree	Lecturer	Nursing Education, Community, Management and Midwifery
NE3	NEI-A	39	5	Master's degree	Lecturer	Midwifery
NE4	NEI-B	61	21	Master's degree	Senior Lecturer	Master of Midwifery Practice
NE5	NEI-B	37	5	Master's degree	Head of Department (HOD)	Midwifery, Nursing Education, Management and Community Health Nursing
NE6	NEI-A	44	15	Doctorate	Senior Lecturer	Advanced Medical-surgical Nursing, Human Physiology, Public Health
NE7	NEI-C	42	8	Master's degree	Lecturer	Midwifery
NE8	NEI-A	37	2	Master's degree	Senior lecturer	Advanced Midwifery and Neonatal Nursing Science
NE9	NEI-A	63	41	Doctorate	Senior lecturer	Advanced Midwifery & Nursing Education
NE10	NEI-B	57	8	Master's degree	Lecturer	Midwifery

NE11	NEI-C	41	2	Master's degree	Lecturer	Advanced Medical-Surgical Nursing
Participant code name	**Institution code name**	**Age**	**Duration of Service as Educators (yrs)**	**Highest qualification**	**Position**	**Speciality**
NE12	NEI-C	42	2	Master's degree	Lecturer	Advanced medical-surgical nursing (Nephrology Nursing)
NE13	NEI-A	35	7	Master's degree	Lecturer	Advanced medical-surgical nursing (Critical Care Nursing Science)
NE14	NEI-C	51	11	Bachelor's degree	Lecturer	Advanced Midwifery
NE15	NEI-A	45	12	Doctorate	Lecturer	Nursing Education
NE16	NEI-A	46	13	Doctorate	Lecturer	Midwifery

7.6.2 Participants' responses regarding the utility of the framework

The benchmark score for establishing whether a consensus was reached on each activity was 80%. Sixty-five (65) itemised activities were evaluated to determine the relevance and feasibility of the framework's content in integrating simulation into the Bachelor of Nursing Science programme for Eswatini nursing education institutions. In this study, context relevance refers to the degree to which the aspect is connected or useful to integrating simulation-based education into a programme. In comparison, feasibility refers to the practicality of the aspect to ensure the successful implementation of simulation-based education within the programme. Table 7.2 presents the findings; activities that did not reach a consensus are highlighted in grey.

Table 7.2: Experts' responses on the relevance and feasibility of the framework

DOMAIN A—TRAINING OR PREPARATION OF EDUCATORS: to ensure that they are aware of the concept of simulation knowledge, implementation processes and principles.							
PHASE I: 1 — 6 MONTHS							
		Relevance:			**Feasibility:**		
No	**Activity**	**Agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
		Percentage (%)			**Percentage (%)**		
1.	Identify simulation champions and train them first on the principles and implementation of simulation-based education within an existing programme.	93.8	6.3	0	81.3	12.5	6.3
2.	Identify the strengths of existing educators and train them according to their needs.	100	0	0	81.3	12.5	6.3
Develop a training programme that would be accessible to all staff:							
3.	To learn how to develop students' objectives.	93.8	6.3	0	93.8	6.3	0
4.	How to use simulation equipment and audiovisual devices.	100	0	0	75	25	0
5.	Learn about simulation fidelity.	93.8	6.3	0	87.5	12.5	0
6.	Learn about prebriefing students.	87.5	12.5	0	87.5	12.5	0
7.	Learn about formulating, implementing and facilitating a simulation.	100	0	0	93.8	6.3	0
8.	Developing clinical simulation scenarios.	100	0	0	93.8	6.3	0
9.	How to facilitate a debriefing session, provide feedback to students and evaluate student performance	100	0	0			
PHASE II: 7 MONTHS — 2 YEARS							
		Relevance:			**Feasibility:**		
	Activity	**Agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
		Percentage (%)			**Percentage (%)**		

10.	Develop a simulation scenario template.	100	0	0	100	0	0

11.	Identify and contextualise debriefing tools.	100	0	0	93.8	6.3	0
12.	Develop evaluation instruments.	100	0	0	100	0	0
13.	Support trained staff to implement simulation experiences using available resources.	100	0	0	87.5	12.5	0
14.	Recruit and train standardised patients (SPs)	100	0	0	68.8	31.3	0
15.	Institution to consider membership to a recognised simulation organisation, e.g., Society for Simulation in Healthcare, for support and educational resources.	87.5	12.5	0	81.3	18.8	0
16.	Develop a simulation community to share best practices.	93.8	6.3	0	87.5	12.5	0
PHASE III: 3 — 5 YEARS							
		Relevance:			**Feasibility:**		
	Activity	**Agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
		Percentage (%)			**Percentage (%)**		
17.	Ensure ongoing faculty development and support of staff engaged in simulation.	100	0	0	93.8	6.3	0
18.	Orient and train new staff members.	100	0	0	100	0	0
19.	Faculty members should obtain formal training in simulation that leads to certification (certificate, diploma/degree).	87.5	12.5	0	56.3	31.3	12.5
DOMAIN B: SITUATING SIMULATION INTO THE PROGRAMME (INTEGRATION OF SIMULATION INTO THE MIDWIFERY PROGRAMME): Integrating simulation-based education into the programme indicates institutional readiness for culture change and ensures sustainability.							
PHASE I: 1— 6 MONTHS							
		Relevance:			**Feasibility:**		
	Activity	**Agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
		Percentage (%)			**Percentage (%)**		

20.	The Midwifery Department should engage/collaborate with institutional management and relevant stakeholders regarding integrating simulation into the programme to ensure the sustainability of simulation-based education and support for change).	100	0	0	100	0	0
21.	Develop a mission and vision statement for simulation-based education integration that aligns with the parent institution.	93.8	6.3	0	93.8	6.3	0
22.	Develop a strategic plan for simulation-based education that aligns with the programme's goals and institutional vision.	93.8	6.3	0	93.8	6.3	0
23.	Establish a written commitment from management to support simulation-based education.	100	0	0	93.8	6.3	0
24.	Establish institutional management plans to provide funding to support the commitment to simulation-based education.	100	0	0	81.3	18.8	0
25	Develop a business plan for the simulation programme to attract grants/funding.	100	0	0	87.5	12.5	0
PHASE II: 7 MONTHS — 2 YEARS							
		Relevance:			**Feasibility:**		
	Activity	**Agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
		Percentage (%)			**Percentage (%)**		
26.	Select a subcommittee responsible for integrating simulation into the midwifery programme.	100	0	0	93.8	6.3	0
27.	Review the existing curriculum to identify where simulation would enhance midwifery education.	100	0	0	93.8	0	6.3
28.	Develop an integration plan and timelines.	93.8	6.3	0	87.5	6.3	6.3
29.	Identify the goals of simulation in midwifery education.	100	0	0	93.8	0	6.3
30.	Identify the midwives' competencies to be achieved through simulation-based education (e.g., normal birth practices, neonatal resuscitation, obstetric haemorrhage, sepsis, communication skills, and clinical assessments).	100	0	0	93.8	0	6.3
31.	Develop guidelines, protocols, policies and procedures for guiding simulation learning.	93.8	6.3	0	100	0	0

32.	Select a small multidisciplinary team (course lecturer, one/two other lecturers, a clinical instructor, a clinician, simulation experts/champions, and researchers) to assist in developing clinical simulation scenarios for teaching midwifery skills.	93.8	6.3	0	93.8	6.3	0
33.	Develop the evaluation tools (standard checklist to assess student performance).	93.8	6.3	0	87.5	6.3	6.3
34.	Implement the simulation-based education programme.	93.8	6.3	0	93.8	6.3	0
PHASE III: 3 — 5 YEARS							
		Relevance:			**Feasibility:**		
	Activity	**Agree**	**Partially Agree**	**Disagree**	**Agree**	**Partially Agree**	**Disagree**
		Percentage (%)			**Percentage (%)**		
35.	Review and adjust integrating plans along with timelines.	100	0	0	93.8	0	6.3
36.	Review the midwifery simulation programme (evaluation of the programme's status in achieving the educational goals and uptake).	100	0	0	93.8	6.3	0
37.	Plans to integrate simulation into other departments or the entire Bachelor of Nursing curriculum should be initiated.	100	0	0	83.3	18.8	0
DOMAIN C — SIMULATION EQUIPMENT: educational resources that would be used to develop the student competencies in readiness for clinical practice.							
PHASE I: 1 — 6 MONTHS							
		Relevance:			**Feasibility:**		
	Activity	**Agree**	**Partially Agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
		Percentage (%)			**Percentage (%)**		
38.	Conduct a needs assessment to identify available simulation equipment: type, quality, quantity, and functional status.	100	0	0	100	0	0
39.	List the equipment required to meet the programme goals to avoid buying unnecessary equipment.	100	0	0	100	0	0

40.	Benchmark with other regional institutions on the type of equipment that can assist in achieving the programme goals (level of skills and intended competencies).	100	0	0	100	0	0
Prepare a budget plan for procuring equipment needed to create a realistic clinical simulation learning environment (short and long-term equipment purchasing plans) for the following:							
41	Mannequins: prioritise buying low-cost mannequins; Mama Natalia and Neo Natalia at this phase if there are financial constraints.	93.8	6.3	0	75	25	0
42	Room furnishings (e.g., beds, carts, monitors, medical instruments)	100	0	0	75	18.8	6.3
43	Technological devices, audiovisual systems	100	0	0	75	18.8	6.3
PHASE II: 7 MONTHS — 2 YEARS							
		Relevance:			**Feasibility:**		
	Activity	**Agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
		Percentage (%)			**Percentage (%)**		
44	Implement the equipment purchase plan based on the curricular needs of the programme.	100	0	0	93.8	0	6.3
45	Orient staff on how to use the simulation equipment to ensure readiness to implement the simulation learning within the programme.	100	0	0	100	0	0
46	Ensure that funds are allocated for equipment maintenance, repairs, and depreciation.	100	0	0	87.5	6.3	6.3
PHASE III: 3 — 5 YEARS							
		Relevance:			**Feasibility:**		
	Activity	**agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
		Percentage (%)			**Percentage (%)**		
47	Consider purchasing additional simulation equipment in relation to the number of students in need of educational equipment and programme/training needs.	100	0	0	87.5	6.3	6.3
48	High-fidelity mannequins (full-scale body mannequins) can be procured at this phase, depending on the programme's learning goals.	100	0	0	87.5	6.3	6.3

DOMAIN D: INFRASTRUCTURE: simulation-based education occurs within a physical building, the learning environment/space.							
PHASE I: 1 — 6 MONTHS							
		Relevance:			**Feasibility:**		
	Activity	**Agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
		Percentage (%)			**Percentage (%)**		
49	Assess the existing simulation laboratory physical infrastructure to identify what is available and missing.	93.8	6.3	0	93.8	0	6.3
50	The department should benchmark for a simulation laboratory/centre infrastructure plans/designs to build the learning environment or buy an existing simulation centre	100	0	0	87.5	12.5	0
51	The department should allocate the premises for building the simulation laboratory or renovating/redesigning an existing structure.	100	0	0	68.8	31.3	0
The department should have a physical building with the following structures/rooms:							
52	Observation room	100	0	0	56.3	43.8	0
53	Debriefing room	100	0	0	50.0	50.0	0
54	Storage room	100	0	0	56.3	43.8	0
55	Technical room	93.8	6.3	0	43.8	65.3	0
PHASE II: 7 MONTHS — 2 YEARS							
		Relevance:			**Feasibility:**		
	Activity	**Agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
		Percentage (%)			**Percentage (%)**		
56	Apply for funding/grants for building the simulation laboratory.	100	0	0	100	0	0
57	Effect plans for redesigning the existing simulation laboratory infrastructure.	100	0	0	87.5	6.3	6.3
PHASE III: 3 — 5 YEARS							

		Relevance:			Feasibility:		
	Activity	**Agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
		Percentage (%)			**Percentage (%)**		
58	Build the simulation learning space for the programme.	93.8	6.3	0	62.5	31.3	6.3
DOMAIN E: STUDENT/SIMULATION PARTICIPANTS: students are key stakeholders; they should be clear about their roles in simulation learning.							
PHASE I: 1— 6 MONTHS							
		Relevance:			**Feasibility:**		
	Activity	**agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
		Percentage (%)			**Percentage (%)**		
59	Conduct needs assessment to establish students' attributes and simulation expectations.	100	0	0	100	0	0
60	Develop contractual confidentiality documents to be signed by students before engaging in simulation learning.	100	0	0	100	0	0
PHASE II: 7 MONTHS — 2 YEARS							
		Relevance:			**Feasibility:**		
	Activity	**Agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
		Percentage (%)			**Percentage (%)**		
61	Introduce students to the formal simulation learning process (prebriefing and debriefing).	100	0	0	100	0	0
62	Pilot test simulation scenarios before engaging students in the learning process.	100	0	0	100	0	0
63	Conduct pre and post-tests to evaluate the simulation programme.	100	0	0	100	0	0
PHASE III: 3 — 5 YEARS							
		Relevance:			**Feasibility:**		

	Activity	Agree	Partially agree	Disagree	Agree	Partially agree	Disagree
		Percentage (%)			Percentage (%)		
64	Evaluate the simulation programme in relation to meeting students' needs.	93.8	6.3	0	93.8	6.3	0
65	Revise the programme based on established learners' needs and new innovative strategies in simulation learning.	100	0	0	100	0	0

7.6.2.1 Participant responses regarding the relevance of the activities

The experts found the activities relevant as they reached a consensus level of above 80% in the first round. Of the 65 activities, 46 statements reached a 100% consensus, followed by 16, which had a 93.8% agreement rate, and 3 items obtained 87.5%. Some activities did not obtain a 100% agreement, as some experts partially agreed that they were relevant; a comment about activity 5 said:

"*Simulation cannot be like real educational experience"* (NE3).

The participants were requested to comment if they partially agreed or disagreed concerning the activities' relevance and feasibility. However, more than 50% of participants who selected the partially agreed or disagreed option did not state why they chose the option. A sample of the experts' comments is attached in Annexure 26.

7.6.2.2 Participant responses regarding the feasibility of the activities

Consensus on feasibility was reached in activities itemised in Domain B: Integration Simulation and Domain E: Student/Simulation Participants. However, participants could not reach a consensus on ten (10) activities. The affected activities are found in three domains: Domain A: Training or preparation of educators (activities 4, 14 and 19); Domain C: Simulation equipment (activities 41, 42 and 43); and Domain D: Simulation infrastructure (activities 51, 52, 53 and 58), and are highlighted in grey in Table 7.2.

7.6.2.2.1 Domain A: Training or Preparation of Educators

Activity 4: This activity was on "how to use simulation equipment and audiovisual devices". This activity did not reach an acceptable level of consensus. However, the participants either agreed 75% (n=12) or partially agreed, 25% (n=4), that it was feasible to train educators on simulation equipment and audiovisual devices. The reason is attributed to the absence of the equipment and audiovisual devices. One participant stated that:

"How to use simulation equipment and devices might be challenged by a lack of applicable infrastructure and equipment." (NE8)

Similar sentiments were shared by participant NE15, listing additional challenges faced by the institutions:

"*Currently, our clinical lab lacks infrastructure, simulation gadgets/equipment, medical materials, and supplies. Additionally, there is no commitment from the management to improve the situation (at least in my NEI).* (NE15)

Researcher's lesson learned/decision: Educators must be trained on how to use the simulation equipment to avoid keeping them in boxes when made available because of a lack of knowledge and skills. The activity will remain as stated.

Activity 14: About 68.8% (n=11) agreed that it was feasible to recruit and train standardised patients (SPs), and 31.3% (n=5) partially agreed. Although the activity did not reach the acceptable consensus level, none of the experts disagreed that it could not be achieved, reflecting that it is possible and can be done with appropriate plans in place.

The participants who were uncertain about the feasibility of being trained to recruit and prepare standardised patients for use in simulation-based education were concerned about cultural views (acceptance of this practice in the context), availability of equipment and payment of the associated costs of using SPs.

NE10 felt beliefs and issues of equipment availability would hinder the training:

"It might be difficult to recruit SPs as they may decline due to moral beliefs; however, training is feasible if equipment is available." (NE10)

Participant 9 felt the use of SPs *"require[s] a lot of motivation and incentives".* (NE9)

Another who partially agreed on the feasibility of the activity was participant NE2; however, the participant suggested a cost-free solution or one with minimal costs:

"If the government cannot pay for those (SPs), maybe students can be asked to volunteer for non-invasive procedures, and manikins can also be used." (NE2)

Researcher's lesson learned/decision: Training on recruiting and using standardised patients seems to be a new modality in the study context. However, training educators on

utilising SPs would be beneficial given the concerns about the availability of simulation equipment resources. Therefore, the activity will be sustained.

Activity 19: Faculty members should obtain formal training in simulation that leads to certification (certificate, diploma/degree); only 56.3% (n=9) agreed that faculty should receive formal training in simulation use. On the contrary, 31.3% (n=5) partially agreed, and 12.5% (n=2) disagreed. The findings suggest that a minority deemed it unnecessary for educators to be formally prepared for using the simulation modality. However, some valued being trained but felt it was partially feasible because of the lack of financial support allocated for faculty development. One participant who seemed enthusiastic about being an accredited simulation facilitator said:

*"Those interested in certification training may not have funds or support, yet the training is very important." (*NE1)

Also interested was participant NE3, who stated the conditions that can motivate educators to enrol in a formal faculty development programme with possibilities to train the trainer with simulation use:

"Partially agreeing to faculty members obtaining formal training in simulation that leads to certification because it will sorely depend on their willingness and perceived need unless the training is provided within the University/Faculty." (NE3)

Others advocated for a non-certification and stated that:

"*Just a refresher course can assist."* (NE14)

*"A degree program might not be feasible since this is something new that is being introduced." (*NE10)

Researcher's lesson learned/decision: the training of educators for simulation use is mandatory. The simulation experts recommended in-service training per rising need (start small) with a free short course would be beneficial to educators to address cost or funding issues and to create awareness of what formal simulation-based education entails. Then,

formal training leading to certification will be considered once full simulation integration is initiated.

7.6.2.2.2 Domain C: Simulation Equipment

Activity 41: Prepare a budget to procure mannequins, prioritising buying low-cost mannequins (Mama Natalia and Neo Natalia) at this phase if there are financial constraints. Only 75% (n=12) saw the activity as feasible, while 25% (n=4) partially agreed with the statement. The findings suggest that the participants found this activity useful as no one disagreed with its feasibility in the programme.

The participants' comments revealed some challenges regarding the procurement of simulation equipment; however, they missed that the question required them to assess the feasibility of preparing a budget. They stated that:

"*Financial constraints will be a challenge even though the priority is low-cost equipment*." (NE2)

"*Budgetary constraints to procure equipment."* (NE12)

Researcher's lesson learned/decision: preparing a budget is the initial step to seeking financial support from internal and external organisations. Therefore, the participants need to evaluate if preparing a budget plan for procuring low-cost simulation equipment is feasible.

Activity 42: Room furnishings (e.g., beds, carts, monitors, medical instruments), only 75% (n=12) found this activity feasible, 18.8% (n=3) partially agreed, and only 6.3% (n=1) found it not feasible to prepare and plan for the furnishing of the simulation laboratory. Activity 43 had similar findings: technological devices and audiovisual systems. A total of 75% (n=12) agreed, 18.8% (n=3) partially agreed, and 6.3% (n=1) disagreed. Overall, the findings indicate that the experts consider this activity essential. However, the availability of funds was a challenge. They stated that:

"*Depending on the availability of funds".* (NE6)

"The institution would need proper infrastructure and funds to procure the furnishings". (NE10)

Researcher's lesson learned/decision: the equipment and infrastructural needs are evident in the participants' responses; therefore, strategies must be explored to secure funds for these resources.

7.6.2.2.3 Domain D: Simulation Infrastructure

Activity 51: The department should allocate premises for building a simulation laboratory or renovating/redesigning an existing structure. Only 68.8% (n=11) agreed, and 31.3% (n=5) partially agreed. The participants' responses indicated a need for infrastructure development (allocation of new space and renovation) but perceived it as challenging to achieve due to fiscal resource constraints. They stated that:

"The university should allocate the department premises since there is already a shortage of space in the existing demo labs." (NE8*)*

Another participant supported the idea of renovating the existing structure and stated:

"The building may be costly, but redesigning or renovating the current SL is challenging, especially because of space." (NE15)

Researcher's lesson learned/decision: the activity should be split into two sentences: (i) allocating new premises to build a simulation laboratory and (ii) renovating/designing the existing structure. The lesson learned is that there is a need to upgrade the simulation infrastructure in the institutions; however, funds remain a challenge. Therefore, there is a need to explore strategies to source funding and options to develop the simulation infrastructure.

Activity 52: Observation room: 56.3% (n=9) agreed that it was feasible for the NEIs to have an observation room, while 43.8% (n=7) partially agreed on the feasibility of such an infrastructure. The findings indicate that the experts were uncertain about modifying or repurposing the existing simulation laboratories due to their limited size and space challenges.

"The Midwifery department is located within a small physical space (land) and infrastructure-challenged campus of the (X) University. Having the above separate spaces [observation, debriefing and technician rooms] may not be feasible. Therefore, we use one space for all the above listed." (NE16)

"Having a building with 4 or more rooms will depend solely on space availability." (NE8)

"*The current simulation lab is too small and used by both midwifery and nursing."* (NE12).

Other comments were related to the time allocated for achieving the identified activities:

"It might take more than 6 months." (NE2)

Researcher's lesson learned/decision: The activity will be shifted to the third phase (3 to 5 years) to allow time to secure funding for building or renovating the existing simulation infrastructure. Also, the finding indicates that the identified simulation structures are missing in the existing simulation laboratories, and financial constraints remain challenging for the institutions.

Activity 53: Having a debriefing room, 50% (n=8) agreed that it was feasible to have this structure, while another 50% (n=8) partially agreed about the feasibility of the debriefing room. None of the experts consider this activity unachievable, as none selected the disagreeing option. However, space issues were the key challenge that prevented the activity from reaching a consensus.

Researcher's lesson learned/decision: Debriefing is a critical component in a clinical course, needed to facilitate learners' meaningful learning after the experience. Strategies to enhance feasibility should explored.

Activity 58: Build a simulation learning space for the programme. Only 62.5% (n=10) agreed that building a simulation space for the programme was feasible, and 31.3% (n=5) partially agreed. On the contrary, 6.3% (n=1) disagreed, claiming that it was not feasible to build a simulation laboratory. However, most participants' responses supported upgrading the existing structure rather than building a new simulation learning environment due to fiscal constraints. They state that:

"The building may be costly, but redesigning or renovating the current SL is challenging, especially because of space." (NE15)

"The available space can be upgraded because building a simulation lab can take time, looking at the financial constraints the country is faced with. Yet, it is a very important programme that must be quickly implemented for our students." (NE11)

One participant who did not have issues with space in their institution said:

"*Space may be available to build a simulation lab, but that would need much funding since the institution does not have money*." (NE1)

Researcher's lesson learned/decision: there is a need for having a standard simulation laboratory in all the institutions, but upgrading the existing infrastructure is opted for due to lack of finances. The institutions should develop plans to source funds to advance simulation laboratory infrastructure for nursing and midwifery education.

7.7 ROUND TWO DELPHI STUDY: RESULTS

The second round of the Delphi study sought to elicit expert views regarding the activities that did not reach the consensus level of 80% in the first round. Ten (10) activities from three domains: (A) Training or Preparation of Educators for Simulation, (C) Simulation Equipment and (D) Simulation Infrastructure needed a re-evaluation to decide on the framework's utility with the context. Therefore, the purpose of the second round was to re-evaluate the initial opinions on the activities that did not reach a consensus and seek advice on what can be done to enhance feasibility.

7.7.1 Sampling and Sample Size

All the experts who participated in the first round were eligible for the second round. They were considered because the second round aimed to get a follow-up response on the activities where a consensus could not be reached. Thus, total sampling was used. The response rate was excellent at 93.8% (n=15) out of 16 participants.

7.7.2 Data Collection

A data collection tool consisting of activities that did not reach the consensus level in round one was developed. The structure of the questions included the activity to be re-evaluated, comments from the first-round respondents, the researcher's comment that clarified or described the activity, and a question to guide the enquiry process. The phrase, "Please reevaluate and advise", was added to prompt an in-depth response. The data collection tool was reviewed for face and content validity by three experts and approved by the research supervisor. The data collection tool is attached in Annexure 20.

The data collection tool was emailed to all the study participants in a Microsoft Word document. The data collection process lasted seven weeks. Within this period, three follow-ups/reminders were made or sent to the participants, and the last one informed the participants about the closing date of the data collection process. Most of the responses were received after the issuing of the last reminder.

7.7.3 Data Analysis

Hsieh and Shannon's (2005) qualitative content analysis method guided the data analysis process. Upon receiving the data, all the participants' responses were copied and pasted into a new Word document. All responses for each activity were collated to facilitate a holistic view of the data as deemed by the selected data analysis approach. The data was cleaned for typos. After that, the data set was read repeatedly, and possible codes, categories and themes were deduced from the data (Annexure 27).

7.7.4 Results

The results of the activities that did not reach the consensus in round one are described under the three domains. Quotations are used to illustrate the experts' perspectives regarding re-evaluating the activities.

7.7.4.1 Domain A: Training or Preparation of Educators for Simulation

Activity 4: *Educators should be trained on how to use simulation equipment and audiovisual devices*. How can the institution ensure the availability of simulation equipment?

Please re-evaluate and advise.

Most participants perceived that activity 4 could be feasible, provided the institutions can seek local and international donor funds, meaning embarking on grant applications to procure simulation equipment and seeking help from the Ministry of Education - alternatively, requesting hospital equipment.

One expert said:

"Seek external funding from local and international companies and organisations. Locally, we can seek funding for infrastructure from companies known to support such activities, like MTN, Build It, SPTC, etc. Equipment can be sought from the UN and other similar agencies." (NE5)

Other experts shared a similar sentiment, saying:

"…..can be achieved through securing sponsorship. Hence, there is a need for proper planning and programme layout to assist in requesting sponsorship from interested personnel and companies." (NE6)

"……. equipment availability may depend on donor involvement and lobbying from the Ministry of Education." (NE7)

Promoting the feasibility of simulation-based education was also a priority to expert NE12, given the current financial crisis. The expert proposed that:

"….. donors like UNFPA and other health-related NGOs can be contacted. Once the equipment is donated, it must be distributed equally amongst the institutions." (NE12)

An alternative way of sourcing the resources for supporting simulation-based education was given by expert NE3, stating that:

"There is limited financial flexibility, where possible, loaning of equipment from hospitals could help." (NE3)

Some participants, while emphasising the need to source funding, argued that the lack of simulation equipment resources would remain a challenge unless it became an institutional management priority to effect and support funds generation strategies; they said:

"Lack of resources is a question of institutional financial management issues and priorities. Students are paying tuition partly for that specific purpose. It must be channelled appropriately for its intended use. Secondly, respective Departments, i.e..…… Administration (HODs, Deans and Directors) must proactively seek donor funds. Thirdly, adequate staffing. Academic staff, i.e. Deans, HODs and Lecturers, seem overloaded with teaching load, leaving them with no time to engage in some form of fund-generating activities." (NE1)

Activity 14: Recruitment and Training of Standardised Patients (SPs). Training educators on recruiting and training standardised patients is intended to upskill the educator; please re-evaluate and advise.

Most participants perceived this activity as feasible and provided strategies to promote the sustainability of using standardised patients, such as ensuring that educators are trained, SPs are incentivised, and students are used. However, a couple had differing views.

Participants who were positive about the need for using standardised patient expressed how this educational practice could be sustained:

"The educators will need to be trained themselves; SPs may need to be compensated for their input perhaps." (NE3)

"The use of SPs can be feasible if incentivised." NE4 Expert

NE11 echoed the others, saying:

"It may be feasible to train educators on how to recruit SPs. However, I do not see it working long-term if they have no incentives. Incentives for students may also help in retaining them as SPs." (NE11)

One expert, NE7, said:

"Training educators on SPs is feasible as long as there is a commitment to sustainability and will upskill the educator." (NE7)

The payment of standardised patients was key in this discussion to the extent that others suggested that they need to be on the Government payroll; however, one of the experts suggested a feasibility payment system:

"I agree that the educator must be trained and skilled in using simulation and recruiting standardised patients. My advice is that if patients are not willing to participate, they may be promised a small incentive like airtime." (NE15)

However, some participants felt that using SPs is not feasible due to financial implications. Others emphasise that training of educators is not a priority of the institutions but the shortage of advanced simulation equipment:

"It is a good strategy in the abstract, but infeasible and financially unsustainable in our setting. In my view, at the moment, training and/or lack of knowledge on how to use equipment is not the problem. We know how to use the few that we have. So, I maintain that training is useful but irrelevant for now until we acquire more and probably sophisticated equipment." (NE1)

Activity 19: Faculty members should obtain formal training in simulation that leads to certification (certificate, diploma/degree). The formal training that leads to certification can be through in-service training, workshops, short courses and programmes that lead to certification. It is intended for upskilling educators involved in clinical teaching and learning using simulators; please evaluate and advise.

Most participants supported the need for training educators but at the lowest level of training, in-service training, workshops, short courses-continuous professional development (CPD) rather than college or university qualifications. Stating that:

"Faculty members should get training on simulation, especially because we all have practical courses in the curriculums we teach and supervise students in the clinical area. It is feasible to conduct workshops and in-service training for all faculty, and those who require short

courses or higher certification can then do that according to their or the university's needs." (NE11)

"Education specialists in the institution may facilitate workshops and on-the-job training on simulation for educators, especially during short and long breaks when lessons are not conducted in the institution." (NE4)

"If the training is provided as CPD on the job, then it is feasible; I believe Faculty will be interested." (NE5)

Two experts, in full support of formal training of educators on simulation pedagogies, recommended that there should be an existing standard training programme for faculty development to ensure quality control:

"There should be a standardised training program which will also include a practical course; scenarios have to be included as well in these trainings." (NE13)

"Certification is required for quality assurance." (NE15)

Although most supported the training of educators on simulation pedagogies, two experts felt that formal training is not a priority for these nursing education institutions. Instead, the focus is on furnishing the simulation laboratories, given that they are clinicians:

"I maintain that training and certification do not seem essential and relevant in our current setting, given our equipment and the scope of our training. First, we advance our clinical labs and programmes, then discuss special training." (NE1)

Expert NE2 shares the same sentiment. The Expert believes that educators who are specialists in nursing or midwifery do not require formal simulation training because it is a speciality field for those who are appointed to operate the simulation centre:

"Formal training leading to certification is only necessary for the key simulators, e.g. those in charge of simulation labs; the rest of the nurse/ midwifery educators only require in-service training as every educator is responsible for student clinical practice." (NE2)

7.7.4.2 Domain C: Simulation Equipment

Activity 41: Prepare a budget to procure mannequins, prioritising buying low-cost mannequins (Mama Natalia and Neo Natalia, task trainers) at this phase if there are financial constraints. Is preparing a budget plan for procuring low-cost simulation equipment feasible? Please re-evaluate and advise.

Almost all the experts found preparing a budget to procure mannequins feasible. They commended the availability of a budget plan in the initial process of establishing a sustainable simulation programme.

"…it is feasible. Budgeting forms the beginning of establishing a simulation lab; hence, equipment can only be sourced based on a budget, and the responsible people will use the budget to seek funding." (NE2)

Another expert shared the same sentiment and highlighted a benefit it may have:

"….. having a budget is good as it is the first step in working towards ordering the needed equipment, and making the request for equipment is better than not making an effort at all." (NE9)

Although almost all the participants deemed preparing a budget to procure mannequins a feasible activity, to others, it was disconcerting to prepare a budget plan without any accessible financial support. As such, they hoped the management would take a leadership role in this regard:

"….. that is very feasible. I disagree that we totally do not have money at all. It is more about priorities. The Faculty Executive has a duty to press on the admin and make them understand the importance of that equipment in clinical teaching, and even vow not to produce results if such is not availed." (NE1)

"It is feasible; however, the issue should be prioritised by higher management." (NE3).

Another participant stated that:

"Preparing the budget is feasible once everyone involved has been made aware of its importance." (NE10)

Aside from the Faculty management, another participant felt the government should invest in the educational preparation of nursing and midwifery professionals in the country:

"Yes, it is feasible. The local government should be engaged to prioritise education. They should collaborate with its stakeholders (partners) to ensure sufficient funding for training institutions." (NE14)

Activity 42: Room furnishings (e.g., beds, carts, monitors, medical instruments). What alternative options could you suggest for your institution to acquire basic hospital/clinical equipment for the simulation laboratory? Please re-evaluate and advise:

The participants shared similar strategies regarding how funds can be made available to furnish the simulation laboratories. Most suggested grant applications, seeking donor funding, and requesting used equipment from healthcare facilities:

"We can request organisations to donate funding to source the equipment. Alternatively, we may request that private hospitals donate functional equipment they no longer use in patient care." (NE4)

"Donors and some hospitals can be contacted as equipment is kept in their storerooms and unused." (NE12)

"A financing strategy may need to be implemented to focus on simulation and room furnishing. The institutions may also need to partner with local companies to request funds from the Company's Community Service to help our institutions buy the basic equipment." (NE11)

"Grants applications and proposal writing to potential sponsors and the local government." (NE14)

Activity 43: Technological devices and audio-visual systems. What suggestion would you give to ensure the availability of funds for procuring technological devices such as computers

and audio-visual devices to advance simulation-based education in your institution? Please re-evaluate and advise.

The participants found this activity feasible to some extent. They provided practical strategies for securing funds to procure technological devices and audio-visual systems. Similar to what was proposed in earlier activities, the priority is developing proposals for grant applications to potential external sponsors, forging linkages and networks with potential funders, sharing educational resources within institutions, engaging in research activities with potential sponsors and local government, and income-generating projects.

Participant NE2 stated that:

"The departments through the university structures should develop relevant proposals for funding and submit them to the country's corporate and development partners through the Ministry of Health." (NE2)

"Grants applications, proposal writing to potential sponsors and the local government, and engaging in research work for the government and non-government organisations." (NE14)

"Engage in income-generating projects and donor funding." (NE15)

Aside from the grant applications, NE11 suggested partnering with other institutions to share available simulation resources, stating that:

"Our faculties and departments need to make deliberate partnerships and network with other universities so that we can request funding for the technological devices. Alternatively, they may help by sharing what they already have in their institutions." (NE11)

7.7.4.3 Domain D: Simulation Infrastructure

Activity 51: The department should allocate premises for building the simulation laboratory or renovating/redesigning an existing structure. How can the issues regarding the allocation of premises for the simulation learning environment be addressed within the current financial situation? Please re-evaluate and advise.

The participants perceived a need for simulation infrastructure development in all the institutions. Most participants found redesigning or repurposing existing structures more feasible than building a new simulation learning space. Moreover, a few remained uncertain about the feasibility of this activity, given the fiscal constraints of the institutions.

Those who supported renovating the existing infrastructure shared how this activity can be accomplished; they said:

"Work with the planning department/committee, share your ideas, and have a proposed plan on how the current CSL (clinical simulation learning) could be altered/renovated to enable simulation. They can come up with a budget, which will determine feasibility. (NE5)

"The current demo labs can easily be converted ….. once the decision is made. What is only required is the relevant equipment and resources." (NE2)

"A space can be created in the clinical skills lab that is currently used for demonstrations until a proper learning space is available." (NE13)

"Using existing Labs to ensure wasted space is utilised, i.e. storage or including adjacent classrooms as Lab space and involving physical planners to assist with efficiently utilising existing infrastructure by redesigning or identifying other possible spaces to accommodate the room furnishings." (NE7)

Some participants felt the institutions need new simulation structures (buildings), and some suggested how it could be done:

"The cheapest way is to buy containers that are used for building houses. It can be much cheaper for the institutions." (NE12)

"Consider prefabs." (NE13)

A few experts were uncertain about this activity's feasibility because of the financial challenges the institutions currently face. They said:

It is impossible to address the issues of premises in the current financial challenges that the institutions have. The need for funding is a priority, and institutions can avail premises if there is funding to build the simulation labs. (NE11)

"It will be subject to the availability of funds, including the time between the land allocation and the structure's building; the programme may take years to hit the ground." (NE6)

Activity 52: Observation room. How feasible is it to rearrange the layout or repurpose existing structures to create a space for the learners? Please re-evaluate and advise.

The observation room is where students can be observed without interfering with them when performing a procedure (Riabtseva et al., 2015). Differing views were shared regarding allocating space for an observation room with the simulation building due to limited space within the existing simulation laboratory and a large number of students. Also, they felt that if considered, it would reduce the training room. However, others provided working strategies on how it can be accommodated.

Those who perceived that the inclusion of an observation room was not feasible submitted that:

"I do not think it is feasible. The students are too many, and the space is too small and used for multipurpose." (NE1)

"Existing structures cannot adequately meet the simulation needs of currently enrolled students." (NE3)

"Since there is no space, it is impossible to rearrange the existing structures to create space for an observation room. We need new premises for a fully functional simulation lab." (NE11).
"It might not be possible because of their sizes. Some are congested already, thus not possible for re-arrangement. They may need enlargement to cater for more activities to benefit the learners." (NE14)

On the other hand, experts who supported the feasibility of this activity seemed to have made such considerations based on the fact that such practice is already carried out in the simulation laboratory despite the lack of a designated room:

"It is possible because that is where practical skill is taught." (NE13)

"A booth can be created, and it is feasible, I believe. Share this idea with the planning (building/civil), who can give you a valid response on such alterations." (NE5)

"It is possible to rearrange the existing structure and install a big television screen that can be used for observations." (NE4)

Activity 53: Debriefing room. Debriefing is a critical component in a clinical course, needed to facilitate learners' meaningful learning after the experience. It can take place in a classroom; please re-evaluate and advise.

A debriefing room should be equipped for short presentations with chairs and a centre table to accommodate 10 students, including technical resources (computer and a visual screen) (Riabtseva, Reynolds and Gisin, 2015). Most participants supported the feasibility of the activity; however, it may not necessarily be part of the simulation centre. Instead, available learning spaces could be used, given the size of the existing simulation laboratory.

"as much as classrooms may be used for debriefing, it takes away the experience of being in the same space where simulation took place; however, with current challenges, there are not many options besides the classroom." (NE7)

"Debriefing is important as a simulation experience can stir emotions. A classroom will not be a problem because the students have to be grouped, maybe in groups of 12, during a debriefing session as an open space is needed." (NE13)

"Since it is a critical component, it has to be done; hence, a classroom might be an option as long as it has been made conducive to suit the need." (NE15)

One participant who considered the importance of a designated simulation debriefing room said:

"The classroom can be used, though ideally, it should have a designated space to ensure privacy." (NE14)

Activity 58: Build the simulation learning space for the programme. What is your opinion regarding upgrading the existing structure than building a new simulation learning space? Please re-evaluate and advise.

The participants found upgrading the simulation structure feasible compared to building a new simulation learning environment. The basis of their responses included that upgrading saves costs and time.

"The available space can be upgraded because building a simulation lab can take time…due to financial constraints." (NE3)

Some participants suggested how the goal of upgrading the simulation laboratories can be achieved in the institution. Expert NE4 submitted that:

"The current skills laboratory may be upgraded to a simulation laboratory through the purchase of low-cost equipment or possible equipment donations from non-governmental organisations." (NE4)

The same was echoed by expert NE 2, who further explained the process:

"The infrastructure can be improved through the national budget (note that this mainly depends on how the departments, through the Dean's office, develop the plan, proposed budget, and project proposal for funding). The country's development partners can come through for equipment, especially if the departments submit proposals through the relevant university structures." (NE2)

7.7.5 Final Implementation Plan of the Simulation Framework

The Delphi study findings showed that the activities to consider when integrating simulation into the Bachelor of Nursing Science in Eswatini were relevant in the first round. However, the feasibility of all the activities was established after the re-evaluation process and the probing of strategies that could be initiated to be ready to integrate simulation into the nursing

programme. Financial constraints were the main reason some of the activities in Domain A- training or preparation of educators, Domain C- simulation equipment, and Domain D simulation infrastructure were not considered feasible.

The modification of activities affected those that required financial support listed in phase one (first six months) to give the institutions time to work on the budget plan and implement the strategies for sourcing funding for the simulation resources. Additionally, some activities were added using the strategies recommended during the second round of the Delphi study. The changes and additions are highlighted in a green highlighter.

Table 7.3 Final Implementation Plan of the Simulation Framework

Phase I **(First 6 months)**	**Phase II** **(7 months to 2 years)**	**Phase III** **(3 to 5 years)**
Domain A: Training or preparation of educators: to ensure that they are aware of the concept of simulation knowledge, implementation processes and principles		
• Identify simulation champions and train them first via an online course. • Identify the strengths of existing educators and train them according to their needs. • Develop a training programme that is accessible to all staff: — Learn how to develop students' objectives. — Learn about simulation fidelity. — Learn about prebriefing students. — Learn about formulating, implementing and facilitating a simulation scenario. — How to facilitate a debriefing session, provide student feedback, and evaluate student performance.	• Educators will be trained on how to use simulation equipment and audio-visual devices. • Trained staff members will be supported to implement possible simulation experiences using available resources. • Develop a simulation scenario template. • Identify and contextualise debriefing tools. • Develop evaluation instruments. • Recruit and train standardised patients (SPs). • The institution should consider membership to a recognised simulation organisation, such as the Society for Simulation in Healthcare, for support and resource access. • Develop a simulation community to share practices.	• Ensure ongoing faculty development and support of staff engaged in simulation. • Orient and train new staff members. • Faculty members should obtain formal training in simulation that leads to certification (certificate, diploma/degree).
Domain B: Integration of Simulation into the Midwifery Programme: Align Programme Outcomes		
• The Midwifery department should collaborate with management and relevant stakeholders to incorporate SBE into the institution's strategic plan.	• The Midwifery Department will appoint a subcommittee to revise the existing curriculum to integrate simulation. • The Midwifery Department will identify the programme goals for simulation learning.	• Review the Midwifery simulation programme. • Expand the goal of simulation learning into other programmes, such as general nursing.

• The Department of Midwifery will liaise with the institution's management and ensure a written commitment to SBE. • Develop a business plan for the simulation programme to attract grants/funding.	• The subcommittee will develop guidelines, protocols, policies and procedures for guiding simulation learning. • The subcommittee would lead the development of simulation scenarios for teaching midwifery skills. To develop the midwifery simulation scenario, members should include the course lecturer, one or two other lecturers, a clinical instructor, a clinician, simulation experts/champions, and researchers.	• Revise the General Nursing curriculum and incorporate simulation-based education programme outcomes.
Domain C: Simulation equipment: educational resources that would be used to develop the student competencies in readiness for clinical practice		
• The Midwifery Department subcommittee will conduct a needs assessment to identify the necessary equipment resources for the Midwifery programme. • Prepare a budget plan for procuring equipment, such as — Simulation equipment, — Clinical equipment — Technological devices • Apply for grants to procure equipment.	• In fiscal constraints, consider: — Purchasing low-cost mannequins such as Mama Natalia and NeoNatalia. — Used or donated clinical equipment. — One or two technological devices. — Share equipment with other institutions.	• Consider procuring additional mannequins, considering the number of students and programme/training needs. • High-fidelity mannequins can be procured based on assessed need.
Domain D: Infrastructure: a physical place for simulation learning for the Midwifery programme		
• The department should benchmark for a simulation laboratory/centre infrastructure plan or buy an existing simulation centre plan if building a new simulation learning environment is planned. • Liaise with the physical infrastructure development committee for additional space that could be used for simulation learning, such as a debriefing room and standardised patient room. • The department or the institution should prepare a budget plan that will finance the following physical features of a standard simulation learning environment if redesigning the existing infrastructure is considered: — Observation room — Debriefing room — Standardised patient room	• Identify the location of the building premises of the simulation centre. • Apply for funding for: — Redesigning the simulation laboratory to accommodate the essential rooms, such as observation, debriefing, standardised patient, store room and computer room — Repurposing structures — Prefabs and containers — or building the simulation centre/laboratory.	• Build the simulation learning space for the programme.

— Storeroom. — Computer room.		
Domain E: Student/Simulation Participants: students are key stakeholders; they should be clear about their roles in simulation learning.		
• Conduct needs assessment to establish students' attributes and simulation expectations.	• Introduce students to formal simulation-based learning (prebriefing and debriefing processes). • Pilot test simulation scenarios before engaging students in the learning process. • Student to sign contractual confidentiality document.	• Conduct pre and post-tests to evaluate the simulation programme.

7.8 CONCLUSION

This chapter evaluated the utility of the framework within the Eswatini context. The participants' responses showed that it is practical to use this framework to guide the integration of simulation in the nursing programme. The next chapter presents a summary of this study.

CHAPTER 8: SUMMARY, LIMITATIONS, RECOMMENDATIONS, AND CONCLUSION

8.1 INTRODUCTION

This chapter presents a study summary, describing the main findings and limitations. The recommendations for nursing education, research, and practice are described, and the conclusion of this study is presented.

8.2 SUMMARY

Nursing education institutions in Eswatini currently use simulation to prepare students for clinical practice. However, there is no framework to guide the Eswatini educators in integrating simulation into the nursing programme. The lack of a framework is characterised by unstandardised educational practices and underutilisation of this pedagogical approach, resulting in minimal achievement of simulation effect on students, patients and systems outcomes. Hence, the study was undertaken to develop a framework to guide Eswatini nurse educators in integrating simulation into the Bachelor of Nursing Science programme. Hence, the study was undertaken to develop a framework to guide Eswatini nurse educators in integrating simulation into the Bachelor of Nursing Science programme.

The question: "*What evidence and processes can inform the development of a framework to guide nurse educators in integrating simulation into the Bachelor of Nursing Science programme in Eswatini?"* was answered using a mixed methods research approach. Furthermore, a multilevel mixed design was employed to generate evidence from a scoping review, survey, iterative process and a Delphi process to address the study objectives, sequenced into four phases.

Developing the framework began with searching the literature for evidence-based practices in simulation and assessing the state of simulation use in Eswatini, guided by independent objectives. A systematic review using the scoping review approach was the first phase of this study to answer the objective: "*To explore existing literature on best practices of simulation-based education in the educational preparation of undergraduate nursing students locally (Sub-Saharan Africa) and internationally*." Sixty (60) literature sources were drawn from five databases: Science Direct, Cumulative Index to Nursing & Allied Health

(CINAHL), Sage Journals, Wiley Online Library, and the Education Resources Information Centre (ERIC) and guided by inclusion criteria. Independent reviewers conducted the data extraction process. The research supervisor, who served as the third reviewer, resolved conflicts on differing decisions amicably. A qualitative content data analysis by Hsieh and Shannon (2005) was used to infer the meaning of the findings, representative codes, and categories that emerged from the study. The evidence in the scoping review enabled the researcher to learn about the ideal simulation practices that are internationally recognised.

In phase two, the objective was to assess the current state of simulation use in the educational preparation of Bachelor of Nursing Science Students in Eswatini. This objective was achieved by auditing the simulation centres/laboratory resources, together with a survey to seek educators' perspectives. The mixing of multiple levels of data occurred after the interpretation of these parallel studies' findings. Meta-inferences were drawn from each study's findings and presented as lessons learned, which were integrated to serve as data sources to be used in phase three. The census (total) sampling technique was used because the population of educators in Eswatini are less than 200. The population of nurse educators in all three nursing education institutions that offer the Bachelor of Nursing Science programme were (N=49). A returned sample size of (n=46) was obtained in the survey study.

The three NEIs simulation centres/laboratories were audited. Two laboratories were found in one study setting (n=4). Data collection tools were adapted and tested for content and face validity. A self-administered questionnaire yielded findings that informed about the state of simulation use in Eswatini; it provided background issues that served as rationales for the recommended aspects of the framework.

In phase three, the objective was to develop a framework for integrating simulation into the Bachelor of Nursing Science programme in Eswatini, using an iterative process as an inquiry method. Two simulation and nursing education experts within the Southern Africa and International contexts developed the framework for integrating simulation in Eswatini using the integrated meta-inferences drawn in phases 1 and 2 guided by the NLN Jeffries Simulation Theory. A phase-based framework implementation plan was developed to guide

users. Its content was used to develop a survey questionnaire administered in phase four to test the product.

In phase four, the objective was to evaluate the framework for clinical utility in preparing Bachelor of Nursing Science Students in Eswatini, and it was conducted using the Delphi methodological approach. The Delphi study was completed in two rounds using a self-administered questionnaire. Eswatini nurse educators involved in clinical teaching (n=16) round one and round two (n=15) evaluated the framework for relevance and feasibility to establish its utility in the educational system because they would not adopt it if it were not reasonable. Data from round one was analysed using SPSS to generate the count and percentage of each variable. Ten (round one) of the activities in Domains A, D and C could not reach the 80% consensus rate on the feasibility component. Round two consisted of structured questions using the items that did not meet the feasibility criterion to seek re-evaluation and advice on achieving feasibility in the setting. Data were analysed qualitatively using the content analysis method. The Eswatini nursing experts recommended meaningful strategies to achieve feasibility in all the activities, which signifies positivity towards the framework. The data was used to modify the related components in the framework.

8.3 MAIN FINDINGS

A gap in simulation research was noted during the scoping review. One of the scoping review inclusion criteria was to source literature locally in sub-Saharan Africa and internationally. However, the scoping review was widely informed by Western (international literature), 95%, while the African context only contributed 5%. Therefore, this study's subsequent phases are more important to ensure the framework is contextually relevant.

The scoping review inquiry led to the discovery of four essential elements to integrating simulation into an educational programme. They are (i) lecturer preparation, (ii) student elements, (iii) designing simulation and (iv) innovations in simulation. Each element has sub-elements that must be adhered to when planning to embed simulation into an education programme.

Phase two: the state of simulation use in Eswatini was established using two data sources/levels: auditing the simulation centres/laboratories and a survey with educators. The

data from this phase provided insightful information about the characteristics of the Eswatini nursing education context concerning simulation use. Thus, it served as a guide for developing a contextually relevant framework. The unique features of the Eswatini nursing education context regarding simulation use are highlighted below.

Results from auditing the simulation laboratories showed that no educators are formally trained in the principles of simulation pedagogies. However, some have acquired some knowledge of certain aspects, such as developing evaluating tools, using task trainers and medium fidelity equipment through in-service training, reading literature and during nursing education training. None were trained in integrating simulation into the curriculum and planning and implementing simulation that covers the design elements. The findings show better commitment towards providing infrastructure and equipment (63%) needed to support simulation learning. Moreover, the financial and resource plans are barely made, indicated by a score of 54%.

Educators survey revealed that the Eswatini nursing education institutions were somewhat ready for simulation, meaning they were at a 3 on a Likert scale of 1 to 5 = (60%) state of readiness. The finding indicates that the institutions were ready but not actively integrating simulation into the Bachelor of Nursing Science programme.

Areas that needed immediate interventions when developing the framework included the lack of evidence of a clearly defined need to support simulation integration in the existing Bachelor of Nursing Science programme. The hindering factors were the lack of (a) a clear strategic vision for SBE, (b) a written commitment to SBE, and (c) funding to support the commitment to SBE. Readiness for culture change was compromised as well by the (a) lack or absence of credentialed staff members, (b) lack of personnel to model SBE best practices and (c) lack of access to librarians to assist in searching for simulation resources.

The survey results also showed that much effort is needed in allocating time, personnel, and resources to ensure readiness. The hindering factor was the lack of fiscal resources to support educators' training and time to integrate SBE and develop physical learning spaces and equipment. Also limited or absent were access to quality technology, support to learn

and manage technologies that support education, and simulation champions among the management, clinicians, technology specialists, administrative assistants, and support staff. Additionally, factors that promote sustainability to embed culture were partly embraced in the Eswatini nursing education context, missing clinicians and management in decisions regarding simulation-based education.

Phase three was the development of the framework for integrating simulation into the Eswatini Bachelor of Nursing Science programme. It has five domains: Training or preparation of educators; Integration of simulation into the nursing/midwifery programme; Simulation equipment; Simulation infrastructure; and Student/simulation participants. It consists of activities that should be implemented over three phases. The experts recommended the phase-based approach due to fiscal resource constraints surrounding the Eswatini context, beginning with one programme. The programme was Midwifery because it had better resources than the general nursing programme. Phase one included activities to be achieved within 1-6 months, phase two included those to be achieved within 7 months to 2 years, and the last phase had activities planned to be achievable within 3 to 5 years.

Faculty preparation (training) on principles of SBE educational practices, identification and training of simulation champions and financial support to address equipment and infrastructure development were included in the list of activities to be addressed in the framework implementation plan proportionate to the Eswatini background issues. The recommended plan included identifying at least one personnel to be trained as a simulation champion to assist in modelling SBE best practices and enhance simulation growth. Faculty training in the first phase of the implementation plan was to be undertaken per rising need, and certification can be prioritised as commitment increases. A grant application was proposed to meet fiscal resources to support SBE. However, a budget plan informed by a need assessment and programmed objectives was the first step in the initial process to avoid spending money on non-priority resources (remaining in boxes) and to be used as part of a motivation letter for a grant application. Additionally, purchasing low-fidelity mannequins was suggested as a short-term goal in case of limited funding.

In phase four, the framework was evaluated for clinical utility by Eswatini nursing educators. The implementation plan was found relevant. However, in 10 activities, feasibility could not be reached in the first round due to fiscal constraints. After re-evaluating, the Eswatini educators suggested strategies that could increase the feasibility. The strategies included engaging management to increase commitment to SBE, developing a budget plan, and seeking funding for procuring equipment and infrastructure development.

8.4 LIMITATIONS OF THE STUDY

There was no literature in Eswatini on best practices in simulation-based education that would have been used to inform the framework. Data was also limited within the African context, resulting in increased reliance on international literature. Therefore, there is a possibility that the scoping review's findings contained practices unsuitable for the Eswatini context.

The survey questionnaire used to obtain data about the state of simulation use in Eswatini had highly closed-ended questions. However, the problem is that some of the participants responding had limited insight or knowledge of simulation. It is possible that using these types of questions hindered potential responses that would have been useful in understanding the state of the simulation in this context.

The sample size of the experts who developed the framework was too small while having more than two is believed to have strengthened this study's output. However, this was not done due to financial constraints, accessibility, and difficulty in establishing and identifying international experts.

In the Delphi study, participants' responses were only limited to accessing the relevance and feasibility of the framework and giving a comment if they partially agreed or disagreed. That may have forced others to agree to avoid explaining why not if they have chosen the other options; therefore, this implies social desirability bias.

Social desirability might have happened in the Delphi study inadvertently. The participant information sheet stated that another round of data collection would follow if the 80% consensus was not reached. Some participants might have agreed to avoid being part of the next round.

8.5 RECOMMENDATIONS

The section covers recommendations useful to nursing management, education, research and practice regarding simulation-based education.

8.5.1 Nursing Management

- The findings of the study indicated that the Eswatini nursing education institutions are somewhat ready for integrating simulation. Therefore, there is a need for additional effort to integrate simulation into the nursing programme fully. It is recommended that the deans and senior management make use of the framework implementation plan to be guided on the process of creating a culture that is supportive of simulation-based education at all levels: institution, faculty and programme and the guiding philosophies.

- This study's findings will inform the deans and other members of senior management of the study's outcomes to incentivise them to make human resources and financial resources available for establishing well-equipped simulation laboratories.
- The managers of the nursing and midwifery departments need to investigate ways of adapting the simulation laboratories for more optimal use of simulation.

- The Eswatini Nursing Council Board is responsible for regulating nursing education and practice to protect the public from unsafe practices. The framework's components could be used to evaluate the quality of clinical education. Also, once the institutions have integrated simulation, it can offer the Eswatini Nursing Council an opportunity to evaluate the students' clinical competencies before licensure in addition to the written exam.

8.5.2 Nursing Education

- Nurse educators need training to fully understand the processes involved in designing, implementing, and evaluating simulation to realise its potential benefits in the educational preparation of prelicensure nurses.
- A targeted training programme for nurse educators that concentrates on the aspects that must be included and should be developed.
- Students need an orientation and preparation to embrace the aspect of the simulation learning experience.

8.5.3 Nursing Research

- Implementing this research framework will provide an opportunity to evaluate its effect in advancing simulation learning and improving outcomes for students, patients and the system.
- There is a need for a publication of simulation experiences in sub-Saharan Africa.

8.5.4 Nursing practice

- The clinicians/clinical nurses should be invited by faculty to develop simulation scenarios based on reality.
- Clinicians should be equipped with simulation debriefing and evaluation techniques.

8.6 CONCLUSION

In Eswatini, the simulation-based education teaching and learning modality is somewhat embraced. The findings of this study showed some challenges and gaps in the application processes. However, they are workable and require effort from all nursing education stakeholders to achieve the optimum benefits of simulation. Obtaining the maximum benefits of simulation requires readiness for culture change, commitment, knowledge, and skills to integrate simulation into the nursing programme (Humphreys, 2013; Tjoflåt and Våga, 2017).

Evidence from the literature shows that simulation can enhance the provision of high-quality clinical learning experiences (Hayden et al., 2014) and effectively blends with the competency-based approach (Larue et al., 2015). The Eswatini Nursing Council developed

a framework that outlines entry-to-practice competencies and introduced an exam in response to the identified preparatory deficiencies of newly graduated nurses (USAID, 2015). Moran et al. (2018) said simulation should not be perceived as an add-on teaching strategy to combat the declining quality of clinical learning experiences. Therefore, the framework developed in this study is believed to be an essential tool in guiding the integration of simulation into the educational preparation of the Bachelor of Nursing Science programme in Eswatini and similar contexts.

Various challenges compromise the Eswatini nursing education clinical learning environment. Nursing students compete for clinical placements due to increased student intakes compounded by issues of maldistribution of students and the limited availability of clinical supervisors and preceptors, resulting in fewer opportunities to develop clinical competencies. Despite these challenges that face clinical education, the Eswatini nursing education system still relies on passive educational strategies and an apprenticeship model. The apprenticeship model is an approach that allows students to gain clinical experience in natural clinical settings (hospitals, clinics and community) (Glen, 2009).

There is increasing evidence about the effects and benefits of using simulation in nursing education amid the challenges that face clinical education. Nevertheless, simulation should not be used as an add-on strategy to achieve its outcomes: student competencies, patient safety and systems outcomes. It must be integrated into the nursing programme. However, there was no framework to guide the Eswatini nursing educators/institutions'' management on the process of integrating simulation into the nursing programme. Without the framework, educators will continue using passive educational strategies and the compromised apprenticeship model. As a result, concerns about graduates who are not ready for professional practice work, lack of clinical competencies that are essential for improving patient healthcare outcomes and issues of confidence would be ongoing due to lack of practice during the education preparation period. The framework, it is believed, will contribute to advancing clinical education in Eswatini. Findings from the survey showed that the Eswatini nursing education institutions were somewhat ready for simulation. Therefore, this framework will guide nurse educators and institutions' management on what to prioritise and how to get started with the process of integrating simulation into a programme.

Currently, the Eswatini clinical education is characterised by passive teaching methods. One of the framework's components is the training/educational preparation of educators. It is believed that this framework would raise the awareness of educators and institution management about the need to be upskilled on the simulation pedagogies, which are inherent to active learning methods.

The Eswatini nursing education system is challenged with a shortage of clinical placement sites, a lack of clinical supervisors, and limited opportunities for students to engage in patient care due to the influx of students in clinical practice. The framework guides the education institutions on the resources (human and equipment) and infrastructure that should be secured to create an authentic clinical learning environment (simulation centre) for students to learn, practice and develop clinical competencies in a safe learning environment. Also, this learning environment will offer educators the opportunity to standardise clinical learning for all students to receive similar educational preparation experiences that are tailored to meet the programme outcomes and evolving public healthcare needs.

The framework provides guidance that is beneficial to students. Student roles and responsibilities are specified in the framework. They will enable students to develop nursing competencies and self-confidence in managing low and high-risk emergencies and rare skills when applied during a simulation scenario, thus ensuring patient safety.

The evidence that informed the development of the framework for integrating simulation in Eswatini was informed by a systematic scoping review and survey study that assessed the state of simulation use in the country. The latter study included the assessment of the resources in simulation laboratories and the educators' perspectives.

The scoping review yielded literature on best practices in simulation-based education, which included four themes: lecturer preparation, student elements, designing simulations and innovations in simulation. These best practices were mainly extracted from international literature (95%), while only 5% were from the sub-Saharan Africa context. Swart, Duys and Hauser (2019) reported a similar gap despite noticeable increases in simulation use in South Africa. The cause of this gap is unknown. However, the scoping review findings were

valuable evidence as the data has informed about the idea practices inherent in simulation-based education:

The findings have informed that simulation experiences must be facilitated by an educator/lecturer/faculty/instructor trained in simulation pedagogies, processes and principles. The highlighted rationales include (a) educating lecturers/educators on integrating simulation into the nursing programme (Jeffries et al., 2015) to achieve quality simulation (Bryant et al., 2020; McFaden, 2020); (b) developing knowledge and skills in implementing, designing and evaluating processes in a simulation programme (Alexander et al., 2015; Jeffries et al., 2015; Beroz, 2017; White, 2017; Dale-Tam et al., 2021; Herlihy, 2022); (c) learning about educational practices that contribute to positive outcomes with simulation; and (d) being equipped with the functional roles of the educator/facilitator for simulation-designated outcomes to be achieved (Kostovich, O'Rourke and Stephen, 2020; Davies et al., 2021; Herlihy, 2022).

Students are active participants in the simulation learning environment. Evidence showed that their learning is influenced by mainly modifiable factors, regulated by the lecturer, and then non-modifiable factors within the student control (Jeffries, 2005a, 2021; Adamson, 2015; Jeffries et al., 2015). Hence, an educator trained and skilled in simulation educational practices and principles is required (INACSL Standards Committee, 2016c). Elements to consider for students to achieve optimal learning through simulation that emerged from this scoping review include (i) student preparation, (ii) selection of appropriate instruction methods, (iii) clear student roles and responsibilities in all phases of simulation learning, and (iv) student outcomes or competencies to be gained.

Learning through simulation is guided by a specific design; all simulation experiences (i) must have clear learning objectives, (ii) be scenario-driven, (iii) begin with pre-briefing, (iv) have appropriate fidelity, (v) have a debriefing session and (vi) evaluation of processes (Adamson, 2015; Jeffries et al., 2015; INACSL Standards Committee, 2016c, 2016a; Jeffries, 2021). In simulation-based education, objectives guide all the design elements: type of scenario to be selected, pre-briefing content and material, type of physical fidelity level (equipment and environment) and psychological fidelity (Adamson, 2015; Alexander et al., 2015; Jeffries, Rodgers and Adamson, 2015); additionally, the type of debriefing techniques

and processes (Fanning and Gaba, 2007; Decker et al., 2013) and the type of evaluation process (Sando et al., 2013)

Debriefing is the phase where learning takes in simulation-based education (Decker et al., 2013; Jeffries et al., 2015; INACSL Standards Committee, 2016d; Davis et al., 2018; Reibel, Cason and Screws, 2019; Dale-Tam, Menard and Posner, 2021). It must be conducted by a facilitator trained in using debriefing frameworks/techniques (INACSL Standards Committee, 2016c; Sawyer et al., 2016). Without debriefing, students would unknowingly transfer an error into practice, thus compromising quality patient care and safety (Decker et al., 2013).

Evaluation and feedback are other core design elements. The scope of what should be evaluated in simulation learning is broad; it consists of evaluating student performance (formative, summative or high stakes), the facilitator's/simulation staff competencies and the quality of the simulation scenario/learning experience (Sando et al., 2013; Beroz, 2017; Zitzelsberger et al., 2017; Bryant et al., 2020; Grota et al., 2020; Piot et al., 2021). The reasons for evaluation are beneficial to the individual and the system. Evaluating students is essential for improving performance, certification or testing competency (Sando et al., 2013). Assessing the facilitators' competency in debriefing is one way of measuring the quality of the simulation learning experience (Jeffries, Dreifuerst, Kardong-edgren et al., 2015). Evaluating the programme helps identify irregularities within the simulation programme practices (Beroz, 2017). The evaluation instruments must be valid and reliable (Boese et al., 2013; Jeffries et al., 2015; Beroz, 2017).

Simulation has advanced, and rigorous research evidence has informed the growth and development. Reputable leaders and organisations, such as the World Health Organisation, recognise and endorse the use of simulation in nursing and midwifery education (WHO, 2013; Martins, Baptista, Coutinho, Fernandes and Fernandes, 2018); the National League for Nursing (NLN) supported research in simulation dated 2003 and participated in developing the first framework for guiding simulation use in nursing education (Jeffries, 2005, 2021; NLN, 2015; Poindexter, 2021). The National Council of State Boards of Nursing (NCSBN) in the United States of America also generated evidence that should guide the application of simulation in nursing. A longitudinal, randomised, controlled study was

conducted following requests from nursing institutions to replace traditional clinical hours due to challenges in securing clinical placement in healthcare settings, supervision issues linked to high student intakes, restrictions associated with patient safety, ethics and litigations, and decline in competency among new graduates was conducted (Hayden et al., 2014). Most healthcare educational institutions in various countries, including Eswatini, are faced with these challenges.

The findings indicate that the institutions were somewhat ready but not actively integrating simulation into the Bachelor of Nursing Science programme. The situation is attributed to the lack of trained nurse educators/lecturers and simulation champions, the lack of a clearly defined need for simulation in the existing Bachelor of Nursing programme and support from management. Other challenges that contribute to the state of simulation use in Eswatini are the limited availability of budget planned for funding simulation equipment (mannequins, scenario software, audio-visual devices) and underdeveloped simulation learning space (lack of critical rooms, such as debriefing, storeroom, observation room). The lack of organisational or leadership support hinders simulation integration, effective use and advancement (Motola et al., 2013; Nehring, Hughes and Greenwell, 2013; Taplay et al., 2014, 2015; Munangatire and Naidoo, 2017; Schneidereith, Leighton and Foisy-Doll, 2020).

Issues of human resources for simulation are a concern in Eswatini. It is highly recommended to have simulation champions. These personnel are responsible for guiding and modelling SBE to other staff, assisting with continuing faculty development, supporting educators/lecturers throughout the simulation experience and getting the faculty's and the management's buy-in (Nehring, Hughes and Greenwell, 2013; van Vuuren, Seekoe and Goon, 2018; Sawaya et al., 2021).

The availability of physical/equipment resources, human resources (trained educators) and champions are integral to successfully integrating simulation into the healthcare programme (Foisy-Doll and Leighton, 2017a; Leighton, Foisy-Doll and Gilbert, 2018; Leighton et al., 2020; Schneidereith, Leighton and Foisy-Doll, 2020). Additionally, factors that promote sustainability to embed culture were partly embraced in the Eswatini nursing education context. The analysis of the findings showed that clinicians and management were not

involved in decisions regarding simulation-based education SBE. Leighton et al. (2020) alluded that it leads to failure to benefit from simulation-based education.

The experts used findings from lessons learned from meta-inferences of the mixed parallel studies qualitative (scoping review) + quantitative (survey) as the data source. The experts suggested the integration process should be in phases, “starting small” with one programme due to fiscal resource constraints surrounding the Eswatini context. The initial phase should last the first six months, the second phase from 7 months to 2 years, and the final phase from 3 to 5 years. Activities to be accomplished during each phase were identified and guided by the NLN Jeffries and the lessons learned. The activities were categorised under five domains: (a) Training or preparation of educators; (b) Integration of simulation into the nursing/midwifery programme; (c) Simulation equipment; (d) Simulation infrastructure; and (e) Student/simulation participants. These are thematic areas identified during the analysis of the lessons learned.

Midwifery was chosen because it had better resources than the general nursing programme. The implementation approach aligns with the literature. Some indicate that it is not a once-off event, but institutions should expand it gradually (Foisy-Doll and Leighton, 2017a). Others emphasise similar points to prevent failure, emphasising that integration should be taken slowly in a phase-based approach (Alexander et al., 2015).

Faculty training in the first phase of the implementation plan was to be undertaken per rising need, and certification can be prioritised as commitment increases. A grant application was proposed to meet fiscal resources to support SBE.

REFERENCES

Abdelmegid, M.A. González, V.A., Poshdar, O'Sullivan, M., Walker, C.G., and Ying, F. (2020) 'Automation in Construction Barriers to Adopting Simulation Modelling in Construction Industry', *Automation in Construction*, 111(December 2019), p. 103046. Available at: https://doi.org/10.1016/j.autcon.2019.103046.

Adam, A.M. (2020) 'Sample Size Determination in Survey Research', *Journal of Scientific Research and Reports*, 26(5), pp. 90–97. Available at: https://doi.org/10.9734/jsrr/2020/v26i530263.

Adamson, K. (2010) 'Integrating Human Patient Simulation into Associate Degree Nursing Curricula Faculty Experiences, Barriers, and Facilitators', *Clinical Simulation in Nursing*, 6(3), pp. e75–e81. Available at: https://doi.org/10.1016/j.ecns.2009.06.002.

Adamson, K. (2015) 'A systematic review of the literature related to the NLN/Jeffries simulation framework', *Nursing Education Perspectives*, 36(5), pp. 281–291. Available at: https://doi.org/10.5480/15-1655.

Aebersold, M. (2018) 'Simulation-based learning: No longer a novelty in undergraduate education', *Online Journal of Issues in Nursing*, 23(2), pp. 1–1. Available at: https://doi.org/10.3912/OJIN.Vol23No02PPT39.

Akhtar-Danesh, N., Baxter, P., Valaitis, R.K., Stanyon, W. and Sproal, S. (2009) 'Nurse faculty perceptions of simulation use in nursing education', *Western Journal of Nursing Research*, 31(3), pp. 312–329. Available at: https://doi.org/10.1177/0193945908328264.

Akhter, Z., Malik, G. and Plummer, V. (2021) 'Nurse educator knowledge, attitude and skills towards using high-fidelity simulation: A study in the vocational education sector', *Nurse Education in Practice*, 53(March), p. 103048. Available at: https://doi.org/10.1016/j.nepr.2021.103048.

Al-Ghareeb, A.Z. and Cooper, S.J. (2016) 'Nurse Education Today Barriers and enablers to the use of high- fidelity patient simulation manikins in nurse education : an integrative review', *YNEDT*, 36, pp. 281–286. Available at: https://doi.org/10.1016/j.nedt.2015.08.005.

Alconero-Camarero, A.R., Sarabia-Cobo, C., Catalan-Piris M.J., Gonzalez-Gomez, S. AND Gonzalez-Lopez, J.R. (2021) 'Nursing students' satisfaction: A comparison between medium-and high-fidelity simulation training', *International Journal of Environmental Research and Public Health*, 18(2), pp. 1–11. Available at: https://doi.org/10.3390/ijerph18020804.

Alexander, L., Sheen, J., Rinehart, N., Hay, M. and Body L. (2018) 'Mental Health Simulation With Student Nurses: A Qualitative Review', *Clinical Simulation in Nursing*, 14, pp. 8–14. Available at: https://doi.org/10.1016/j.ecns.2017.09.003.

Alexander, M., Durham, C.F., Hooper, J.I., Jeffries P.R., Goldman, N., Kardong-Edgren, S, Kesten, K.S., Spector, N., Tagliareni, E., Radtke, B. and Tillman, C. (2015) 'NCSBN Simulation Guidelines for Prelicensure Nursing Programs', *Journal of Nursing Management*, 6(3), pp. 39–42. Available at: https://doi.org/10.1016/S2155-8256(15)30783-3.

Amod, H.B. and Brysiewicz, P. (2019) 'Promoting experiential learning through the use of high-fidelity human patient simulators in midwifery: A qualitative study', Curationis, 42(1), pp. 1–8. Available at: https://doi.org/10.4102/curationis.v42i1.1882.

Andersen, P., Guinea, S., Reid-Searl, K. and Levett-Jones, T. (2021) 'Designing Tag Team Patient Safety Simulation: An instructional design approach', *Clinical Simulation in Nursing*, 59, pp. 1–9. Available at: https://doi.org/10.1016/j.ecns.2021.05.001.

Anderson, J.D.M., Aylor, M.E. and Leonard, D.T. (2008) 'Instructional design dogma: Creating planned learning experiences in simulation', *Journal of Critical Care*, 23(4), pp. 595–602. Available at: https://doi.org/10.1016/j.jcrc.2008.03.003.

Angelina, J.A., Stephen, K.M. and Ipyana, M. (2021) 'The Impact of Low Fidelity Simulation on Nurse Competence in Active Management of Third Stage of Labor: An Intervention Study

in Primary Health Care Settings in Tanzania', *Clinical Simulation in Nursing*, 56, pp. 10–21. Available at: https://doi.org/10.1016/j.ecns.2021.03.009.

Arksey, H. and O'Malley, L. (2005) 'Scoping studies: Towards a methodological framework', *International Journal of Social Research Methodology: Theory and Practice*, 8(1), pp. 19–32. Available at: https://doi.org/10.1080/1364557032000119616.

Arthur, C., Levett-Jones, T. and Kable, A. (2013) 'Quality indicators for the design and implementation of simulation experiences: A Delphi study', *Nurse Education Today*, 33(11), pp. 1357–1361. Available at: https://doi.org/10.1016/j.nedt.2012.07.012.

Awogbemila, T. (2018) *Assessing Staff Readiness for Simulation in a Health Sciences Institution*. University of the Witwatersrand. Available at: http://wiredspace.wits.ac.za/bitstream/handle/10539/25429/Awogbamile.researchreport.pdf?sequence=1&isAllowed=y.

Baayd, J., Heins, Z., Walker, D., Afulani, P., Sterling, M., Sanders, J.N. and Cohen, S. (2023) 'Context Matters: Factors Affecting Implementation of Simulation Training in Nursing and Midwifery Schools in North America, Africa and Asia', *Clinical Simulation in Nursing*, 75, pp. 1–10. Available at: https://doi.org/10.1016/j.ecns.2022.10.004.

Bartlett, J.E., Kotrlik, J.W. and Higgins, C.C. (2001) 'Organizational Research: Determining Appropriate Sample Size in Survey Research', *Information Technology, Learning, and Performance Journal*, 19(1), pp. 43–50. Available at: https://www.opalco.com/wpcontent/uploads/2014/10/Reading-Sample-Size1.pdf.

Benner, P., Sutphen, M., Leonard, V. and Day, L. (2010) *Educating Nurses: A Call for Radical Transformation*. 1 edition. San Francisco: Jossey-Bass.

Benner, P., Hoopet-Kyriakidis, P.L. and Stannard, D. (2011) 'Clinical Wisdom and Interventions in Acute and Critical Care', in *A Thinking-in-Action Approach*. Second Edi. New York: Springer Publishing Company, LLC, pp. 1–50.

Benner, P., Kyriakidis, P.H. and Stannard, D. (2011) *Clinical Wisdom and Interventions in Acute and Critical Care: A Thinking-in-Action Approach*. 2nd ed. New York: Springer Publishing Company, LLC.

Bennett, J. and Dangerfield, C. (2021) 'Optimizing Nursing Response to Crisis Events through In-Situ Simulation', *MedSurg Nursing*, 30(2), pp. 108–137.

Beroz, S. (2017) 'A Statewide Survey of Simulation Practices Using NCSBN Simulation Guidelines', *Clinical Simulation in Nursing*, 13(6), pp. 270–277. Available at: https://doi.org/10.1016/j.ecns.2017.03.005.

Bevan, A.L., Rosalyn, J., Keeley, S. and Brown, P. (2015) 'Learning to Nurse: Developing knowledge and skills for practice', *British Journal of Nursing*, 25(15), pp. 781–785. Available at: https://doi.org/doi: 10.12968/bjon.2015.24.15.781 Bulman,.

Biesta, G. (2010) 'Pragmatism and the Philosophical Foundations of Mixed Methods Research1', in A. Tashakkori and C. Teddlie (eds) *In: SAGE Handbook of Mixed Methods in Social & Behavioral Research*. 2nd ed. Thousand Oaks: SAGE Publication, Inc. Available at: https://doi.org/10.4135/9781506335193.

Billings, D.M. and Halstead, J.A. (2016) *Teaching in Nursing: A Guide for Faculty*. 5th ed., *Nursing Standard*. 5th ed. Edited by P.R. Jeffries, S.M. Swoboda, and B. Akintade. Missouri 63043: Elsevier. Available at: https://book4you.org/book/3560242/72fcf2.

Bisholt, B.K.M. (2012) 'The professional socialization of recently graduated nurses - Experiences of an introduction program', *Nurse Education Today*, 32(3), pp. 278–282. Available at: https://doi.org/10.1016/j.nedt.2011.04.001.

Boese, T., Canto, M., Gonzalez, L., Jones, A., Kennedy, K., Reese, C., Franklin, A.E., Gloe, D., Lioce, L., Meakim, C., Sando, C.R. and Borum, J.C. (2013) 'Standards of Best Practice : Simulation Standard V : Facilitator', *Clinical Simulation in Nursing*, 9(6), pp. S22–S25. Available at: https://doi.org/10.1016/j.ecns.2013.04.010.

Bogossian, F., McKenna, L., Higgin, M., Benefer, C., Brady, S., Fox-Young, S. and Cooper, S. (2012) 'Simulation-based learning in Australian midwifery curricula: Results of a national

electronic survey', *Women and Birth*, 25(2), pp. 86–97. Available at: https://doi.org/10.1016/j.wombi.2011.02.001.

Bogossian, F., Cooper, S., Kelly, M., Levett-Jones, T., McKenna, L., Slark, J. and Seaton, P. (2018) 'Best practice in clinical simulation education − are we there yet ? A cross-sectional survey of simulation in Australian and New Zealand pre-registration nursing education, *Collegian*, 25(3), pp. 327–334. Available at: https://doi.org/10.1016/j.colegn.2017.09.003.

Bogren, M., Aleso, A., Teklemariam, M., Sjoblom, H., Hammarback, L. and Eelandsson, K. (2021) 'Facilitators of and barriers to providing high-quality midwifery education in SouthEast Asia — An integrative review', *Women and Birth* [Preprint], (xxxx). Available at: https://doi.org/10.1016/j.wombi.2021.06.006.

Botma, Y. (2014) 'Nursing student's perceptions on how immersive simulation promotes theory-practice integration', *International Journal of Africa Nursing Sciences*, 1, pp. 1–5.

Available at: https://doi.org/10.1016/j.ijans.2014.04.001.

Bradley, C.S. *et al.* (2019) 'Regulation of Simulation Use in United States Prelicensure Nursing Programs', *Clinical Simulation in Nursing*, 33, pp. 17–25. Available at: https://doi.org/https://doi.org/10.1016/j.ecns.2019.04.004.

Brady, S., Bogossian, F. and Gibbons, K. (2015) 'The effectiveness of varied levels of simulation fidelity on the integrated performance of technical skills in midwifery students - A randomised intervention trial', *Nurse Education Today*, 35(3), pp. 524–529. Available at: https://doi.org/10.1016/j.nedt.2014.11.005.

Brauneis, L. et al. (2021) 'Impact of Low-fidelity Simulation-based Experiences in a Pharmacology Classroom Setting in Prelicensure Graduate Nursing Education', Clinical Simulation in Nursing, 50, pp. 43–47. Available at: https://doi.org/https://doi.org/10.1016/j.ecns.2020.10.002.

Brennan, B.A. (2022) 'The impact of self-efficacy based pre-briefing on nursing student clinical competency and self-efficacy in simulation: An experimental study', *Nurse Education Today*, 109(July 2021), p. 105260. Available at: https://doi.org/10.1016/j.nedt.2021.105260.

Brink, H., van der Walt, C. and van Rensburg, G. (2018) *Fundamentals of Research Methodology for Healthcare Professionals*. 4th Ed. Cape Town, SA: Juta and Company (Pty) Ltd. Available at: https://www.bookdepository.com/Fundamentals-Research-Methodologyfor-Healthcare-Professionals-Hilla-Brink/9780702186899.

Briscoe, J., MacKay, B. and Harding, T. (2017) 'Does Simulation Add Value To Clinical Practice? Undergraduate Student Nurses' Perspective', *Kai Tiaki Nursing Research*, 8(1), pp. 10–15. Available at: https://ezproxy.simmons.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=edsgao&AN=edsgcl.516448823&site=eds-live&scope=site.

Brohard, C. *et al.* (2021) 'From Development to Implementation: The Effectiveness of a High-Fidelity Simulation for Advance Care Planning for Undergraduate Nursing Students, *Journal of Hospice and Palliative Nursing : JHPN : The Official Journal of the Hospice and Palliative Nurses Association*, 23(6), pp. 504–511. Available at: https://doi.org/10.1097/NJH.0000000000000798.

Brown, D.K., Wong, A.H. and Ahmed, R.A. (2018) 'Evaluation of simulation debriefing methods with interprofessional learning', *Journal of Interprofessional Care*, 32(6), pp. 779–781. Available at: https://doi.org/10.1080/13561820.2018.1500451.

Brown, J.F. (2008) 'Applications of simulation technology in psychiatric mental health nursing education', *Journal of Psychiatric and Mental Health Nursing*, 15, pp. 638–644.

Brown, N., Darby, W. and Coronel, H. (2019) 'An Escape Room as a Simulation Teaching Strategy', *Clinical Simulation in Nursing*, 30, pp. 1–6. Available at: https://doi.org/https://doi.org/10.1016/j.ecns.2019.02.002.

Bryant, K., Aebersold, M.L., Jeffries, P.R. and Kardong-Edgren, S. (2020) 'Innovations in Simulation: Nursing Leaders' Exchange of Best Practices, *Clinical Simulation in Nursing*, 41, pp. 33-40.e1. Available at: https://doi.org/10.1016/j.ecns.2019.09.002.

Bryman, A. (2004) ‘Multimethod Research’, in M.S. Lewis-Beck, A. Bryman, and T.F. Liao (eds) *The SAGE Encyclopedia of Social Science Research Methods*. Thousand Oaks: Sage Publications, pp. 678–681. Available at: https://doi.org/10.4135/9781412950589.

Buckley, T. and Gordon, C. (2011) ‘The effectiveness of high fidelity simulation on medical-surgical registered nurses’ ability to recognise and respond to clinical emergencies’, *Nurse Education Today*, 31(7), pp. 716–721. Available at: https://doi.org/10.1016/j.nedt.2010.04.004.

Bvumbwe, T. and Mtshali, N. (2018) ‘Nursing education challenges and solutions in Sub-Saharan Africa: An integrative review’, *BMC Nursing*, 17(1), pp. 1–11. Available at: https://doi.org/10.1186/s12912-018-0272-4.

Cant, R.P. and Cooper, S.J. (2014) ‘Simulation in the Internet age: The place of Web-based simulation in nursing education. An integrative review’, *Nurse Education Today*, 34(12), pp. 1435–1442. Available at: https://doi.org/https://doi.org/10.1016/j.nedt.2014.08.001.

Cant, R.P. and Cooper, S.J. (2017a) ‘The value of simulation-based learning in pre-licensure nurse education: A state-of-the-art review and meta-analysis’, *Nurse Education in Practice*, 27, pp. 45–62. Available at: https://doi.org/10.1016/j.nepr.2017.08.012.

Cant, R.P. and Cooper, S.J. (2017b) ‘Use of simulation-based learning in undergraduate nurse education: An umbrella systematic review’, *Nurse Education Today*, 49, pp. 63–71. Available at: https://doi.org/10.1016/j.nedt.2016.11.015.

Casey, K., Fink, R., Jaynes, C., Campbell, L., Cook, P. and Wilson, V. (2011) ‘Readiness for practice: The senior practicum experience’, *Journal of Nursing Education*, 50(11), pp. 646–652. Available at: https://doi.org/10.3928/01484834-20110817-03.

Chabrera, C., Dobrowolska, B., Jackson, C., Kane, R., Kasimovskaya, N., Kennedy, S., Lovric, R., Treslova, M. and Cabrera, C. (2021) ‘Simulation in Nursing Education Programs: Findings From an International Exploratory Study’, *Clinical Simulation in Nursing*, 59, pp. 23–31. Available at: https://doi.org/https://doi.org/10.1016/j.ecns.2021.05.004.

Chamberlain, J. (2015) ‘Prebriefing in Nursing Simulation: A Concept Analysis Using Rodger’s Methodology’, *Clinical Simulation in Nursing*, 11(7), pp. 318–322. Available at: https://doi.org/10.1016/j.ecns.2015.05.003.

Chernikova, O., Heitzmann, N., Hozberger, D., Seidel, T. and Fischer, F. (2020) ‘Simulation-Based Learning in Higher Education : A Meta-Analysis’, 90(4), pp. 499–541. Available at: https://doi.org/10.3102/0034654320933544.

Chiniara, G., Cole, G., Brisbin, K., Huffman, D., Cragg, B., Lamaccha, M., Norman, D. and Canadian Network for Simulation in Healthcare, Guidelines Working Group. (2013) ‘Simulation in healthcare: A taxonomy and a conceptual framework for instructional design and media selection’, *Medical Teacher*, 35(8), pp. e1380–e1395. Available at: https://doi.org/10.3109/0142159X.2012.733451.

Chircop, A. and Cobbett, S. (2020) ‘Gett’ n on the bus : evaluation of Sentinel City ® 3 . 0 virtual simulations in community/population health clinical placement’, *International Journal of Nursing Education Scholarship*, 17(1–11).

Christiansen, S., Bøje, R.B. and Frederiksen, K. (2015) ‘The use of problem- and simulation-based learning: The student’s perspective’, Nordic Journal of Nursing Research, 35(3), pp. 186–192. Available at: https://doi.org/10.1177/0107408315591777.

Cooper, S., Cant, R., Porter, J., Bogossian, F., McKenna, L., Brady, S. and Fox-Young, S. (2012) ‘Simulation-based learning in midwifery education: A systematic review’, *Women and Birth*, 25(2), pp. 64–78. Available at: https://doi.org/10.1016/j.wombi.2011.03.004.

Craft, C., Feldon, D.F. and Brown, E.A. (2014) ‘Instructional design affects the efficacy of simulation-based training in central venous catheterization’, *American Journal of Surgery*, 207(5), pp. 782–789. Available at: https://doi.org/10.1016/j.amjsurg.2013.06.003.

Creswell, J.W. and Creswell, D.J. (2018) *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. 5th ed. Thousand Oaks: Sage Publications, Inc.

Creswell, J.W. and Poth, C.N. (2018) *Qualitative Inquiry & Research Design: Choosing Among Five Approaches*. 4th ed. Los Angeles: Sage Publications, Inc.

Cunningham, D.D. (2010) ‘Incorporating medium fidelity simulation in a practical nurse education program.’ *Journal of Practical Nursing*, 60(1), pp. 2–5. Available at: https://www.proquest.com/docview/878223590?pq-origsite=gscholar&fromopenview=true.

Curl, E.D., Smith, S., Chisholm, L.A., McGee, L.A. and Das, K. (2016) ‘Effectiveness of Integrated Simulation and Clinical Experiences Compared to Traditional Clinical Experiences for Nursing Students, *Nursing Education Perspectives*, 37(2), pp. 72–77. Available at: https://doi.org/10.5480/15-1647.

Curry-Lourenco, K., Sherraden, B., White, P., Loomis, A., Childress, R.B. and Waxman, K.T. (2022) ‘Where Are We Now? A Follow-up Survey on Regulation of Simulation Use in the United States Prelicensure Nursing Programs’, *Clinical Simulation in Nursing*, 72, pp. 9–14. Available at: https://doi.org/10.1016/j.ecns.2022.06.007.

Dale-Tam, J., Menard, P. and Posner, G. (2021) ‘An Educational Intervention to Improve Simulation Facilitation by Nurse Educators in a Large Canadian Academic Hospital: A Mixed Methods Evaluation’, *Clinical Simulation in Nursing*, 56(C), pp. 29–36. Available at: https://doi.org/10.1016/j.ecns.2021.01.001.

Dale, A.E. (1994) ‘The theory-theory gap: the challenge for nurse teachers’, *Journal of Advanced Nursing*, 20(3), pp. 521–524. Available at: https://doi.org/10.1111/j.13652648.1994.tb02390.x.

Dalley, K., Candela, L. and Benzel-Lindley, J. (2008) ‘Learning to let go: The challenge of de-crowding the curriculum’, *Nurse Education Today*, 28(1), pp. 62–69. Available at: https://doi.org/10.1016/j.nedt.2007.02.006.

Damewood, A.M. (2016) ‘Current Trends in Higher Education Technology: Simulation’, *TechTrends*, 60(3), pp. 268–271. Available at: https://doi.org/10.1007/s11528-016-0048-1.

Darcy-Mahoney, A.E., Hancock, L.E., Iorianni-Cimbak, A., and Curley, M.A.Q. (2013) ‘Using high-fidelity simulation to bridge clinical and classroom learning in undergraduate paediatric nursing’, *Nurse Education Today*, 33(6), pp. 648–654. Available at: https://doi.org/10.1016/j.nedt.2012.01.005.

Davies, H., Schultz, R., Sundin, D. and Jacob, E. (2020) '"Ward for the day": A case study of extended immersive ward-based simulation', *Nurse Education Today*, 90(February), p. 104430. Available at: https://doi.org/10.1016/j.nedt.2020.104430.

Davies, H., Sundin, D., Robinson, S. and Jacob, E.. (2021) 'Does participation in extended immersive ward-based simulation improve the preparedness of undergraduate bachelor's degree nursing students to be ready for clinical practice as a registered nurse? An integrative literature review', *Journal of Clinical Nursing*, 30(19–20), pp. 2897–2911. Available at: https://doi.org/10.1111/jocn.15796.

Davis, A.H., Kimble, L.P. and Gunby, S.S. (2014) 'Nursing faculty use of high-fidelity human patient simulation in undergraduate nursing education: A mixed-methods study', *Journal of Nursing Education*, 53(3), pp. 142–150. Available at: https://doi.org/10.3928/0148483420140219-02.

Davis, D. *et al.* (2018) 'Effect of an Academic–Community Partnership Simulation Education Program on Quality and Safety Education for Nurses Competency Domains for Bachelor of Science in Nursing Students', *Clinical Simulation in Nursing*, 18, pp. 56–63. Available at: https://doi.org/https://doi.org/10.1016/j.ecns.2018.02.003.

Decker, S., Koppelman, D., Gordon, J., Coleman, S.V., Heitzler, E.T and Fall-Dickson, J.M. (2008) 'The Evolution of Simulation and Its Contribution to Competency', *The Journal of Continuing Education in Nursing*, 39(2), pp. 74–80. Available at: https://doi.org/10.3928/00220124-20080201-06.

Decker, S., Fey, M., Siderars, S., Caballero, S., Rockstraw, L.R., Boese, T, Franklin, A.E., Gloe, D., Lioce, L., Sando, C.R., Meakim, Collen, and Borum, J.C. (2013) 'Standards of Best Practice: Simulation Standard VI: The Debriefing Process', *Clinical Simulation in Nursing*, 9(6 SUPPL), pp. S26–S29. Available at: https://doi.org/10.1016/j.ecns.2013.04.008.

Diamond, I.R., Grant, R.C., Feldman, B.M., Pencharz, P.B., Ling, S.C., Moore, A.M. and Wales, P.W. (2014) 'Defining consensus: A systematic review recommends methodologic criteria for reporting of Delphi studies', *Journal of Clinical Epidemiology*, 67(4), pp. 401–409. Available at: https://doi.org/10.1016/j.jclinepi.2013.12.002.

Distelhorst, K.S. and Wyss, L.L. (2013) 'Simulation in community health nursing: A conceptual approach', *Clinical Simulation in Nursing*, 9(10), pp. e445–e451. Available at: https://doi.org/10.1016/j.ecns.2012.07.208.

Dlamini, C.P., Mtshali, N.G., Dlamini C.H., Mahanya, S., Shabangu, T. and Tsabedze, Z. (2014) 'New graduates' readiness for practice in Swaziland: An exploration of stakeholders' perspectives', *Journal of Nursing Education and Practice*, 4(5), pp. 148–158. Available at: https://doi.org/10.5430/jnep.v4n5p148.

Durepos, G. and Wiebe, E. (2010) 'Iterative', in *In : Encyclopedia of Case Study Research*. Thousand Oaks: Sage Research Methods, pp. 504–505. Available at: https://doi.org/10.4135/9781412957397.

Durham, C.F. and Alden, K.R. (2008) 'Enhancing Patient Safety in Nursing Education Through Patient Simulation', in R. Hughes (ed.) *Patient Safety and Quality: An Evidence-based Handbook for Nurses*. Rockville: Agency for Healthcare Research and Quality. Available at: http://www.ncbi.nlm.nih.gov/pubmed/21328731.

Durham, C.F., Cato, M.L. and Lasater, K. (2014) 'NLN/Jeffries Simulation Framework state of the science project: Participant construct', *Clinical Simulation in Nursing*, 10(7), pp. 363–372. Available at: https://doi.org/10.1016/j.ecns.2014.04.002.

Dutton, L.L. and Sellheim, D.O. (2017) 'Academic and Clinical Dissonance in Physical Therapist Education: How Do Students Cope?', *Journal of Physical Therapy Education*, 31(1), pp. 61–72. Available at: https://doi.org/10.1097/00001416-201731010-00009.

Edward, M.I. and Chukwuka, L. (2020) 'Simulation in Nursing Education: Implications for Nurse', *Africa Journal of Health, Nursing and Midwifery*, 3(1), pp. 12–23. Available at: https://www.researchgate.net/publication/342666896.

Elliott, S.E. (2000) *Missionary Nurse Dorothy Davis Cook, 1940-1972 "Mother of Swazi Nurses"*, *Preventing School Failure*. University of San Diego. Available at: https://sigma.nursingrepository.org/bitstream/handle/10755/20002/Elliott_Dissertation.pdf?sequence=1.

Eswatini Medical Christian University (2019) *Welcome to Eswatini Medical Christian University !*, *DotTechnologies*. Available at: http://emcu.ac.sz/vc_page/ (Accessed: 3 February 2021).

Eswatini Ministry of Health (2020) *Regulatory Bodies*, *Swaziland Nursing Council*. Available at: http://www.gov.sz/index.php/ministries-departments/ministry-of-health/regulatorybodies/73-health/health/748-swaziland-nursing-council (Accessed: 16 June 2020).

Eyikara, E. and Baykara, G.Z. (2017) 'The importance of simulation in nursing education', World Journal on Educational Technology: Current Issues, 9(1), pp. 02–07. Available at: https://un-pub.eu/ojs/index.php/wjet/article/view/543.

Falcone, R.A., Daugherty, M, Schweer, L., Patterson, M., Brown, R. and Garcia, V.F. (2008) 'Multidisciplinary pediatric trauma team training using high-fidelity trauma simulation', *Journal of Pediatric Surgery*, 46, pp. 1065–1071. Available at: https://doi.org/10.1016/j.jpedsurg.2008.02.033.

Fanning, R.M. and Gaba, D.M. (2007) 'The role of debriefing in simulation-based learning', *Simulation in Healthcare*, 2(2), pp. 115–125. Available at: https://doi.org/10.1097/SIH.0b013e3180315539.

Faulcon, R.Y. (2015) 'Innovative Teaching Strategies with Simulation Technology in Nursing Education, *Voices in Education*, 1, pp. 47–50. Available at: https://www.college.bm/images/documents/bcj/Vol_1/Innovative_Strategies_with_Simulation_Technology_in_Nursing_Education.pdf.

Felton, A. and Wright, N. (2017) 'Simulation in mental health nurse education: The development, implementation and evaluation of an educational innovation', *Nurse Education in Practice*, 26, pp. 46–52. Available at: https://doi.org/10.1016/j.nepr.2017.06.005.

Fenwick, T. and Dahlgren, M.A. (2015) 'Towards socio-material approaches in simulation-based education: Lessons from complexity theory', *Medical Education*, 49(4), pp. 359–367.

Available at: https://doi.org/10.1111/medu.12638.

Ferguson, J., Astbury, J., Willis, S., Silverthorne, J. and Schafheutle, E. (2020) 'Implementing, embedding and sustaining simulation-based education : What helps, what hinders', (September 2019), pp. 915–924. Available at: https://doi.org/10.1111/medu.14182.

Fey, M.K., Scandis, D., Daniels, A. and Haut, C. (2014) 'Learning Through Debriefing: Students' Perspectives, *Clinical Simulation in Nursing*, 10(5), pp. e249–e256. Available at: https://doi.org/https://doi.org/10.1016/j.ecns.2013.12.009.

Fieux, M., Zaouche, S., Philouze, P., Truy, E., Hermann, R. and Tringali, S. (2021) 'Lowfidelity otoscopy simulation and anatomy training: A randomized controlled trial', *European Annals of Otorhinolaryngology, Head and Neck Diseases*, 138(4), pp. 231–234. Available at: https://doi.org/10.1016/j.anorl.2020.09.010.

Foisy-Doll, C. and Leighton, K. (2017a) *2017 SCORS Guidebook: A Companion for Completing the Simulation Culture Organizational Readiness Survey*. Available at: https://sites.google.com/site/ scorsfile/ For (Accessed: 11 October 2020).

Foisy-Doll, C. and Leighton, K. (2017b) *Organizational SCOR to Mitigate Risk : The Simulation Culture Organizational*. Available at: https://www.simone.ca/sites/default/files/2017NationalForum_Workshop_SCOR.pdf.

Foisy-Doll, C. and Leighton, K. (2017c) 'SCORS: Simulation culture organizational readiness survey. An adaptation with permission of the Organizational Culture & Readiness for Systemy Wide Integration of Evidence-based Practice Survey. Fineout-Overholt, E., & Melnyk, B. M. In B. M. Melnyk, &'. Available at: https://sites.google.com/site/scorsfile/ (Accessed: 11 October 2020).

Forrest, K., McKimm, J. and Edgar, S. (2013) *Essential Simulation in Clinical Education*. West Sussex: Wiley-Blackwell. Available at: https://book4you.org/book/2271168/089732.

Forrest, Kristy and McKimm, J. (2019) *Healthcare Simulation at a Glance*. Edited by Kirsty Forrest and J. McKimm. Chichester (UK): Wiley-Blackwell.

Franklin, A.E., Boese, T., Gloe, D., Lioce, L., Decker, S., Sando, C.R, Meakim, C. and Borum, J.C. (2013) 'Standards of Best Practice : Simulation Standard IV : Facilitation',

Clinical Simulation in Nursing, 9(6), pp. S19–S21. Available at: https://doi.org/10.1016/j.ecns.2013.04.011.

Franklin, A.E., Leighton, K., Cantrell, M.A. and Rutherfolrd-Hemming, T. (2015) 'Simulation research for academics: Novice level this invited article is a product of the INACSL standards committee', *Clinical Simulation in Nursing*, 11(4), pp. 214–221. Available at: https://doi.org/10.1016/j.ecns.2015.01.007.

Franklin, A.E., Sideras, S., Dodd, C. and Huston, J. (2020) 'A Randomized Trial of Multiple-Patient Simulation Preparation to Improve Novice Nurses' Competence and Self-Efficacy', *Nursing Education Perspectives*, 41(3), pp. 146–151. Available at: https://doi.org/10.1097/01.NEP.0000000000000593.

Fritz, J., Mantoya, A., Lamadrid-Figueroa, H., Flores-Pimental, D., Trevino-Siller, S., Gonzalez-Hernandez, D. and Magana-Valladares, L. (2020) 'Training in obstetric and neonatal emergencies in Mexico: Effect on knowledge and self-efficacy by gender, age, shift, and profession', *BMC Medical Education*, 20(1), pp. 1–10. Available at: https://doi.org/10.1186/s12909-020-02005-8.

Gaba, D. M. (2004) 'The future vision of simulation in health care', *Quality Safe Health Care*, 13 (Suppl)(1), pp. i2–i10. Available at: https://doi.org/10.1136/qshc.2004.009878.

Gaberson, K.B., Oermann, M., Shellenbarger, T. (2015) *Clinical Teaching Strategies in Nursing*. 4th ed. New York: Springer Publishing Company, LLC. Available at: https://doi.org/10.3928/00220124-20080701-11.

Gaudet, S. and Robert, D. (2018) 'Designing an Iterative Research Project', in J. Seaman (ed.) *A Journey Through Qualitative Research: From Design to Reporting*. 55 City Road: SAGE Publications Ltd, pp. 20–39. Available at: https://doi.org/10.4135/9781529716733.

Glaser, B.G. (1965) 'The Constant Comparative Method of Qualitative Analysis', *Social Problems*, 12(4), pp. 436–445. Available at: file:///C:/Users/USER/Downloads/Glaser65ConstantComparativeAnalysis.pdf.

Glen, S. (2009) 'Nursing education--is it time to go back to the future?', *British Journal of Nursing (Mark Allen Publishing)*, 18(8), pp. 498–502. Available at: https://doi.org/10.12968/bjon.2009.18.8.41814.

Gordon, R.M. (2017) 'Debriefing Virtual Simulation Using an Online Conferencing Platform: Lessons Learned', *Clinical Simulation in Nursing*, 13(12), pp. 668–674. Available at: https://doi.org/https://doi.org/10.1016/j.ecns.2017.08.003.

Gore, T., Lutz, R., Bernard, R.O., and Hernandez, I.F. (2018) 'Home health simulation: Helping students meet the changing healthcare needs', *Journal of Nursing Education and Practice*, 9(1), p. 27. Available at: https://doi.org/10.5430/jnep.v9n1p27.

Gore, T. and Thomson, W. (2016) 'Use of simulation in undergraduate and graduate education', *AACN Advanced Critical Care*, 27(1), pp. 86–95. Available at: https://doi.org/10.4037/aacnacc2016329.

Graham, C.L., Atz, T., Phillips, S., Newman, S. and Foronda*, C.* (2018) 'Exploration of a Racially Diverse Sample of Nursing Students' Satisfaction, Self-Efficacy, and Perceptions of Simulation Using Racially Diverse Manikins: A Mixed Methods Pilot Study', *Clinical Simulation in Nursing*, 15, pp. 19–26. Available at: https://doi.org/10.1016/j.ecns.2017.08.007.

Grant, V.J., Wolff, M. and Adler, M. (2016) 'Simulation-based Education for Paediatric Emergency Medicine', *Clinical Paediatric Emergency Medicine*, 17(3), pp. 159–168. Available at: https://doi.org/10.1016/j.cpem.2016.05.005.

Gray, J.R., Grove, S.K. and Sutherland, S. (2017) *Burns and Grove's The Practice of Nursing Research: Appraisal, Synthesis, and Generation of Evidence*. 8th ed. Missouri: Elsevier.

Green, R.A. (2014) 'The Delphi Technique in Educational', *SAGE Journals*, 4(2), pp. 1–8. Available at: https://doi.org/10.1177/2158244014529773.

Groom, J.A., Henderson, D. and Sittner, B.J. (2014) 'NLN/Jeffries Simulation Framework state of the science project: Simulation design characteristics', *Clinical Simulation in Nursing*, 10(7), pp. 337–344. Available at: https://doi.org/10.1016/j.ecns.2013.02.004.

Grota, P.G., O'Neal, C., Shelton, A. and McNutt, V.H. (2020) 'Using International Nursing Association for Clinical Simulation and Learning Standards to Evaluate the Rigor of High-Fidelity Simulation Learning Experiences', *Clinical Simulation in Nursing*, 46, pp. 50–56. Available at: https://doi.org/https://doi.org/10.1016/j.ecns.2020.05.001.

Guimond, M.E., Foreman, S.E. and Werb, M. (2019) 'Evaluation of an unfolding obstetric experience simulation in an undergraduate nursing program', *Nurse Education Today*, 79, pp. 124–128. Available at: https://doi.org/https://doi.org/10.1016/j.nedt.2019.05.003.

Guise, V., Chambers, M. and Välimäki, M. (2012) 'What can virtual patient simulation offer mental health nursing education?', *Journal of Psychiatric and Mental Health Nursing*, 19(5), pp. 410–418. Available at: https://doi.org/10.1111/j.1365-2850.2011.01797.x.

Gunowa, N.O., Elliott, K. and McBride, M. (2018) 'Nursing simulation: A community experience', *British Journal of Community Nursing*, 23(4), pp. 174–178. Available at: https://doi.org/10.12968/bjcn.2018.23.4.174.

Hall, K. and Tori, K. (2017) 'Best Practice Recommendations for Debriefing in Simulation-Based Education for Australian Undergraduate Nursing Students: An Integrative Review', *Clinical Simulation in Nursing*, 13(1), pp. 39–50. Available at: https://doi.org/10.1016/j.ecns.2016.10.006.

Hall, K., Vet, D. and Tae, C.I. V (2017) 'Simulation-Based Learning in Australian Undergraduate Mental Health Nursing Curricula: A Literature Review', *Clinical Simulation in Nursing*, 13(8), pp. 380–389. Available at: https://doi.org/10.1016/j.ecns.2017.04.002.

Harder, N., Ross, C.J.M. and Paul, P. (2013) 'Student perspective of roles assignment in high-fidelity simulation: An ethnographic study', *Clinical Simulation in Nursing*, 9(9), pp. e329–e334. Available at: https://doi.org/10.1016/j.ecns.2012.09.003.

Hayden, J., Keegan, M., Kardong-Edgren, S. and Smiley, R.A. (2014) 'Reliability and validity testing of the Creighton competency evaluation instrument for use in the ncsbn national simulation study', *Nursing Education Perspectives*, 35(4), pp. 244–252. Available at: https://doi.org/10.5480/13-1130.1.

Hayden, J.K., Smiley, R.A., Alexander, M. and Kardong-edgren, S. (2014) 'The NCSBN National Simulation Study: A Longitudinal, Randomized, Controlled Study Replacing Clinical Hours with Simulation in Prelicensure Nursing Education', *Journal of Nursing Regulation*, 5(2). Available at: https://www.ncsbn.org/JNR_Simulation_Supplement.pdf (Accessed: 18 June 2020).

Helgesen, A.K., Gregersen, A.G. and Roos, A.K.O. (2016) 'Nurse students' experiences with clinical placement in outpatient unit - a qualitative study', *BMC Nursing*, 15(1), pp. 1–6. Available at: https://doi.org/10.1186/s12912-016-0167-1.

Herlihy, K. (2022) 'Faculty perceptions of preparation for teaching pre-licensure simulation: A qualitative descriptive study', *Teaching and Learning in Nursing*, 17(2), pp. 180–184. Available at: https://doi.org/10.1016/j.teln.2021.12.001.

Herlihy, K. and Teel, C. (2020) 'Faculty perceptions of nursing student preparation in undergraduate clinical simulation', *Teaching and Learning in Nursing*, 15(3), pp. 181–185. Available at: https://doi.org/10.1016/j.teln.2020.03.001.

Hernandez-Acevedo, B. (2021) 'Nursing faculty integrate simulation instruction into their teaching practice: A phenomenological study', *Teaching and Learning in Nursing*, 16(3), pp. 205–209. Available at: https://doi.org/10.1016/j.teln.2021.03.003.

Hesse-Biber, S. and Johnson, B.R. (2015) *The Oxford Handbook of Multimethod and Mixed Methods Research Inquiry*. Edited by S. Hesse-Biber and B.R. Johnson. New York: Oxford University Press.

Hopwood, N., Rooney, D., Boud, D. and Kelly, M. (2016) 'Simulation in Higher Education: A socio-material view', *Educational Philosophy and Theory*, 48(2), pp. 165–178. Available at: https://doi.org/10.1080/00131857.2014.971403.

Hosny, S.G, Johnston, M.J., Pucher, P.H., Erridge, S. and Darzi, A. (2017) 'Barriers to the implementation and uptake of simulation-based training programs in general surgery : a multinational qualitative study', *Journal of Surgical Research*, 220(0), pp. 419-426.e2. Available at: https://doi.org/10.1016/j.jss.2017.07.020.

House, S., Dowell, S., Fox, M., Vickers, C. and Hamilton, M. (2016) 'Low-Fidelity Simulation to Enforce Patient Safety', *Clinical Simulation in Nursing*, 12(1), pp. 24–29. Available at: https://doi.org/10.1016/j.ecns.2015.11.002.

Howard, V.M., Englert, N., Kameg, K. and Perozzi, K. (2011) 'Integration of Simulation Across the Undergraduate Curriculum : Student and Faculty Perspectives', *Clinical Simulation in Nursing*, 7(1), pp. e1–e10. Available at: https://doi.org/10.1016/j.ecns.2009.10.004.

Hsieh, H.F. and Shannon, S.E. (2005) 'Three approaches to qualitative content analysis', *Qualitative Health Research*, 15(9), pp. 1277–1288. Available at: https://doi.org/10.1177/1049732305276687.

Humphreys, M. (2013) 'Developing an educational framework for the teaching of simulation within nurse education', *Open Journal of Nursing*, 03(04), pp. 363–371. Available at: https://doi.org/10.4236/ojn.2013.34049.

Husson, N.M., Zulkosky, K., Fetter, M. and Kamerer, J. (2014) 'Integrating community health simulation scenarios: Experiences from the NCSBN national simulation study', *Clinical Simulation in Nursing*, 10(11), pp. 581–586. Available at: https://doi.org/10.1016/j.ecns.2013.11.009.

ICAP (2016) 'The PEPFAR Nursing Education Partnership Initiative (NEPI) 2012-2016', pp. 2012–2016.

INACSL Standards Committee (2016a) 'INACSL Standards of Best Practice: SimulationSM Outcomes and Objectives', *Clinical Simulation in Nursing*, 12, pp. S13–S15. Available at: https://doi.org/10.1016/j.ecns.2016.09.006.

INACSL Standards Committee (2016b) 'INACSL Standards of Best Practice: SimulationSM Participant Evaluation', *Clinical Simulation in Nursing*, 12, pp. S26–S29. Available at: https://doi.org/10.1016/j.ecns.2016.09.009.

INACSL Standards Committee (2016c) *INACSL standards of best practice: SimulationSM Simulation design*, *Clinical Simulation in Nursing*. Available at: https://doi.org/10.1016/j.ecns.2016.09.005.

INACSL Standards Committee (2016d) 'INACSL Standards of Best Practice: SimulationSM Simulation Design', *Clinical Simulation in Nursing*, 12(S), pp. S5–S12. Available at: https://doi.org/10.1016/j.ecns.2016.09.005.

INACSL Standards Committee (2016e) 'INACSL Standards of Best Practice: SimulationSM Simulation Glossary', *Clinical Simulation in Nursing*, 12(S), pp. S5–S12. Available at: https://doi.org/10.1016/j.ecns.2016.09.012.

INACSL Standards Committee, McMahon, E., *et al.* (2021) 'Healthcare Simulation Standards of Best PracticeTM Evaluation of Learning and Performance', *Clinical Simulation in Nursing*, 58, pp. 54–56. Available at: https://doi.org/10.1016/j.ecns.2021.08.016.

INACSL Standards Committee, McDermott, D.S., *et al.* (2021) 'Healthcare Simulation Standards of Best PracticeTM Prebriefing: Preparation and Briefing', *Clinical Simulation in Nursing*, 58, pp. 9–13. Available at: https://doi.org/10.1016/j.ecns.2021.08.008.

INACSL Standards Committee, Molloy, M.A., *et al.* (2021) 'Healthcare Simulation Standards of Best PracticeTM Simulation Glossary', *Clinical Simulation in Nursing*, 58, pp. 57–65. Available at: https://doi.org/10.1016/j.ecns.2021.08.017.

Institute of Medicine (2011) *The future of nursing: Leading change, advancing health*, *The Future of Nursing: Leading Change, Advancing Health*. Washington, DC: The National Academies Press. Available at: https://doi.org/10.17226/12956.

Israel, G.D. (1992) 'Determining Sample Size', *Agricultural Education and Communication Department, Florida Cooperative Extension Service*. Florida: EDIS, pp. 1–5. Available at:

https://www.tarleton.edu/academicassessment/wpcontent/uploads/sites/119/2022/05/Samplesize.pdf.

Issenberg, S.B. (2006) 'The scope of simulation-based healthcare education.' *Simulation in healthcare : journal of the Society for Simulation in Healthcare*, 1(4), pp. 203–208. Available at: https://doi.org/10.1097/01.SIH.0000246607.36504.5a.

Jansen, D.A. *et al.* (2009) 'Nursing Faculty Perceptions of Obstacles to Utilizing Manikinbased Simulations and Proposed Solutions', *Clinical Simulation in Nursing*, 5(1), pp. e9– e16. Available at: https://doi.org/10.1016/j.ecns.2008.09.004.

Jason, L.A. and Glenwick, D.S. (2016) *Handbook of Methodological Approaches to Community-Based Research: Qualitative, Quantitative, and Mixed Methods*. Auckland: Oxford University Press.

Jeffries, P.R. (2005a) 'A framework for designing, implementing, and evaluating: simulations used as teaching strategies in nursing', *Nursing Education Perspectives*, 26(2), pp. 96–103. Available at: https://content.ebscohost.com/ContentServer.asp?EbscoContent=dGJyMNLr40Sep7E4zdnyOLCmsEiep7VSrqe4TbOWxWXS&ContentCustomer=dGJyMPGrsUyvr7ZNuePfgeyx9Yvf5ucA&T=P&P=AN&S=R&D=ccm&K=106478019 (Accessed: 13 October 2020).

Jeffries, P.R. (2005b) 'Technology trends in nursing education: Next steps', *Journal of Nursing Education*, 44(1), pp. 3–4. Available at: https://doi.org/10.3928/0148483420050101-01.

Jeffries, P.R., Dreifuerst, K.T., Kardong-edgren, S. and Hayden, J. (2015) 'Faculty Development when Initiating Simulation Programs : Lessons Learned From the National Simulation Study, *Journal of Nursing Regulation*, 5(4), pp. 17–23. Available at: https://doi.org/10.1016/S2155-8256(15)30037-5.

Jeffries, P.R. (2021) *The NLN Jeffries Simulation Theory*. 15th Editi. USA: Wolters Kluwer Health. Available at: vbk://9781975185060.

Jeffries, P.R., Rodgers, B. and Adamson, K. (2015) 'NLN Jeffries simulation theory: brief narrative description', *Nursing Education Perspectives*, 36(5), pp. 292–293. Available at: https://doi.org/10.1097/00024776-201509000-00004.

Jones, Amy L., Reese, C.E. and Shelton, D.P. (2014) 'NLN/Jeffries Simulation Framework state of the science project: The teacher construct', *Clinical Simulation in Nursing*, 10(7), pp. 353–362. Available at: https://doi.org/10.1016/j.ecns.2013.10.008.

Jones, Amy L, Reese, C.E. and Shelton, D.P. (2014) 'NLN/Jeffries Simulation Framework State of the Science Project: The Teacher Construct', *Clinical Simulation in Nursing*, 10(7), pp. 353–362. Available at: https://doi.org/https://doi.org/10.1016/j.ecns.2013.10.008.

Junyan, Q. (2019) 'Application Research of Medical Simulation Teaching in Nursing Education', in *8th International Conference on Education and Management (ICEM 2018)*. Atlatis Press, pp. 209–211. Available at: http://creativecommons.org/licenses/by-nc/4.0/.

Kardong-Edgren, S., Willhaus, J., Bennett, D. and Hayden, J. (2012) 'Results of the National Council of State Boards of Nursing National Simulation Survey: Part II', *Clinical Simulation in Nursing*, 8(4), pp. e117–e123. Available at: https://doi.org/https://doi.org/10.1016/j.ecns.2012.01.003.

Kardong-Edgren, S. and Adamson, K.A. (2009) 'BSN Medical-Surgical Student Ability to Perform CPR in a Simulation: Recommendations and Implications', *Clinical Simulation in Nursing*, 5(2). Available at: https://doi.org/10.1016/j.ecns.2009.01.006.

Kardong-Edgren, S., Adamson, K.A. and Fitzgerald, C. (2010a) 'A Review of Currently Published Evaluation Instruments for Human Patient Simulation', *Clinical Simulation in Nursing*, 6(1), pp. e25–e35. Available at: https://doi.org/10.1016/j.ecns.2009.08.004.

Kardong-Edgren, S., Adamson, K.A. and Fitzgerald, C. (2010b) 'A Review of Currently Published Evaluation Instruments for Human Patient Simulation', *Clinical Simulation in Nursing*, 6(1), pp. e25–e35. Available at: https://doi.org/https://doi.org/10.1016/j.ecns.2009.08.004.

Kardong-Edgren, S.E., Starkweather, A.R. and Ward, L.D. (2008) 'The integration of simulation into clinical foundations of nursing course: Student and faculty perspectives', *International Journal of Nursing Education Scholarship*, 5(1). Available at: https://doi.org/10.2202/1548-923X.1603.

Keeney, S., Hasson, F. and Mckenna, H. (2011) *The Delphi Technique in Nursing and Health Research*. Chichester: John Wiley-Blackwell. Available at: https://book4you.org/book/1216703/5fa03e.

Kelemen, M.L. and Rumens, N. (2008) 'Organisational Paradigms and Management Research, in *In: An Introduction to Critical Management Research*. Liverpool: SAGE Publication, Inc. Available at: https://doi.org/10.4135/9780857024336.

Khalil, H., Bennett, M., Godfrey, C., McInerney, P., Munn, Z. and Peters, M. (2019) 'Evaluation of the JBI scoping reviews methodology by current users', *International Journal of Evidence-Based Healthcare*, pp. 95–100. Available at: https://doi.org/10.1097/XEB.0000000000000202.

Khalil, H. Peters, M.D.J., Tricco, A.C., Pollock, D., Alexander, L., McInerney, P., Godfrey, C.M. and Munn, Z. (2021) 'Conducting high quality scoping reviews-challenges and solutions', *Journal of Clinical Epidemiology*, 130, pp. 156–160. Available at: https://doi.org/10.1016/j.jclinepi.2020.10.009.

Khamis, N.N., Satava, R.M., Alnassar, S.A. and Kern, D.E. (2016) 'A stepwise model for simulation-based curriculum development for clinical skills, a modification of the six-step approach', *Surgical Endoscopy*, 30(1), pp. 279–287. Available at: https://doi.org/10.1007/s00464-015-4206-x.

Al Khasawneh, E., Arulappan, J., Natarajan, J.R., Raman, S. and Isac, C. (2021) 'Efficacy of Simulation Using NLN/Jeffries Nursing Education Simulation Framework on Satisfaction and Self-Confidence of Undergraduate Nursing Students in a Middle-Eastern Country', *SAGE Open Nursing*, 7(1), pp. 1–10. Available at: https://doi.org/10.1177/23779608211011316.

Kiernan, L.C. and Olsen, D.M. (2020) ‘Improving clinical competency using simulation technology’, *Nursing*, 50(7), pp. 14–19. Available at: https://doi.org/10.1097/01.nurse.0000668448.43535.4f.

Kim, J., Park, J. and Shin, S. (2016) ‘Effectiveness of simulation-based nursing education depending on fidelity : a meta-analysis’, *BMC Medical Education*, 16(152), pp. 1–8. Available at: https://doi.org/10.1186/s12909-016-0672-7.

Klipfel, J.M., Carolan, B.J., Brytowski, N., Mitchell, C.A., Gettman, M.T. and Jacobson, T.M. (2014) ‘Patient safety improvement through in situ simulation interdisciplinary team training.’ *Urologic nursing*, 34(1), pp. 39–46. Available at: https://doi.org/10.7257/1053816X.2014.34.1.39.

Kolb, D. (2015) *Experiential learning: experience as the source of learning and development*. 2 Ed. New Jersey: Pearson Education, Inc. Available at: https://book4you.org/book/5960140/fa9f0b.

Kostovich, C.T., O’Rourke, J. and Stephen, L.A. (2020) ‘Establishing psychological safety in simulation: Faculty perceptions’, *Nurse Education Today*, 91(March), p. 104468. Available at: https://doi.org/10.1016/j.nedt.2020.104468.

Kunst, E.L., Mitchell, M. and Johnston, A.N.B. (2017) ‘Using simulation to improve the capability of undergraduate nursing students in mental health care’, *Nurse Education Today*, 50, pp. 29–35. Available at: https://doi.org/10.1016/j.nedt.2016.12.012.

Lafond, C.M. and Van Hulle Vincent, C. (2013) ‘A critique of the National League for Nursing/Jeffries simulation framework’, *Journal of Advanced Nursing*, 69(2), pp. 465–480. Available at: https://doi.org/10.1111/j.1365-2648.2012.06048.x.

Landers, M.G., O’Mahony, M. and McCarthy, B. (2020) ‘A Theoretical Framework to Underpin Clinical Learning for Undergraduate Nursing Students’, *Nursing Science Quarterly*, 33(2), pp. 159–164. Available at: https://doi.org/10.1177/0894318419898167.

Lapkin, S. and Levett-Jones, T. (2011) ‘A cost-utility analysis of medium vs. high-fidelity human patient simulation manikins in nursing education’, *Journal of Clinical Nursing*, 20(23–24), pp. 3543–3552. Available at: https://doi.org/10.1111/j.1365-2702.2011.03843.x.

Larue, C., Pepin, J. and Allard, É. (2015) ‘Simulation in preparation or substitution for clinical placement : A systematic review of the literature’, *Journal of Nursing Education and Practice*, 5(9), pp. 132–140. Available at: https://doi.org/10.5430/jnep.v5n9p132.

Lavoie, B.P. and Sean, P. (2017) ‘Simulation in nursing education’. Available at: https://doi.org/10.1097/01.NUMA.0000511924.21011.1b.

Lavoie, P. *et al.* (2018) ‘Learning theories and tools for the assessment of core nursing competencies in simulation: A theoretical review’, *Journal of Advanced Nursing*, 74(2), pp. 239–250. Available at: https://doi.org/10.1111/jan.13416.

Lavoie, P. and Clarke, S.P. (2018) ‘Simulation in Nursing Education’, *American Journal of Nursing*, 118(7), pp. 18–20. Available at: https://doi.org/10.1097/01.NAJ.0000541416.90476.1a.

Lee, K.H.K., Grantham, H. and Boyd, R. (2008) ‘Comparison of high- and low-fidelity mannequins for clinical performance assessment’, *EMA - Emergency Medicine Australasia*, 20(6), pp. 508–514. Available at: https://doi.org/10.1111/j.1742-6723.2008.01137.x.

Lefroy, J. and Yardley, S. (2015) ‘Embracing complexity theory can clarify best practice frameworks for simulation education’, *Medical Education*, 49(4), pp. 344–346. Available at: https://doi.org/10.1111/medu.12662.

Leigh, G. and Steuben, F. (2018) ‘Setting Learners up for Success: Presimulation and Prebriefing Strategies’, *Teaching and Learning in Nursing*, 13(3), pp. 185–189. Available at: https://doi.org/10.1016/j.teln.2018.03.004.

Leighton, K., Foisy-Doll, C., Mudra, V. and Ravert, P. (2020) ‘Guidance for Comprehensive Health Care Simulation Program Evaluation’, *Clinical Simulation in Nursing*, 48, pp. 20–28. Available at: https://doi.org/https://doi.org/10.1016/j.ecns.2020.08.003.

Leighton, K., Foisy-Doll, C. and Gilbert, G.E. (2018) 'Development and Psychometric Evaluation of the Simulation Culture Organizational Readiness Survey', *Nurse Educator*, 43(5), pp. 251–255. Available at: https://doi.org/10.1097/NNE.0000000000000504.

Leighton, K., McNelis, A. and Kardong-Edgren, S. (2022) 'The competency of clinical nurse educators', *Journal of Professional Nursing*, 43(January), pp. 1–4. Available at: https://doi.org/10.1016/j.profnurs.2022.08.004.

Leighton, K., Mudra, V. and Gilbert, G.E. (2018) 'Development and Psychometric Evaluation of the Facilitator Competency Rubric', *Nursing Education Perspectives*, 39(6), pp. E3–E9. Available at: https://doi.org/10.1097/01.NEP.0000000000000409.

Levac, D., Colquhoun, H. and O'Brien, K.K. (2010) 'Scoping studies: Advancing the methodology', *Implementation Science*, 5(1), pp. 1–9. Available at: https://doi.org/10.1186/1748-5908-5-69.

Levett-Jones, T., Lapkin, S., Hoffman, K., Arthur, C. and Roche, J. (2011) 'Examining the impact of high and medium fidelity simulation experiences on nursing students' knowledge acquisition', *Nurse Education in Practice*, 11(6), pp. 380–383. Available at: https://doi.org/10.1016/j.nepr.2011.03.014.

Lewis, K.A., Ricks, T.N., Rowin, A., Ndlovu, C., Goldstein, L. and McElvogue, C. (2019) 'Does Simulation Training for Acute Care Nurses Improve Patient Safety Outcomes: A Systematic Review to Inform Evidence-Based Practice', *Worldviews on Evidence-Based Nursing*, 16(5), pp. 389–396. Available at: https://doi.org/10.1111/wvn.12396.

Li, T., Petrini, M.A. and Stone, T.E. (2018) 'Nurse Education Today Baccalaureate nursing students ' perspectives of peer tutoring in simulation laboratory, a Q methodology study', *Nurse Education Today*, 61(December 2017), pp. 235–241. Available at: https://doi.org/10.1016/j.nedt.2017.12.001.

Liaw, S.Y. *et al.* (2014) 'Easing student transition to graduate nurse: A simulated professional learning environment (SIMPLE) for final year student nurses', *Nurse Education Today*, 34(3), pp. 349–355. Available at: https://doi.org/10.1016/j.nedt.2013.04.026.

Lin, Y., Cheng, A., Hecker, K., Grant, V. and Currie, G.R. (2018) 'Implementing economic evaluation in simulation-based medical education: challenges and opportunities', *Medical Education*, 52(2), pp. 150–160. Available at: https://doi.org/10.1111/medu.13411.

Lincoln, Y. and Guba, E. (1985) *Naturalistic Inquiry*. 1st ed. Newbury Park: Sage Publications.

Linstone, H.A. and Turoff, M. (2002) *The Delphi Method: Techniques and Applications*. California. Available at: https://web.njit.edu/~turoff/pubs/delphibook/delphibook.pdf.

Lioce, L. Reed, C.C., Lemon, D., King, M.A., Martinez, P.A., Franklin, A.E., ….Borum, J.C (2013) 'Standards of Best Practice : Simulation Standard III : Participant Objectives', *Clinical Simulation in Nursing*, 9(6), pp. S15–S18. Available at: https://doi.org/10.1016/j.ecns.2013.04.005.

Lioce, L., Meakim, C.H., Fey, M.K., Chmil, J.V., Mariani, B. and Alinier, G. (2015) 'Standards of Best Practice: Simulation Standard IX: Simulation Design', *Clinical Simulation in Nursing*, 11(6), pp. 309–315. Available at: https://doi.org/10.1016/j.ecns.2015.03.005.

Livesay, K. and Lawrence, K. (2018) 'Staff perception of the sustainability of a mature simulation program in nursing and midwifery education: A phenomenological analysis', *Nurse Education Today*, 71(September), pp. 145–150. Available at: https://doi.org/10.1016/j.nedt.2018.09.020.

Lubbers, J. and Rossman, C. (2017) 'Satisfaction and self-confidence with nursing clinical simulation: Novice learners, medium-fidelity, and community settings', *Nurse Education Today*, 48, pp. 140–144. Available at: https://doi.org/10.1016/j.nedt.2016.10.010.

Ludlow, J. (2021) 'Prebriefing: A Principle-Based Concept Analysis', *Clinical Simulation in Nursing*, 56, pp. 22-28.e1. Available at: https://doi.org/10.1016/j.ecns.2020.11.003.

Makhmutov, R. (2021) 'The Delphi method at a glance', *Pflege*, 34(2), p. 221. Available at: https://doi.org/10.1024/1012-5302/a000812.

Martins, J.C.A., Baptista, R.C.N., Coutinho, V.R.D., Fernandes, M.I.D. and Maria, F.A.

(2018) *Simulation in nursing and midwifery education*, *World Health Organisation*. Marmorvej, Denmark: WHO-Europe. Available at: https://www.euro.who.int/__data/assets/pdf_file/0011/383807/snme-report-eng.pdf (Accessed: 10 November 2019).

Maskálová, E., Urbanová, E., Ba, M. and Kvaltínyová, E. (2018) 'Experience of lecturers with simulation training in midwifery education in Slovakia', *Midwifery*, 59(December 2017), pp. 1–3. Available at: https://doi.org/10.1016/j.midw.2018.01.001.

Maxwell, J.A. (2013) *Qualitative Research Design: An Interactive Approach*. Edited by 3rd Ed. Thousand Oaks: Sage Publications, Inc.

McDermott, D.S. (2016) 'The Prebriefing Concept: A Delphi Study of CHSE Experts', *Clinical Simulation in Nursing*, 12(6), pp. 219–227. Available at: https://doi.org/10.1016/j.ecns.2016.02.001.

McDermott, D.S. (2020) 'Prebriefing : A Historical Perspective and Evolution of a Model and Strategy (Know : Do : Teach)', *Clinical Simulation in Nursing*, 49(C), pp. 40–49. Available at: https://doi.org/10.1016/j.ecns.2020.05.005.

McDermott, D.S., Sarasnick, J. and Timcheck, P. (2017) 'Using the INACSL Simulation™ Design Standard for Novice Learners', *Clinical Simulation in Nursing*, 13(6), pp. 249–253. Available at: https://doi.org/https://doi.org/10.1016/j.ecns.2017.03.003.

McFaden, C. (2020) 'Simulation realism, contextual fidelity, and unintended lessons', *Nurse Education Today*, 85(July 2019), pp. 2019–2021. Available at: https://doi.org/10.1016/j.nedt.2019.104307.

McLaughlin, M.P., Starobin, S.S. and Laanan, F.S. (2010) 'Medical simulation in the community college health science curriculum: A matrix for future implementation', *Community College Journal of Research and Practice*, 34(6), pp. 462–476. Available at: https://doi.org/10.1080/10668920903235811.

Mclellan, A., Aden, A., Lacroix, A. and Shephard, J. (2020) 'Analysis of Bachelor of Science in Nursing Education in Sierra Leone: A look at program fidelity and student satisfaction',

International Journal of Africa Nursing Sciences, 12(October 2019), p. 100180. Available at: https://doi.org/10.1016/j.ijans.2019.100180.

Meakim, C., Boese, T., Decker, S., Franklin, A.E., Gloe, D., …… Borum, J.C. (2013) 'Standards of Best Practice: Simulation Standard I: Terminology', *Clinical Simulation in Nursing*, 9(6 SUPPL), pp. S3–S11. Available at: https://doi.org/10.1016/j.ecns.2013.04.001.

Miles, D.A. (2018) 'Simulation learning and transfer in undergraduate nursing education: A grounded theory study', *Journal of Nursing Education*, 57(6), pp. 347–353. Available at: https://doi.org/10.3928/01484834-20180522-05.

Moabi, P.S. and Mtshali, N.G. (2021) 'Nursing education institutions' readiness to fully implement simulation-based education in Lesotho', *Africa Journal of Nursing and Midwifery*, 23(1), pp. 1–18. Available at: https://doi.org/10.25159/2520-5293/8686.

Moorthie, S. and Harris, J. (2021) *Clinical utility*. The UK. Available at: https://www.phgfoundation.org/explainer/clinical-utility.

Moran, V., Wunderlich, R. and Rubbelke, C. (2018) 'Simulation: Best practices in nursing education', *Clinical Simulation in Nursing*, 16, pp. 1–54. Available at: https://doi.org/10.1007/978-3-319-89821-6.

Morgan, D.L. (2014) 'Pragmatism as a paradigm for mixed methods research', in *In: Integrating Qualitative and Quantitative Methods : A Pragmatic Approach*. 55: SAGE Publications, Inc. Available at: https://doi.org/10.4135/9781544304533.

Morrow, M.R. (2018) ' Monograph Review: The NLN Jeffries Simulation Theory (2016), edited by Pamela R. Jeffries ', *Nursing Science Quarterly*, 31(4), pp. 392–392. Available at: https://doi.org/10.1177/0894318418792894.

Morse, C.J., Kardong-Edgren, S. and Barlow, M. (2019) 'The Changing Landscape of Simulation-Based Education', *American Journal of Nursing*, 119(8), pp. 42–48. Available at: https://doi.org/10.1097/01.NAJ.0000577436.23986.81.

Morse, J. (2010) 'Procedures and Practice of Mixed Method Design : Maintaining Control,

Rigour, and Complexity', in A. Tashakkori and C. Teddlie (eds) *SAGE Handbook of Mixed Methods in Social & Behavioral Research*. Thousand Oaks: Sage Publications, Inc, pp. 339–352. Available at: https://doi.org/10.4135/9781506335193.

Morton, S.B. and Hatley, A. (2021) 'The Effect of High-Fidelity Simulation on MedicalSurgical Nurses ' Mock Code Performance and', *MedSurg Nursing*, 28(3), pp. 177–183.

Motola, I. *et al.* (2013) 'Simulation in healthcare education: A best evidence practical guide. AMEE Guide No. 82', *Medical Teacher*, 35(10), pp. 142–159. Available at: https://doi.org/10.3109/0142159X.2013.818632.

Moulton, M.C. *et al.* (2017) 'A CLEAR Approach for the Novice Simulation Facilitator', *Teaching and Learning in Nursing*, 12(2), pp. 136–141. Available at: https://doi.org/10.1016/j.teln.2016.11.003.

Mücke, U., Grigull, L., Sänger, B., Berndt, L.P., Wittenbecher, H., …….Tiroke, P. (2020) 'Introducing Low-Cost Simulation Equipment for Simulation-Based Team Training', *Clinical Simulation in Nursing*, 38, pp. 18–22. Available at: https://doi.org/10.1016/j.ecns.2019.09.001.

Munangatire, T. and Naidoo, N. (2017) 'Exploration of high-fidelity simulation: Nurse educators' perceptions and experiences at a school of nursing in a resource-limited setting', *African Journal of Health Professions Education*, 9(1), p. 44. Available at: https://doi.org/10.7196/ajhpe.2017.v9i1.739.

Munn, Z., Peters, M.D.J., Stern, C., Tufanaru, C., McArthur, A. and Aromataris, E. (2018) 'Systematic review or scoping review ? Guidance for authors when choosing between a systematic or scoping review approach', *BMC Medical Research Methodology*, 18, p. 143. Available at: https://doi.org/10.1186/s12874-018-0611-x.

Murray, B.A. (2014) 'The Use of High-fidelity Simulation in Psychiatric and Mental Health Nursing Clinical Education The Use of High-fidelity Simulation in Psychiatric and Mental Health Nursing Clinical Education', *International Journal of Health Sciences Education*, 2(1), pp. 1–14. Available at: http://dc.etsu.edu/ijhse/vol2/iss1/3.

Murthy, S.S., Ntirenganya, F., Scott, J.W., Ingabire, A., Rosman, D., ….. Riviello, R. (2020) ‘A Randomized Cross-Over Trial Focused on Breast Core Needle Biopsy Skill Acquisition and Safety Using High Fidelity Versus Low Fidelity Simulation Models in Rwanda’, *Journal of Surgical Education*, 77(2), pp. 404–412. Available at: https://doi.org/10.1016/j.jsurg.2019.11.014.

Najjuma, J.N., Bajunirwe, F., Twine, M., Namata, T., Kyakwera, C.K., Cherop, M. and Santorino, D.N. (2020) ‘Stakeholder perceptions about the establishment of medical simulation-based learning at a university in a low resource setting: a qualitative study in Uganda’, *BMC Medical Education*, 20(1), pp. 1–10. Available at: https://doi.org/10.1186/s12909-020-02301-3.

Nehring, W.M., Ellis, W.E. and Lashley, F.R. (2001) ‘Human patient simulators in nursing education : An overview’, *Simulation and Gaming*, 32(2), pp. 194–204.

Nehring, W.M., Hughes, F. and Greenwell, A. (2013) ‘Faculty Development for the Use of High-Fidelity Patient Simulation : A Systematic Review’, *International Journal of Health Sciences Education*, 1(1). Available at: https://dc.etsu.edu/ijhse/vol1/iss1/4.

Nehring, W.M. and Lashely, F.R. (2009) ‘Nursing Simulation : A Review of the Past 40 Years’, *Simulation and Gaming*, 40(4), pp. 528–552. Available at: https://doi.org/10.1177/1046878109332282.

Nestel, D., Bearman, M., Brooks, P., Campher, D., Freeman, K., …..Watson, Ma. (2016) ‘A national training program for simulation educators and technicians: Evaluation strategy and outcomes’, *BMC Medical Education*, 16(1), pp. 1–13. Available at: https://doi.org/10.1186/s12909-016-0548-x.

Nestel, D., Kelly, M., Jolly, B. and Watson, M. (2017) *Healthcare Simulation Education: Evidence, Theory and Practice*. Chichester (UK): Wiley-Blackwell. Available at: https://book4you.org/book/3377473/ec610f.

Nestel, D., Hui, J., Kunkler, K., Scerbo, M.W. and Calhoun, A.W. (2019) *Healthcare Simulation Research: A Practical Guide*, *Healthcare Simulation Research*. Gewerbestrasse: Spinger. Available at: https://doi.org/10.1007/978-3-030-26837-4.

Nestel, D. and Bearman, M. (2015) 'Theory and Simulation-Based Education: Definitions, Worldviews and Applications', *Clinical Simulation in Nursing*, 11(8), pp. 349–354. Available at: https://doi.org/10.1016/j.ecns.2015.05.013.

Nicolaides, M. et al. (2020) 'Team Performance Training for Medical Students: Low vs High Fidelity Simulation', Journal of the American College of Surgeons, 231(4), p. e201. Available at: https://doi.org/10.1016/j.jamcollsurg.2020.08.535.

Nippita, S. et al. (2018) 'Randomized trial of high-and low-fidelity simulation to teach intrauterine contraception placement', American Journal of Obstetrics and Gynecology, 218(2), pp. 258.e1-258.e11. Available at: https://doi.org/10.1016/j.ajog.2017.11.553.

NLN (2015) *A Vision for Teaching with Simulation: A Living Document from the National League for Nursing NLN Board of Governors*. Available at: http://www.nln.org/docs/defaultsource/about/nln-vision-series-(position-statements)/vision-statement-a-vision-forteaching-with-simulation.pdf?sfvrsn=2 (Accessed: 21 September 2020).

Novakowski, N. (2008) 'Using the Delphi technique in normative planning research : methodological design considerations', *Environmental and Planning*, 40(6), pp. 1485–1500. Available at: https://doi.org/10.1068/a39267.

Ntlokonkulu, Z.B., Rala, N.M. 'Deline and Goon, D. Ter (2018) 'Medium-fidelity simulation in clinical readiness: A phenomenological study of student midwives concerning teamwork', *BMC Nursing*, 17(1), pp. 1–8. Available at: https://doi.org/10.1186/s12912-018-0303-1.

Oermann, M.H. and Gaberson, K.B. (2014) *Evaluation and Testing in Nursing Education*. 4th ed. New York: Springer Publishing Company, LLC.

Oh, P.-J., Jeon, K.D. and Koh, M.S. (2015) ‘The effects of simulation-based learning using standardized patients in nursing students: A meta-analysis’, *Nurse Education Today*, 35(5), pp. e6–e15. Available at: https://doi.org/https://doi.org/10.1016/j.nedt.2015.01.019.

Olson, J.K., Paul, P., Lasiuk, G., Davidson, S., Wilson-Keates, B., Ellis, R.,….. and. Savard, Winnifred. (2018) ‘The State of Knowledge Regarding the Use of Simulation in Pre-Licensure Nursing Education: A Mixed Methods Systematic Review’, *International Journal of Nursing Education Scholarship*, 15(1), pp. 1–13. Available at: https://doi.org/10.1515/ijnes-2017-0050.

Orr, F., Kellehear, K., Armari, E., Pearson, A. and Holmes, D. (2013) ‘The distress of voice-hearing: The use of simulation for awareness, understanding and communication skill development in undergraduate nursing education’, *Nurse Education in Practice*, 13(6), pp. 529–535. Available at: https://doi.org/10.1016/j.nepr.2013.03.023.

Oudshoorn, A. and Sinclair, B. (2015) ‘Using Unfolding Simulations to Teach Mental Health Concepts in Undergraduate Nursing Education’, *Clinical Simulation in Nursing*, 11(9), pp. 396–401. Available at: https://doi.org/10.1016/j.ecns.2015.05.011.

Owen, H. (2016) *Simulation in Healthcare Education: AN Extensive History*. New York: Springer International Publishing Switzerland. Available at: https://doi.org/10.1007/978-3319-26577-3.

Page-Cutrara, K. and Turk, M. (2017) ‘Impact of prebriefing on competency performance, clinical judgment and experience in simulation: An experimental study’, *Nurse Education Today*, 48, pp. 78–83. Available at: https://doi.org/10.1016/j.nedt.2016.09.012.

Paige, J.B. and Morin, K.H. (2013) ‘Simulation fidelity and cueing: A systematic review of the literature’, *Clinical Simulation in Nursing*, 9(11), pp. e481–e489. Available at: https://doi.org/10.1016/j.ecns.2013.01.001.

Parker, B.A. and Grech, C. (2018) ‘Authentic practice environments to support undergraduate nursing students’ readiness for hospital placements. A new model of practice

in an on-campus simulated hospital and health service', *Nurse Education in Practice*, 33(December 2017), pp. 47–54. Available at: https://doi.org/10.1016/j.nepr.2018.08.012.

Parker, K.C. and Welch, T.D. (2021) 'Innovative teaching strategies to escape the anxiety in simulation', *Teaching and Learning in Nursing*, 16(4), pp. 414–417. Available at: https://doi.org/10.1016/j.teln.2021.06.005.

Peachey, L. (2021) 'Nurse Education Today Shaping Clinical Imagination as New Graduate Nurses in maternal-child Simulation', *Nurse Education Today*, 97(October 2020), p. 104668. Available at: https://doi.org/10.1016/j.nedt.2020.104668.

Peters, M.D.J., Peters, M.D.J., Godfrey, C.M., Khalil, H., McInerney, P., Parker, D., and Soares, C.B. (2015) 'Guidance for conducting systematic scoping reviews', *International Journal of Evidence-Based Healthcare*, 13(3), pp. 141–146. Available at: https://doi.org/10.1097/XEB.0000000000000050.

Peters, M.D.J., Godfrey, C.M., McInerney, P., Soares, C.B. and Khalil, H. (2015) *The Joanna Briggs Institute Reviewers ' Manual 2015 Methodology for JBI Scoping Reviews*. Edited by E. Aromataris. Adelaide: The Joanna Briggs Institute. Available at: https://nursing.lsuhsc.edu/JBI/docs/ReviewersManuals/Scoping-.pdf (Accessed: 27 August 2020).

Peters, M.D.J., Godfrey, C.M., McInerney P., Munn, Z., Tricco, A.C. and Khalil, H. (2017) 'Chapter 11 : Scoping Reviews', in E. Aromataris and Z. Munn (eds) *JBI Reviewer's Manual*. Adelaide: The Joanna Briggs Institute. Available at: https://reviewersmanual.joannabriggs.org/.

Peters, M.D.J., Marnie, C., Tricco, A.C., Pollock, D., Munn, Z., ……and Khalil, H. (2020) 'Updated methodological guidance for the conduct of scoping reviews', *JBI Evidence Synthesis*, 18(10), pp. 2119–2126. Available at: https://doi.org/10.11124/JBIES-20-00167.

Peters, M.D.J., Marnie, C., Tricco, A.C., Pollock, D., Munn, Z., ……and Khalil, H. (2021)

'Updated methodological guidance for the conduct of scoping reviews', *JBI evidence implementation*, 19(1), pp. 3–10. Available at: https://doi.org/10.1097/XEB.0000000000000277.

Peters, M.D.J., Godfrey, C., McInerney, P., Khalil, H., Larsen, P., Marnie, C., and Munn, Z. (2022) 'Best practice guidance and reporting items for the development of scoping review protocols', *JBI Evidence Synthesis*, 20(4), pp. 953–968. Available at: https://doi.org/10.11124/JBIES-21-00242.

Pham, M.T., Greig, J.D., Sargeant, J.M. and Mcewen, S.A (2015) 'A scoping review of scoping reviews : advancing the approach and enhancing the consistency', *Research Synthesis Methods*, 5(June 2014), pp. 371–385. Available at: https://doi.org/10.1002/jrsm.1123.

Piot, M.A. *et al.* (2020) 'Simulation in psychiatry for medical doctors: A systematic review and meta-analysis', *Medical Education*, 54(8), pp. 696–708. Available at: https://doi.org/10.1111/medu.14166.

Piot, M.A. *et al.* (2021) 'Effectiveness of simulation in psychiatry for nursing students, nurses and nurse practitioners: A systematic review and meta-analysis', *Journal of Advanced Nursing*, (February), pp. 1–16. Available at: https://doi.org/10.1111/jan.14986.

Plano Clark, V.L. and Badiee, M. (2010) *Research Questions in Mixed Methods, In SAGE Handbook of Mixed Methods in Social & Behavioural Research*. Edited by A. Tashakkori and C. Teddlie. Thousand Oaks: Sage Publications, Inc. Available at: https://doi.org/10.4135/9781506335193.

Polit, D.F. and Beck, C.T. (2017) *Nursing Research: Generating and Assessing Evidence for Nursing Practice*. 10th ed. Philadelphia: Lippincott Wolters Kluwer.

Polit, D.F. and Beck, C.T. (2018) *Essentials of Nursing Research: Appraising evidence for nursing practice*. 9th ed. Philadelphia: Wolters Kluwer Health | Lippincott Williams & Wilkins.

Pollock, D. *et al.* (2021) ‘Undertaking a scoping review: A practical guide for nursing and midwifery students, clinicians, researchers, and academics’, *Journal of Advanced Nursing*, 77(4), pp. 2102–2113. Available at: https://doi.org/10.1111/jan.14743.

Qaisar, R. et al. (2020) ‘The Perceived Usefulness of Digital Simulators in the Acquisition of Professional Competencies by Undergraduate Nursing Students’, International Journal of Emerging Technologies in Learning, 15(22), pp. 258–265. Available at: https://doi.org/10.3991/ijet.v15i22.17023.

Rea, L.M. and Parker, R.A. (2014) *Designing and Conducting Survey RESEARCH: A Comprehensive Guide*. 4th ed. San Francisco: Jossey-Bass A Wiley Brand.

Redmond, C. *et al.* (2020) ‘Increasing competence in wound care: A cross-sectional study to evaluate the use of a virtual patient by undergraduate student nurses’, *Nurse Education in Practice*, 44(March), p. 102774. Available at: https://doi.org/10.1016/j.nepr.2020.102774.

Reibel, M.D., Cason, M. and Screws, S. (2019) ‘Creating a Simulation Experience to Promote Clinical Judgment’, *Teaching and Learning in Nursing*, 14(4), pp. 298–302. Available at: https://doi.org/10.1016/j.teln.2019.07.001.

Reid, C.A. *et al.* (2020) ‘High-Fidelity Simulation and Clinical Judgment of Nursing Students in a Maternal–Newborn Course’, *Western Journal of Nursing Research*, 42(10), pp. 829–837. Available at: https://doi.org/10.1177/0193945920907395.

Reynolds, S., Cooper-Stanton, G. and Potter, A. (2018) ‘Real-time simulation: First-hand experience of the challenges of community nursing for students’, *British Journal of Community Nursing*, 23(4), pp. 180–183. Available at: https://doi.org/10.12968/bjcn.2018.23.4.180.

Riabtseva, N., Reynolds, A. and Gisin, M. (2015) *Establishing a Simulation Center: Essentials and Guidelines*. Available at: https://www.researchgate.net/publication/316582196_Establishing_a_Simulation_Center_Essentials_and_Guidelines (Accessed: 16 November 2020).

Riaz, S. (2019) ‘How simulation-based medical education can be started in low resource settings’, *Journal of Ayub Medical College, Abbottabad : JAMC*, 31(4), pp. 636–637.

Ricketts, B., Merriman, C. and Stayt, L. (2012) ‘Simulated practice learning in a preregistration programme’, *British Journal of Nursing*, 21(7), pp. 435–440. Available at: https://doi.org/10.12968/bjon.2012.21.7.435.

Riley, R.H. (2016) *Manual of Simulation in Healthcare*. 2nd ed. New York: Oxford University Press.

Roberts, E., Kaak, V. and Rolley, J. (2019) ‘Simulation to Replace Clinical Hours in Nursing: A Meta-narrative Review’, *Clinical Simulation in Nursing*, 37, pp. 5–13. Available at: https://doi.org/10.1016/j.ecns.2019.07.003.

Robinson, B.K. and Dearmon, V. (2013) ‘Evidence-based nursing education: Effective use of instructional design and simulated learning environments to enhance knowledge transfer in undergraduate nursing students’, *Journal of Professional Nursing*, 29(4), pp. 203–209.

Available at: https://doi.org/10.1016/j.profnurs.2012.04.022.

Roziers, R.L., Kyriacos, U. and Ramugondo, E.L. (2014) ‘Newly qualified South African nurses’ lived experience of the transition from student to community service nurse: A phenomenological study’, Journal of Continuing Education in Nursing, 45(2), pp. 91–100. Available at: https://doi.org/10.3928/00220124-20140122-01.

Rudolph, J.W. *et al.* (2016) ‘A DASH to the Top: Educator Debriefing Standards as a Path to Practice Readiness for Nursing Students’, *Clinical Simulation in Nursing*, 12(9), pp. 412–417. Available at: https://doi.org/https://doi.org/10.1016/j.ecns.2016.05.003.

Rudolph, J.W., Raemer, D.B. and Simon, R. (2014) ‘Establishing a safe container for learning in simulation the role of the presimulation briefing’, *Simulation in Healthcare*, 9(6), pp. 339–349. Available at: https://doi.org/10.1097/SIH.0000000000000047.

Rutherford-Hemming, T. (2012a) ‘Learning in simulated environments: Effect on learning transfer and clinical skill acquisition in nurse practitioner students’, *Journal of Nursing Education*, 51(7), pp. 403–406. Available at: https://doi.org/10.3928/01484834-20120427-

04.

Rutherford-Hemming, T. (2012b) ‘Simulation Methodology in Nursing Education and Adult Learning Theory’, *Adult Learning*. Available at: https://doi.org/10.1177/1045159512452848.

Rutherford-Hemming, T., Lioce, L. and Breymier, T. (2019) ‘Guidelines and Essential Elements for Prebriefing’, *Simulation in Healthcare*, 14(6), pp. 409–414. Available at: https://doi.org/10.1097/SIH.0000000000000403.

Ruyak, S.L. *et al.* (2018) ‘Role development in midwifery education: A place for simulation’, *Midwifery*, 59(January), pp. 141–143. Available at: https://doi.org/10.1016/j.midw.2018.01.021.

SANC (2020) ‘Extension of Education and Training to meet outstanding clinical requirements’. Pretoria: South African Nursing Council. Available at: https://www.sanc.co.za/2020/11/06/extension-of-education-and-training-to-meetoutstanding-clinical-requirements/. Circular 11/2020.

Sando, C.R. *et al.* (2013) ‘Standards of Best Practice: Simulation Standard VII: Participant Assessment and Evaluation’, *Clinical Simulation in Nursing*, 9(6 SUPPL), pp. S30–S32. Available at: https://doi.org/10.1016/j.ecns.2013.04.007.

Saqe-Rockoff, A., Ciardiello, A. V. and Schubert, F.D. (2019) ‘Low-Fidelity, In-Situ Pediatric Resuscitation Simulation Improves RN Competence and Self-Efficacy’, *Journal of Emergency Nursing*, 45(5), pp. 538–545. Available at: https://doi.org/10.1016/j.jen.2019.02.003.

Sawaya, R.D. *et al.* (2021) ‘Simulation-based curriculum development: lessons learnt in Global Health education’, *BMC Medical Education*, 21(33), pp. 1–6.

Sawyer, T. *et al.* (2016) ‘More Than One Way to Debrief: A Critical Review of Healthcare Simulation Debriefing Methods’, *Simulation in Healthcare*, 11(3), pp. 209–217. Available at: https://doi.org/10.1097/SIH.0000000000000148.

Schatz, S. *et al.* (2013) 'Human–Systems Integration, Simulation, and the Nursing Shortage', *Proceedings of the International Symposium on Human Factors and Ergonomics in Health Care*, 2(1), pp. 135–142. Available at: https://doi.org/10.1177/2327857913021026.

Schneidereith, T.A., Leighton, K. and Foisy-Doll, C. (2020) 'Operationalizing a simulation program: Practical information for leadership', *Nursing Forum*, 55(4), pp. 569–574. Available at: https://doi.org/10.1111/nuf.12463.

Seam, N. *et al.* (2019) 'Simulation Training in the ICU', *Chest*, 156(6), pp. 1223–1233. Available at: https://doi.org/10.1016/j.chest.2019.07.011.

Seaton, P. *et al.* (2019) 'Exploring the extent to which simulation-based education addresses contemporary patient safety priorities: A scoping review', *Collegian*, 26(1), pp. 194–203. Available at: https://doi.org/10.1016/j.colegn.2018.04.006.

Seed Global Health (2019) *Entry-To-Practice Exam: Mapping The Way Forward For Nursing Licensure In Eswatini*. Available At: Https://Seedglobalhealth.Org/Entry-to-practice-exammapping-the-way-forward-for-nursing-licensure-in-eswatini/#.YJJ-0LUzZPY. Accessed: 19 January 2021

Seropian, Michael A *et al.* (2004) 'An Approach to Simulation Program', *Journal of Nursing Education*, 43(4), pp. 170–175.

Seropian, Michael A. *et al.* (2004) 'Simulation: Not just a manikin', *Journal of Nursing Education*, 43(4), pp. 164–169. Available at: https://doi.org/10.3928/01484834-20040401-04.

Servotte, J.C., Ghuysen, A. and Bragard, I. (2019) *When simulation should and should not be in the curriculum*, *Clinical Simulation: Education, Operations and Engineering*. Elsevier Inc. Available at: https://doi.org/10.1016/B978-0-12-815657-5.00018-8.

Sexton, M., Stobbe, B. and Lessick, M. (2012) 'Advancing Medical-Surgical Nursing Through Simulation Simulation', *Med-Surg Matters*, 21(3/4), pp. 24–28. Available at: https://search.ebscohost.com/login.aspx?direct=true&db=ccm&AN=104471862&site=ehost-live&scope=site.

Shah, A.P. *et al.* (2023) 'Integrating simulation into surgical training: a qualitative case study of a national programme', *Advances in Simulation*, 8(1), pp. 1–11. Available at: https://doi.org/10.1186/s41077-023-00259-y.

Shaw-Battista, J. *et al.* (2015) 'Successes and Challenges of Interprofessional Physiologic Birth and Obstetric Emergency Simulations in a Nurse-Midwifery Education Program', *Journal of Midwifery and Women's Health*, 60(6), pp. 735–743. Available at: https://doi.org/10.1111/jmwh.12393.

Shellenbarger, T. and Edwards, T. (2012) 'Nurse Educator Simulation: Preparing Faculty for Clinical Nurse Educator Roles', *Clinical Simulation in Nursing*, 8(6), pp. e249–e255. Available at: https://doi.org/https://doi.org/10.1016/j.ecns.2010.12.006.

Sittner, B.J. *et al.* (2015) 'INACSL Standards of Best Practice for Simulation: Past, present, and Future', *Nursing Education Perspectives*, 36(5), pp. 294–298. Available at: https://doi.org/10.5480/15-1670.

Smart, A. (2006) 'A multi-dimensional model of clinical utility', *International Journal for Quality in Health Care*, 18(5), pp. 377–382. Available at: https://doi.org/10.1093/intqhc/mzl034.

Sofer, D. (2018) 'The Value of Simulation in Nursing', *American Journal of Nursing*, 118(4), pp. 17–18. Available at: https://www.nursingcenter.com/journalarticle?Article_ID=4594718&Journal_ID=54030&Issue_ID=4594662 (Accessed: 22 October 2020).

Solli, H. *et al.* (2020) 'The art of balancing: the facilitator's role in briefing in simulation-based learning from the perspective of nursing students – a qualitative study', *BMC Nursing*, 19(1), pp. 1–11. Available at: https://doi.org/10.1186/s12912-020-00493-z.

South African Nursing Council (2021) *Education And Training Guidelines For Postgraduate Diploma Programmes*. South Africa. Available at: https://www.sanc.co.za/education-andtraining/. Accessed: 18 December 2020.

Southern Africa Nazarene University (2021) *History of the Faculty of Health Sciences*, *Yati Marketing*. Available at: http://www.sanu.ac.sz/healthsciences/history-of-thefaculty/#:~:text= Accessed: 3 February 2021.

Spranger, J. *et al.* (2022) 'Reporting guidelines for Delphi techniques in health sciences: A methodological review', *Evidence in Health Care Reporting*, 172, pp. 1–11. Available at: https://doi.org/10.1016/j.zefq.2022.04.025.

Srivastava, P. and Hopwood, N. (2009) 'A Practical Iterative Framework for Qualitative Data Analysis', *International Journal of Qualitative Methods*, 8(1), pp. 76–84. Available at: https://doi.org/10.1177/160940690900800107.

Strauss, E. *et al.* (2016) 'Do orientation programs help new graduates?', *Nurse Education Today*, 36, pp. 422–426. Available at: https://doi.org/10.1016/j.nedt.2015.09.002.

Swanston, B. and Keilman, L. (2023) *Everything you need to know about BSN degrees*, *Forbes Advisor*. Available at: https://doi.org/https://www.forbes.com/advisor/education/bachelors-in-nursing/.

Swanwick, T., Forrest, K. and O'Brien, B.C. (2018) *Understanding Medical Education: Evidence, Theory, and Practice*, *Understanding Medical Education: Evidence, Theory, and Practice*. Chichester (UK): Wiley-Blackwell. Available at: https://doi.org/10.1002/9781119373780.ch1.

Swart, R., Duys, R. and Hauser, N.D. (2019) 'Sass: South African simulation survey – a review of simulation-based education', *Southern African Journal of Anaesthesia and Analgesia*, 25(4), pp. 12–20. Available at: https://doi.org/10.36303/sajaa.2019.25.4.2191.

Taplay, K. *et al.* (2014) 'Organizational Culture Shapes the Adoption and Incorporation of Simulation into Nursing Curricula: A Grounded Theory Study, *Nursing Research and Practice*, 2014, pp. 1–12. Available at: https://doi.org/10.1155/2014/197591.

Taplay, K. *et al.* (2015) 'The Process of Adopting and Incorporating Simulation Into Undergraduate Nursing Curricula: A Grounded Theory Study, *Journal of Professional Nursing*, 31(1), pp. 26–36. Available at: https://doi.org/10.1016/j.profnurs.2014.05.005.

Taylor, L. (2004) 'Educational Theories and Instructional Design Models: Their Place in Simulation', *Health* [Preprint]. Available at: https://www.researchgate.net/publication/229039487_Educational_Theories_and_Instructional_Design_Models_Their_Place_in_Simulation. Accessed 11 September 2022.

Teddlie, C. and Tashakkori, A. (2009) *Foundations of Mixed Methods Research: Integrating Quantitative and Qualitative Approaches in the Social and Behavioral Sciences Charles*. Thousand Oaks: Sage Publications, Inc.

Teteris, E. *et al.* (2012) 'Does training learners on simulators benefit real patients?', *Advances in Health Sciences Education*, 17(1), pp. 137–144. Available at: https://doi.org/10.1007/s10459-011-9304-5.

The INASCL Board of Directors (2011) 'Standard VI: The Debriefing Process', *Clinical Simulation in Nursing*, 7(4), pp. S16–S17. Available at: https://doi.org/10.1016/j.ecns.2011.05.010.

The World Bank Group (2019) *Population, total - Eswatini*. Available at: https://www.google.com/search?q=Population%2C+total+-+Eswatini&oq=Population%2C+total+-+Eswatini&aqs=chrome..69i57j0i22i30j69i61.1359j0j7&sourceid=chrome&ie=UTF-8 (Accessed: 18 October 2020).

Thurling, C.H. (2017) *The Design and Development of a Programme for Simulation Best Practice in South African Nursing Education Institutions*. The University of the Witwatersrand. Available at: http://wiredspace.wits.ac.za/jspui/bitstream/10539/23150/1/HT Thesis Final Formatted with Annexures 20170605.pdf.

Thurling, C.H., Herrington, A. and Hawkins, K. (2016) 'Integrating Simulation Into The Curriculum: Recommendations for Integration', in, p. 126. Available at: https://sigma.nursingrepository.org/bitstream/handle/10755/616525/66_Thurling_C_p78779_1.pdf?sequence=1.

Tjoflåt, I., Koyo, S.L. and Bø, B. (2021) 'Simulation-based education as a pedagogic method in nurse education programmes in sub-Saharan Africa – Perspectives from nurse teachers',

Nurse Education in Practice, 52(March), p. 103037. Available at: https://doi.org/10.1016/j.nepr.2021.103037.

Tjoflåt, I. and Våga, B.B. (2017) 'Implementing simulation in a nursing education programme : a case report from Tanzania', *Advances in Simulation*, 2(17), pp. 4–7. Available at: https://doi.org/10.1186/s41077-017-0048-z.

Tosterud, R. (2015) *Simulation used as a learning approach in nursing education Students ' experiences and validation of evaluation questionnaires*. Karlstad University. Available at: https://www.diva-portal.org/smash/get/diva2:760893/fulltext01.pdf.

Tricco, A.C. *et al.* (2018) 'PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation', *Annals of Internal Medicine*, 169(7), pp. 467–473. Available at: https://doi.org/10.7326/M18-0850.

Tseng, L.P. *et al.* (2021) 'Effectiveness of applying clinical simulation scenarios and integrating information technology in medical-surgical nursing and critical nursing courses', *BMC Nursing*, 20(1), pp. 1–15. Available at: https://doi.org/10.1186/s12912-021-00744-7.

Tsuda, S., Mohsin, A. and Jones, D. (2015) 'Financing a Simulation Center', *Surgical Clinics of North America*, 95(4), pp. 791–800. Available at: https://doi.org/10.1016/j.suc.2015.03.002.

Tyerman, J. *et al.* (2016) 'Pre-simulation preparation and briefing practices for healthcare professionals and students: a systematic review protocol', *JBI Database of Systematic Reviews and Implementation Report*, 14(8), pp. 80–89. Available at: https://doi.org/10.11124/JBISRIR-2016-003055.

Tyerman, J. *et al.* (2019) 'A Systematic Review of Health Care Presimulation Preparation and Briefing Effectiveness', *Clinical Simulation in Nursing*, 27, pp. 12–25. Available at: https://doi.org/https://doi.org/10.1016/j.ecns.2018.11.002.

USAID (2015) *Health & Finance Governance (HFG) Kingdom of Eswatini: Final Report 2012-2018*.

Uys, L.R. and Gwele, N.S. (2005) *Curriculum Development in Nursing: Process and Innovation*. London: Routledge Taylor & Francis Group. Available at: https://doi.org/http://dx.doi.org/10.4324/9780203313343.

Verkuyl, M. *et al.* (2020) 'Exploring Debriefing Combinations After a Virtual Simulation', *Clinical Simulation in Nursing*, 40, pp. 36–42. Available at: https://doi.org/10.1016/j.ecns.2019.12.002.

Verkuyl, M. *et al.* (2022) 'Virtual Gaming Simulation: Evaluating Players' Experiences', *Clinical Simulation in Nursing*, 63, pp. 16–22. Available at: https://doi.org/https://doi.org/10.1016/j.ecns.2021.11.002.

Verma, J.P. and Verma, P. (2020) *Determining Sample Size and Power in Research Studies: A Manual for Researchers*. Gateway East: Springer Nature Singapore Pte Ltd. Available at: https://doi.org/10.1007/978-981-15-5204-5. van Vuuren, V.J., Seekoe, E. and Goon, D.T. (2018) 'The perceptions of nurse educators regarding the use of high fidelity simulation in nursing education', *Africa Journal of Nursing and Midwifery*, 20(1), pp. 1–21. Available at: https://doi.org/10.25159/2520-5293/1685.

Waldner, M.H. and Olson, J.K. (2007) 'Taking the patient to the classroom: Applying theoretical frameworks to simulation in nursing education', *International Journal of Nursing Education Scholarship*, 4(1). Available at: https://doi.org/10.2202/1548-923X.1317.

Wall, P., Andrus, P.M. and Morrison, P. (2014) 'Bridging the Theory Practice Gap through Clinical Simulations in a Nursing Undergraduate Degree Program in Australia', *International Journal of Learning, Teaching and Educational Research*, 8(1), pp. 127–135.

Watts, P.I. *et al.* (2020) 'Sustaining global partnerships for simulation integration: lessons from the field', *International Nursing Review*, 67(2), pp. 168–172. Available at: https://doi.org/10.1111/inr.12570.

Waxman, K.T. (2010) 'The development of evidence-based clinical simulation scenarios: Guidelines for nurse educators', *Journal of Nursing Education*, 49(1), pp. 29–35. Available at: https://doi.org/10.3928/01484834-20090916-07.

Waxman, K.T. and Telles, C.L. (2009) 'The Use of Benner's Framework in High-fidelity Simulation Faculty Development. The Bay Area Simulation Collaborative Model', *Clinical Simulation in Nursing*, 5(6), pp. e231–e235. Available at: https://doi.org/10.1016/j.ecns.2009.06.001.

Weaver, A. (2011) 'High-Fidelity Patient Simulation in Nursing Education: An Integrative Review', *Nursing Education Perspectives (National League for Nursing*, 32(1), pp. 37–40. Available at: https://doi.org/10.5480/1536-5026-32.1.37.

Weller, J.M. *et al.* (2012) 'Simulation in clinical teaching and learning', *Medical Journal of Australia*, 196(9), pp. 1–5. Available at: https://doi.org/10.5694/mja10.11474.

Wentz, E.A. (2014) 'The Literature Review', in *In: How to Design, Write, and Present a Successful Dissertation Proposal*. 55 City Road: SAGE Publications Ltd, pp. 81–95. Available at: https://doi.org/https://dx.doi.org/10.4135/9781506374710.

West, A.J., Kim, B. and Parchoma, G. (2017) 'Towards an enhanced conceptualization of fidelity for instructional design in simulation-based respiratory therapy education', *Canadian Journal of Respiratory Therapy*, 53(4), pp. 69–74.

Wheeler, C.A. and McNelis, A.M. (2014) 'Nursing student perceptions of a community-based home visit experienced by a role-play simulation', *Nursing Education Perspectives*, 35(4), pp. 259–261. Available at: https://doi.org/10.5480/12-932.1.

White, M. (2017) 'Keep Calm and Simulate On: Faculty Experiences and Insights Into Implementing Best Practices in Simulation', *Teaching and Learning in Nursing*, 12(1), pp. 43–49. Available at: https://doi.org/https://doi.org/10.1016/j.teln.2016.10.003.

WHO (2013) *Transforming and scaling up health professionals' education and training*, *World Health Organization guidelines 2013*. Geneva: WHO Library Cataloguing-inPublication Data. Available at: https://doi.org/10.1017/CBO9781107415324.004.

Wijk, H. *et al.* (2021) 'Successful implementation of change in postgraduate medical education – a qualitative study of programme directors', *BMC Medical Education*, 21(1), pp. 1–8. Available at: https://doi.org/10.1186/s12909-021-02606-x.

Wilford, A. and Doyle, T.J. (2006) 'Integrating simulation training into the nursing curriculum.', *British Journal of Nursing (Mark Allen Publishing)*, 15(17), pp. 926–930. Available at: https://doi.org/10.12968/bjon.2006.15.17.21907.

Williams, B. *et al.* (2017) 'Simulation and mental health outcomes: a scoping review', *Advances in Simulation*, 2(1), pp. 1–8. Available at: https://doi.org/10.1186/s41077-0160035-9.

Williams, T. and Spurlock, W. (2019) 'Using High Fidelity Simulation to Prepare Baccalaureate Nursing Students Enrolled in a Historically Black College and University, *ABNF Journal*, 30(2), p. 37.

Wilson, L. *et al.* (2018) 'Community Simulation', in *Poster presentations*. UK: The Association for Simulated Practice in Healthcare, pp. A1–A94. Available at: https://doi.org/10.1136/bmjstel-2018-aspihconf.150.

Wilson, L. and Wittmann-Price, R.A. (2015) *Review Manual for the Certified Healthcare Simulation Educator (CHSE) Exam ™*. New York: Springer Publishing Company.

Wordsworth, A. (2013) 'Realising the potential of simulation: Integrating simulation into nursing programmes at Whitireia New Zealand', *Whitireia Nursing & Health Journal*, 20(November), pp. 11–18.

Wotton, K. *et al.* (2010) 'Third-year undergraduate nursing students' perceptions of high-fidelity simulation', *Journal of Nursing Education*, 49(11), pp. 632–639. Available at: https://doi.org/10.3928/01484834-20100831-01.

Van Wyk, R., Labuschagne, M.J. and Joubert, G. (2020) 'Simulation as an educational strategy to deliver interprofessional education', *African Journal of Health Professions Education*, 12(2), p. 74. Available at: https://doi.org/10.7196/ajhpe.2020.v12i2.1213.

Young, P.K. and Shellenbarger, T. (2012) 'Interpreting the NLN Jeffries Framework in the context of nurse educator preparation', *Journal of Nursing Education*, 51(8), pp. 422–428. Available at: https://doi.org/10.3928/01484834-20120523-02.

Zamanzadeh, V. *et al.* (2015) 'Lack of Preparation: Iranian Nurses' Experiences During Transition From College to Clinical Practice', *Journal of Professional Nursing*, 31(4), pp. 365–373. Available at: https://doi.org/10.1016/j.profnurs.2015.01.005.

Zhang, C., Thompson, S. and Miller, C. (2011) 'A Review of Simulation-Based Interprofessional Education', *Clinical Simulation in Nursing*, 7(4), pp. e117–e126. Available at: https://doi.org/10.1016/j.ecns.2010.02.008.

Zigmont, J.J., Kappus, L.J. and Sudikoff, S.N. (2011) 'Theoretical Foundations of Learning Through Simulation', *Seminars in Perinatology*, 35(2), pp. 47–51. Available at: https://doi.org/10.1053/j.semperi.2011.01.002.

Zitzelsberger, H. *et al.* (2017) 'Exploring Simulation Utilization and Simulation Evaluation Practices and Approaches in Undergraduate Nursing Education', *Journal of Education and Practice*, 8(3), pp. 155–164. Available at: https://eric.ed.gov/?id=EJ1131768 (Accessed: 24 April 2020).

Zwane, Z.P. and Mtshali, N.G. (2019) 'Positioning public nursing colleges in South African higher education: Stakeholders' perspectives', *Curationis*, 42(1), pp. e1–e11. Available at: https://doi.org/10.4102/curationis.v42i1.1885.

ANNEXURES

ANNEXURE 1: TITLE APPROVAL

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Private Bag 3 Wits, 2050
Fax: 027117172119
Tel: 02711 7172076

Reference: Mrs Sandra Benn
E-mail: sandra.benn@wits.ac.za

06 April 2021
Person No: 1044231
PAG

Mrs SS Shongwe
P.O.Box 4150
Manzini
Mbabane
Mbabane
M200
Swaziland

Dear Mrs Sithembile Shongwe

Doctor of Philosophy: Approval of Title

We have pleasure in advising that your proposal entitled *A framework for intergrating simulation into the Bachelor of Nursing Science programme in Eswatini* has been approved. Please note that any amendments to this title have to be endorsed by the Faculty's higher degrees committee and formally approved.

Yours sincerely

Mrs Sandra Benn
Faculty Registrar
Faculty of Health Sciences

ANNEXURE 2: UNIVERSITY OF THE WITWATERSRAND HUMAN RESEARCH ETHICS COMMITTEE CLEARANCE CERTIFICATE

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

R49 Ms SS Shongwe

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
CLEARANCE CERTIFICATE NO. M210334

NAME: (Principal Investigator)	Ms SS Shongwe
DEPARTMENT:	School of Therapeutic Sciences Department of Nursing Education Medical School University
PROJECT TITLE:	*A framework for integrating simulation into the Bachelor of Nursing Science programme in Eswatini*
DATE CONSIDERED:	2021/03/26
DECISION:	Approved unconditionally
CONDITIONS:	
NOTE:	If contact information regarding student study participants is required, please contact the Registrar's office - <Nicoleen.Potgieter@wits.ac.za>
SUPERVISOR:	Drs SJ Armstrong and CH Thurling
APPROVED BY:	Dr CB Penny, Chairperson, HREC (Medical)
DATE OF APPROVAL:	2021/09/30

This Clearance Certificate is valid for 5 years from the date of approval. An extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office secretariat on the 3rd floor, Phillip Tobias Building, Parktown, University of the Witwatersrand, Johannesburg.

I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated from the research protocol as approved, I/we undertake to submit details to the Committee. **I agree to submit a yearly progress report**. When a funder requires annual re-certification, the application date will be one year after the date when the study was initially reviewed. In this case, the study was initially reviewed in March and therefore reports and re-certification will be due in the month of **March** each year. Unreported changes to the study may invalidate the clearance given by the HREC (Medical).

Signature of Principal Investigator

14/10/2021
Date

ANNEXURE 3: ESWATINI HEALTH AND HUMAN RESEARCH REVIEW BOARD PROTOCOL APPROVAL CERTIFICATE (YEAR ONE AND TWO)

ESWATINI
HEALTH AND HUMAN
RESEARCH REVIEW BOARD
MBANDZENI HOUSE, 3RD FLOOR, CHURCH STREET
P.O. BOX 5, MBABANE, ESWATINI

ONE YEAR RESEARCH PROTOCOL APPROVAL CERTIFICATE

BOARD REGISTRATION NUMBER	**FWA 00026661/IRB 00011253**								
PROTOCOL REFERENCE NUMBER	EHHRRB042/2021								
Type of review	Expedited	**X**		Full Board					
Name of Organization	**PHD Student**								
Title of study	A Framework for Integrating Simulation into the Bachelor of Nursing Science Programme in Eswatini								
Protocol version	1.0								
Nature of application	New		Amendment		Renewal		Extension		CT updates
	X								
List of study sites	University of Eswatini, Southern Africa Nazarene University and Eswatini Medical Christian University								
Name of Principal Investigator	**Ms. Sithembile Siphiwe Shongwe**								
Names of Co- Investigators	Dr. Susan Jennifer Armstrong, Dr. Catherine Hilary Thurling and Associate Professor Tengetile Rebecca Mathunjwa-Dlamini								
Names of steering committee members in the case of clinical trials	N/A								
Names of Data and Safety Committee members in the case of clinical trials	N/A								
Level of risk (Tick appropriate box)	Minimal		**More than minimal**		High				
	X								
Initial study Approval information	**Approved**	**X**	**Study completion date**	31/08/2023	**Certificate expiry Date**	09/09/2022			
	Approval date	09/09/2021							
Study renewal approval information	**Renewal date**				**End date**				
Study amendment approval information	**Amendment date**								
Study extension approval information	**Extension date**				**End date**				
Signature of Chairperson									
Signing date	**09/09/2021**								
Secretariat Contact Details	Name of contact officers		**Babazile Shongwe**						
	Email address		ehhrrbeswatini@gmail.com						
	Telephone no.		**(00268) 2404 7751/9553**						

ESWATINI HEALTH & HUMAN RESEARCH REVIEW BOARD
09 SEP 2021
P.O BOX 5, MBABANE H100
TEL: (+268) 2404 7751
EHHRRB

ESWATINI HEALTH AND HUMAN RESEARCH REVIEW BOARD

ONE YEAR RESEARCH PROTOCOL APPROVAL CERTIFICATE

BOARD REGISTRATION NUMBER	**FWA 00026661/IRB 00011253**							
PROTOCOL REFERENCE NUMBER	**EHHRRB099/2022**							
Type of review	Expedited	**X**		Full Board				
Name of Organization	**PHD Student**							
Title of study	**A Framework for Integrating Simulation into the Bachelor of Nursing Science Programme in Eswatini.**							
Protocol version	**1.0**							
Nature of application	New		Amendment		Renewal	X	Extension	CT updates
List of study sites	University of Eswatini, Southern Africa Nazarene University, and Eswatini Medical Christian University							
Name of Principal Investigator	**Ms. Sithembile Siphiwe Shongwe**							
Names of Co- Investigators	Dr. Susan Jennifer Armstrong							
Names of steering committee members in the case of clinical trials	N/A							
Names of Data and Safety Committee members in the case of clinical trials	N/A							
Level of risk (Tick appropriate box)	Minimal		**More than minimal**		High			
	X							
Initial study Approval information	**Approved**	X	**Study completion date**	31/12/2023	**Certificate expiry Date**	09/09/2022		
	Approval date	09/09/2021						
Study renewal approval information	**Renewal date**	03/10/2022			**End date**	03/10/2023		
Study amendment approval information	**Amendment date**							
Study extension approval information	**Extension date**				End date			
Signature of Chairperson								
Signing date	**03/10/2022**							
Secretariat Contact Details	Name of contact officers		**Babazile Shongwe**					
	Email address		es@ehhrrb.org.sz					
	Telephone no.		**(00268) 2404 7751/9553**					

ESWATINI HEALTH & HUMAN RESEARCH REVIEW BOARD
03 OCT 2022
P.O BOX 5, MBABANE H100
TEL: (+268) 2404 7751
EHHRRB

ANNEXURE 4: PERMISSION TO COLLECT DATA

UNIVERSITY OF ESWATINI
FACULTY OF HEALTH SCIENCES

P.O. BOX 369, MBABANE H100, ESWATINI
Tel (-268) 4040171/2/4046242; Fax (-268) 4046241; Telex

E-mail: psdlamini@uniswa.sz

DEAN
Prof. P.S. Dlamini, SRN, (S.H.I.S), B.Ed. Nursing (Botswana), M. Cur. Nursing, Ph.D. Nursing (Natal)

15 June 2021

Ms. Sithembile S. Shongwe ,
P. O. Box 4150
MANZINI

Dear Madam

RE: REQUEST FOR PERMISSION TO CONDUCT A MAIN STUDY

Reference is made to your request to conduct a Thesis entitled '**A framework for integrating simulation into the Bachelor of Nursing Science programme in Eswatini'.**

I am pleased to inform you that your request is hereby granted with consideration that you provide the Department of Nursing with a copy of your Research Report.

Kindly liaise with Dr. S.V. Dlamini (76933553) or dlaminisv@uniswa.sz for assistance while collecting your data.

Yours sincerely

PROF. P. S. DLAMINI

cc: HOD – General NursingSciences.
Dr. S.V. Dlamini

ANNEXURE 5: PERMISSION TO COLLECT DATA

SOUTHERN AFRICA NAZARENE UNIVERSITY

ADMINISTRATION

P.O.Box 6800 Manzini M200, Kingdom of Swaziland
Tel (+268) 2505 5749 Fax: (+268) 2505 2539
Email: admin@sanu.ac.sz P.O.Box 6800 Manzini M200, Kingdom of Swaziland

SANU

16/09/2021

The Researcher
University of the Witwatersrand
Faculty of Health Sciences
Department of Nursing Education
Gauteng Province
South Africa

Dear Mrs. Sithembile Siphiwe Shongwe

Re: Authorization to Conduct a Research Study in the SANU-FOHS Premises

It is with pleasure to inform you that your request to conduct a research study titled: **"A Framework for Integrating Simulation into the Bachelor of Nursing Science Programme in Eswatini"** at Southern Africa Nazarene University (SANU) has been duly considered and permission is granted.

The University is kindly requesting the researcher to guarantee the following conditions which are in line with the ethical considerations that are expected from all researchers:

1. Ensure voluntary participation and safety of all the participants
2. Obtain written consent from each and every participant
3. Ensure anonymity where necessary during data collection
4. Confidentiality is strictly observed and that data is kept safe
5. That the university receives a copy of the report/findings on the proposed research study

Due to the prevailing COVID-19 pandemic, the university is requesting the researcher to take precautionary measures to minimize the spread of the virus, in accordance with the Kingdom of Eswatini COVID-19 National Guidelines.

All needed assistant and guidance during your data collection will be obtained through the dean of the faculty of health sciences and the university would like to wish you well as you pursue your studies.

Yours sincerely

Dr. B. T. Sibandze
Acting Pro-Vice Chancellor Academics
Cc : Acting Vice Chancellor
: Dean-Faculty of Health Sciences

ANNEXURE 6: PERMISSION TO COLLECT DATA

Eswatini Medical Christian University

P. O. Box A624 Swazi Plaza, Mbabane H101, Swaziland
E-mail:info@scu.ac.sz
Lomkiri Portion 69 of farm 73, Zone 4, Mbabane, Hhohho

15 September 2021

Dear Applicant

RE: PERMISSION TO CONDUCT A STUDY IN THE CLINICAL LABORATORY

Reference is made on the above captioned subject.

We appreciate your interest in doing the study entitled **'A Framework for Integrating Simulation into the Bachelor of Nursing Science Programme in Eswatini.'**

After going through the protocol approval documents, we are pleased to approve your request to conduct this study in our Institution. We advise that you kindly furnish us with your findings upon completion of the proposed study.

Contact the undersigned for any queries.

Yours sincerely,

SWAZILAND CHRISTIAN UNIVERSITY
DEAN
FACULTY OF HEALTH SCIENCES
P.O. BOX A624, SWAZI PLAZA MBABANE
TEL: (+268) 2472 8157 FAX: (+268) 2472 8057

M.P. Msibi

Dean: Health Sciences

Eswatini Medical Christian University, formerly Swaziland Christian University

Tel:(+268) 24728157, Cell:(+268) 76787648/ 79478005

profmlungi@emcu.ac.sz / profmlungi@gmail.com. University E-mail: info@scu.ac.sz . Web: http://emcu.ac.sz/skype Id: profmlu

ANNEXURE 7: INTRODUCTION TO RESEARCH ETHICS AND GOOD CLINICAL PRACTICE CERTIFICATES



Zertifikat
Certificat
Certificado
Certificate

TRREE

Promouvoir les plus hauts standards éthiques dans la protection des participants à la recherche biomédicale
Promoting the highest ethical standards in the protection of biomedical research participants

Clinical Trials Centre
The University of Hong Kong

Certificat de formation - Training Certificate

Ce document atteste que - this document certifies that

Sithembile Siphiwe Shongwe

a complété avec succès - has successfully completed

Introduction to Research Ethics

du programme de formation TRREE en évaluation éthique de la recherche
of the TRREE training programme in research ethics evaluation

Release Date: 2021/02/11

CID : CIHUpEZZIe

Professeur Dominique Sprumont
Coordinateur TRREE Coordinator

FMH Continuing Education Program (5 Credits) Programme de Formation continue (5 Crédits)

Foederatio Pharmaceutica Helvetiae FPH Programmes de formation continue Continuing Education Programs Programmes de formation continue

Ce programme est soutenu par - This program is supported by :
European and Developing Countries Clinical Trials Partnership (EDCTP) (www.edctp.org) - Swiss National Science Foundation (www.snf.ch) - Canadian Institutes of Health Research (http://www.cihr-irsc.gc.ca/e/2891.html) - Swiss Academy of Medical Science (SAMS/ASSM/SAMW) (www.samw.ch) - Commission for Research Partnerships with Developing Countries (www.kfpe.ch)

[REV : 20170310]



Zertifikat
Certificat
Certificado
Certificate

TRREE

Promouvoir les plus hauts standards éthiques dans la protection des participants à la recherche biomédicale
Promoting the highest ethical standards in the protection of biomedical research participants

Clinical Trials Centre
The University of Hong Kong

Certificat de formation - Training Certificate

Ce document atteste que - this document certifies that

Sithembile Siphiwe Shongwe

a complété avec succès - has successfully completed

Good Clinical Practice (GCP-E6(R2) 2016)

du programme de formation TRREE en évaluation éthique de la recherche
of the TRREE training programme in research ethics evaluation

Release Date: 2021/06/02

UCID : bEaTfGutOW

Professeur Dominique Sprumont
Coordinateur TRREE Coordinator

FMH Continuing Education Program (5 Credits) Programme de Formation continue (5 Crédits)

Foederatio Pharmaceutica Helvetiae FPH Programmes de formation continue Continuing Education Programs Programmes de formation continue

Ce programme est soutenu par - This program is supported by :
European and Developing Countries Clinical Trials Partnership (EDCTP) (www.edctp.org) - Swiss National Science Foundation (www.snf.ch) - Canadian Institutes of Health Research (http://www.cihr-irsc.gc.ca/e/2891.html) - Swiss Academy of Medical Science (SAMS/ASSM/SAMW) (www.samw.ch) - Commission for Research Partnerships with Developing Countries (www.kfpe.ch)

[REV : 20181124SL]

ANNEXURE 8: INVITATION TO PARTICIPATE IN A SURVEY STUDY

Study title: A Framework for Integrating Simulation into the Bachelor of Nursing Science Programme In Eswatini.

Good day; my name is **Sithembile Siphiwe Shongwe**. I am a PhD student in the Department of Nursing Education at the University of Witwatersrand. I will be conducting the research entitled: "A framework for integrating simulation into the Bachelor of Nursing Science programme in Eswatini." I will undertake this mixed methods study under Dr Susan Armstrong's supervision, a specialist in nursing education in the Department of Nursing Education, and Dr Catherine H. Thurling, simulation coordinator at the Centre for Health Science Education (CHSE) department at the University of the Witwatersrand. This study's need is driven by evidence showing that simulation is an effective teaching strategy for developing practice-ready nursing professionals.

The study aims to develop a framework for integrating simulation into the Bachelor of Nursing Science (BN Sc) programme in Eswatini. The framework will provide a guide about using simulation-based teaching techniques, thus promoting the timely acquisition of the expected nursing knowledge, attitudes and skills for professional practice.

I would like to invite you to take part in a survey study to assess the current state of simulation-based education in the educational preparation of the BN Sc Students in Eswatini. Your input will help me establish priority needs concerning simulation-based education in preparing the BN Sc students in Eswatini. Furthermore, the information will be used to inform the development of a simulation framework that will enable nurse educators to incorporate simulation into the nursing programme.

The survey study will include nurse educators (lecturers) who teach the BN Sc Students from all three Universities of Eswatini. A self-administered survey questionnaire will be used to collect the data. The survey is anticipated to take place at the beginning of June 2021. It should take approximately 10 to 15 minutes to complete the questionnaire. It will be hand-delivered to you by the researcher, and you are kindly requested to complete the questionnaire within ten (10) working days to enable the research to progress according to the schedule.

There are no foreseeable risks associated with participating in the study. All information that will be shared will not be used to harm you or your institution's reputation. Also, kindly note that there will be no personal benefits for participating in the study. However, the study outcomes will be used to advance nursing education clinical teaching and learning delivery in the Bachelor of Nursing Science programme.

The information you share in this study will be kept strictly confidential. Access will be limited to the researcher and the supervisors. Any form of identification will be replaced with codes to ensure that the shared information cannot be linked with you or your institution. All data will be stored securely in the university's Department of Nursing Education for a minimum of two years after publication or six years in the absence of publication. Your participation in this study is entirely voluntary; you may withdraw your participation from the study at any time without any prejudice or negative consequences.

Should you have any questions or concerns about any aspects of this study, please call me, Sithembile Shongwe (researcher), at (+268) 76058341 or e-mail sithegwebu@gmail.com. You can also contact my supervisor, Dr Susan J. Armstrong, at Sue.armstrong@wits.ac.za or via phone at (+27) 11 717 1234; Dr Catherine H. Thurling Hilary.Thurling@wits.ac.za or via telephone: +27 11 717 2548.

In case you have any concerns over the way the study is being conducted, please contact:

The Chairperson of the University of the Witwatersrand Ethics Committee, Professor Clement Penny, may be contacted on the telephone at 011 717 2301 or by e-mail: Clement.Penny@wits.ac.za. The telephone numbers for the Committee secretariat are 011 717 2700/1234. The names and e-mail addresses of the secretaries are Zanele Ndlovu Zanele.Ndlovu@wits.ac.za and Rulani Mukansi: Rhulani.Mukansi@wits.ac.za.

The Eswatini Health and Human Research Review Board may be contacted by telephone at (00268) 2404 7751/6039 or by e-mail at ehhrrbeswatini@gmail.com. Please feel free to contact them during working hours and days.

Thank you.

Sithembile S. Shongwe, PhD Student

ANNEXURE 9: INVITATION TO PARTICIPATE IN THE AUDITING OF A SIMULATION CENTRE/CLINICAL LABORATORY

Study title: A Framework for Integrating Simulation into the Bachelor of Nursing Science Programme In Eswatini.

Good day; my name is Sithembile Siphiwe Shongwe. I am a PhD student in the Department of Nursing Education at the University of Witwatersrand. I will be conducting research entitled: "A Framework for Integrating Simulation into the Bachelor of Nursing Science programme in Eswatini." I will undertake this mixed methods study under Dr Susan J. Armstrong's supervision, a nursing education specialist in the Department of Nursing Education, and Dr Catherine H. Thurling, simulation coordinator at the Centre for Health Science Education (CHSE) department at the University of the Witwatersrand. This study's need is driven by evidence showing that simulation is an effective teaching strategy for developing practice-ready nursing professionals.

This study aims to develop a framework for integrating simulation into the Bachelor of Nursing Science (BN Sc) programme in Eswatini. The framework will provide a guide about using simulation-based teaching techniques, thus promoting the timely acquisition of the expected nursing knowledge, attitudes and skills for professional practice.

I would like to invite you to take part in the process of auditing your institution's simulation centre/clinical laboratory to assess the state of simulation use. The auditing will help assess the type of available resources for facilitating simulation use in your institution. The findings will be used to inform the development of a suitable framework for integrating simulation into the Eswatini Bachelor of Nursing Science Programme.

The auditing will be done by the researcher using a checklist to assess the learning environment. The audit tool will contain information that seeks to establish nurse educators' knowledge and experiences about simulation use and the identification of physical resources for supporting the operation of the simulation centre/clinical laboratory. Your role is to facilitate or assist the researcher in gathering this information about your simulation centre/clinical laboratory. This activity will last for approximately 45 to 60 minutes.

There are no foreseeable risks associated with participating in the study. All the information gathered will not be used to harm you or your institution's reputation. It will strictly be used to answer the research question. Also, kindly note that there will be no personal benefits for participating in the study. However, the study outcomes will be used to advance nursing education clinical teaching and learning delivery in the Bachelor of Nursing Science programme.

The information you share in this study will be kept strictly confidential. Access will be limited to the researcher and the supervisors. Any form of identification will be replaced with codes to ensure the shared information cannot be linked with you or your institution. All data will be stored securely in the Department of Nursing Education in the university for a minimum of two years after publication or six years in the absence of publication.

Your participation in this study is entirely voluntary; you may withdraw your participation from the study at any time without any prejudice or negative consequences.

Should you have any questions or concerns about any aspects of this study, please call me, Sithembile Shongwe (researcher), at (+268) 76058341 or e-mail sithegwebu@gmail.com. You can also contact my supervisor, Dr Susan J. Armstrong, at Sue.armstrong@wits.ac.za or via phone at (+27) 11 717 1234; Dr Catherine H. Thurling Hilary.Thurling@wits.ac.za or via telephone: +27 11 717 2548.

In case you have concerns over the way the study is being conducted, please contact:

The Chairperson of the University of the Witwatersrand Ethics Committee, Professor Clement Penny, may be contacted on the telephone at 011 717 2301 or by e-mail: Clement.Penny@wits.ac.za. The telephone numbers for the Committee secretariat are 011 717 2700/1234. The names and e-mail addresses of the secretaries are Zanele Ndlovu Zanele.Ndlovu@wits.ac.za and Rulani Mukansi: Rhulani.Mukansi@wits.ac.za.

The Eswatini Health and Human Research Review Board may be contacted by telephone at (00268) 2404 7751/6039 or by e-mail at ehhrrbeswatini@gmail.com. Please feel free to contact them during working hours and days.

Thank you.

Sithembile S. Shongwe, PhD Student

ANNEXURE 10: INVITATION TO PARTICIPATE IN AN ITERATIVE REVIEW STUDY

Study title: A Framework for Integrating Simulation into the Bachelor of Nursing Science Programme In Eswatini.

Good day; my name is **Sithembile Siphiwe Shongwe**. I am a PhD student in the Department of Nursing Education at the University of Witwatersrand. I will be conducting research entitled: "A Framework for Integrating Simulation into the Bachelor of Nursing Science programme in Eswatini." I will undertake a four-phased mixed methods study under the supervision of Dr Susan J. Armstrong, a specialist in nursing education in the Department of Nursing Education, along with Dr Catherine H. Thurling, simulation coordinator at the Centre for Health Science Education (CHSE) department, at the University of the Witwatersrand. This study's need is driven by evidence showing that simulation is an effective teaching strategy for developing practice-ready nursing professionals.

I would like to invite you to take part in this study. The study aims to develop a framework for integrating simulation into the Bachelor of Nursing Science (BN Sc) programme in Eswatini. The framework will provide a guide about using simulation-based teaching techniques, thus promoting the timely acquisition of the expected nursing knowledge, attitudes and skills for professional practice.

You are invited to participate because of your expertise in simulation use in nursing education in the Southern Africa Region. You are kindly requested to participate in a nominal group discussion that will be tape-recorded. The data will be collected using an interview schedule. The tool's content will be informed by information derived from previous phases of this study (scoping review and a survey study). The researcher will meet you once to collect the data. The researcher will present question statements you are requested to review to help identify priority components suitable for developing the simulation framework. In the development process, you will be guided by Jeffries Simulation Theory model.

There are no foreseeable risks associated with participating in the study. All information shared will not be used to harm you or your institution's reputation. Also, kindly note that there will be no personal benefits for participating in the study. However, the study outcomes

will be used to advance nursing education clinical teaching and learning delivery in the Bachelor of Nursing Science programme.

Although confidentiality and anonymity will not be possible to ensure during the group discussion, data shared in this study will strictly be kept confidential. Codes instead of your identifiers will be used when quoting the information you shared in the project or publications. Access will be limited to the researcher and the supervisors. Any form of identification will be replaced with codes for information quoted in the final thesis document and publications. All data will be stored securely in the University Department of Nursing Education at least two years after publication or six years in the absence of publication. Your participation in this study is entirely voluntary; you may withdraw your participation from the study at any time without any prejudice or negative consequences.

Should you have any questions or concerns about any aspects of this study, please call me, Sithembile Shongwe (researcher), at (+268) 76058341 or e-mail thetwin.sithembile@gmail.com. You can also contact my supervisor, Dr Susan J. Armstrong, by e-mail: Sue.armstrong@wits.ac.za or by phone at (+27) 11 717 1234; Dr Catherine H. Thurling by e-mail: Hilary.Thurling@wits.ac.za or via telephone: +27 11 717 2548.

In case you have any concerns over the way the study is being conducted, please contact:

The Chairperson of the University of the Witwatersrand Ethics Committee is Professor Clement Penny, who may be contacted on the telephone at 011 717 2301 or by email: Clement.Penny@wits.ac.za. The telephone numbers for the Committee secretariat are 011 717 2700/1234. The names and e-mail addresses of the secretaries are Zanele Ndlovu Zanele.Ndlovu@wits.ac.za and Rulani Mukansi: Rhulani.Mukansi@wits.ac.za.

The Eswatini Health and Human Research Review Board may be contacted by telephone at (00268) 2404 7751/6039 or by e-mail at ehhrrbeswatini@gmail.com. Please feel free to contact them during working hours and days.

Thank you

Sithembile S. Shongwe, PhD Student

ANNEXURE 11: AN INVITATION TO PARTICIPATE IN A DELPHI STUDY

Study title: A Framework for Integrating Simulation into the Bachelor of Nursing Science Programme In Eswatini.

Good day; my name is **Sithembile Siphiwe Shongwe**. I am a PhD student in the Department of Nursing Education at the University of Witwatersrand. I will be conducting research entitled: "A Framework for Integrating Simulation into the Bachelor of Nursing Science programme in Eswatini." I will undertake this four-phased mixed methods study under the supervision of Dr Susan J. Armstrong, a specialist in nursing education in the Department of Nursing Education, along with Dr Catherine H. Thurling, simulation coordinator at the Centre for Health Science Education (CHSE) department, at the University of the Witwatersrand. This study's need is driven by evidence showing that simulation is an effective teaching strategy for developing practice-ready nursing professionals.

I would like to invite you to take part in a Delphi study. The study aims to develop a framework for integrating simulation into the Bachelor of Nursing Science (BN Sc) students in Eswatini. The framework will provide a guide about using simulation-based teaching techniques, thus promoting the timely acquisition of the expected nursing knowledge, attitudes and skills for professional practice.

You are invited to evaluate the simulation draft framework's clinical utility because you are a key stakeholder in nursing practice and education in Eswatini. The simulation draft framework will be developed in the third phase of this study by simulation experts from the Southern Africa Region and an international expert. The researcher will hand-deliver a self-administered questionnaire. The tool consists of structured questions and spaces for further elaboration. Please feel free to submit your expert opinions. It is anticipated that Delphi will have two rounds. However, if a consensus of 80% or more is not reached in the second round, third or subsequent rounds will be considered. Subsequent questionnaires will be informed by results derived from the initial round of this process and shared with the results from the previous round. The questionnaire should take approximately 20 to 30 minutes to complete. Furthermore, you are kindly requested to complete the questionnaire within ten (10) working days to enable the study to progress according to the schedule.

There are no foreseeable risks associated with participating in the study. All information shared will not be used to harm you or your institution's reputation. Also, kindly note that there will be no personal benefits for participating in the study. However, the study outcomes will be used to advance nursing education clinical teaching and learning delivery in the Bachelor of Nursing Science programme.

The information you share in this study will be kept strictly confidential. Access will be limited to the researcher and the supervisors. Any form of identification will be replaced with codes to ensure that the shared information cannot be linked with you or your institution. All data will be stored securely in the university's Department of Nursing Education for a minimum of two years after publication or six years in the absence of publication.

Your participation in this study is entirely voluntary; you may withdraw your participation from the study at any time without any prejudice or negative consequences.

Should you have any questions or concerns about any aspects of this study, please call me, Sithembile Shongwe (researcher), at (+268) 76058341 or e-mail thetwin.sithembile@gmail.com. You can also contact my supervisors, Dr Susan J. Armstrong, at Sue.armstrong@wits.ac.za or via phone at (+27) 11 717 1234; Dr Catherine H. Thurling Hilary.Thurling@wits.ac.za or via telephone: +27 11 717 2548.

In case you have any concerns over the way the study is being conducted, please contact:

The Chairperson of the University of the Witwatersrand Ethics Committee is Professor Clement Penny, who may be contacted on the telephone at 011 717 2301 or by e-mail at Clement.Penny@wits.ac.za. The telephone numbers for the Committee secretariat are 011 717 2700/1234. The names and e-mail addresses of the secretaries are Zanele Ndlovu Zanele.Ndlovu@wits.ac.za and Rulani Mukansi: Rhulani.Mukansi@wits.ac.za.

The Eswatini Health and Human Research Review Board may be contacted by telephone at (00268) 2404 7751/6039 or by e-mail at ehhrrbeswatini@gmail.com. Please feel free to contact them during working hours and days.

Thank you

Sithembile S. Shongwe, PhD Student

ANNEXURE 12: CONSENT FORM

I _____, confirm that I have been given a Participant Information Sheet which explains the nature and processes involved in this study, entitled “A Framework for Integrating Simulation into the Bachelor of Nursing Science programme in Eswatini.”

I was given time to read the information sheet in my best-understood language. I was given time to ask any questions I wanted to and found any answers given to me reasonable and satisfactory. I believe I fully understand why the study is being conducted and what the intended outcomes will be. I understand that there will be no immediate benefit to me should I agree to participate, nor will I receive any payment; conversely, participation will not cost me anything but my time.

I understand that, even if I initially consent to take part in the study, I may subsequently withdraw at any time and would not be required to give any reasons; if that happened, any data collected about me for the purposes of the study would immediately be destroyed, unless I give consent for it to be retained.

I have been given a range of contact details listed below. If I require further information or become concerned about any aspect of this study, I am free to speak to any of these contacts.

Contact details:

Sithembile Siphiwe Shongwe Principal Investigator, telephone no. (00268) 76058341 or by e-mail at 1044231@students.wits.ac.za,

Dr Susan J. Armstrong, Supervisor, telephone no: (+27) 11 717 1234 or e-mail at Sue.armstrong@wits.ac.za or Dr Catherine H. Thurling, Supervisor, telephone no: +27 11 717 2548 or e-mail at Hilary.Thurling@wits.ac.za.

Professor CB Penny, Chairperson of the Human Research Ethics Committee (Medical) at the University of Witwatersrand, on telephone no. 011 717 2301, or by e-mail at Clement.Penny@wits.ac.za.

Ms Z Ndlovu or Mr Rhulani Mkansi, Committee Secretariat, telephone nos.: 011 717 2700 or 1234, or by e-mail at: Zanele.Ndlovu@wits.ac.za or Rhulani.Mkansi@wits.ac.za

Name of Participant: _____ Date:

_____

Place: _____

Signature or mark: _____

ANNEXURE 13: CONSENT FORM FOR AUDIO RECORDING OF INTERVIEWS

I _____, hereby consent to an audio recording of the interview for this study, entitled: “A Framework for Integrating Simulation into the Bachelor of Nursing Science programme in Eswatini”.

I understand that:

- The recording will be stored in a secure location (a locked cupboard or password-protected computer) with restricted access to the researcher and the research supervisor.
- The recording will be transcribed, and any information that could identify me will be removed.
- The recordings will be erased within either (a) two (2) years of the publication of the research findings or (b) six (6) years if no publications arise from this research.
- Anyone wishing to access this information in the future will first have to obtain the approval of the Human Research Ethics Committee (Medical) of the University of the Witwatersrand, Johannesburg.
- Without any information that could identify me, direct quotes from my interview may be cited in the research report or other research write-ups.

Name of Participant: _____

Date: _____

Place: _____

Signature or mark: _____

ANNEXURE 14: SCOPING REVIEW DATA EXTRACTION INSTRUMENT

1. Author(s)
2. Title
3. Year of publication
4. Publisher
5. Study setting
6. Study purpose/objective
7. Study population group and sample size
8. Research Methodology
9. Findings/results

The elements were sourced from (Peters, Godfrey, Mclnerney, *et al.*, 2015; Peters *et al.*, 2020, 2021).

ANNEXURE 15: SURVEY A–SIMULATION CENTRES/ CLINICAL LABORATORIES AUDITING TOOL

ELEMENT A: INSTRUCTOR / STAFF NEEDS Standard: The simulation centre has a team of trainers who clearly understand their tasks and objectives.				
Criteria	**Yes**	**Partially**	**No**	**N/A**
An academic staff member is designated as the simulation centre/activities coordinator.				
A lecturer/student ratio has been determined for simulation sessions.				
A simulation technician is available at the simulation centre.				
Secretarial support is available to the academics using the centre.				
Educators have been trained in the following aspects of simulation use:	**All**	**Most**	**Some**	**None**
• planning a simulation				
• implementing a scenario (including briefing, action, and debriefing)				
• evaluating a simulation using a recognised instrument.				
• writing scenarios				
• developing assessment tools for student assessment, e.g. checklists				
• applicable regulations, guidelines, and local protocols				
• preparing simulation equipment for training				
• management of equipment after the training session				
• Integrating simulation into the curriculum				
• The use and preparation of standardised patients				
• The use of computerised mannikins				
• The use of non-computerised mannikins				
• The use of task trainers				
• The use of high-fidelity equipment				
• The use of medium-fidelity equipment				
• Debriefing of students after a simulation exercise				

ELEMENT B: FINANCIAL AND RESOURCE PLANNING Standard: Financial and resource plans ensure the sustainability of the simulation centre				
Criteria	**Yes**	**Partially**	**No**	**N/A**

One-time costs/investments made or planned for include financing of:				
Allocation or building premises required for the operation of a Simulation Centre				
Purchasing of manikins and other simulation equipment				
Purchasing or allocating appropriate furniture, such as hospital beds, cabinets, tables, chairs, etc.;				

Purchasing or allocating video/audio, computer, and office equipment (e.g. multimedia projector, screen, speakers, video cameras, printer, etc.)				
Purchasing or allocating additional software required for simulation scenarios.				
Purchasing or allocating money to support the initial training of trainers and other personnel (travel, tuition fees, salaries for the training period, etc.)				
Recurrent costs/investments made or planned for include the financing of:				
Salaries for trainers and assisting personnel (reimbursing for the time spent on training)				
Purchase of consumable materials for simulation-based learning				
Purchase of paper and toner (or cartridge) for printing/copying handouts and other materials provided to trainees				
Travel costs for trainees from remote areas				
Accommodation for trainees from remote areas (when staying overnight)				
Equipment maintenance, repairs (including the cost of labour and spare parts), and depreciation;				
Utility bills (electricity, heating, water, etc.); Expenses related to further training, education,				
Skill advancement for personnel (travel expenses for attending courses, workshops, conferences; tuition or registration fees; other related expenses).				
Membership of a recognised Simulation in the Healthcare Society				
ELEMENT C: INFRASTRUCTURE AND EQUIPMENT Standard: Available or planned infrastructure and equipment for the simulation centre support successful simulation learning.				
Criteria	**Yes**	**Partially**	**No**	**N/A**
The simulation centre or the structure planned as a simulation centre has the following:				
An autonomous entrance				

There is minimal contact between the simulation team and patients in the clinical environment (when the simulation centre is part of a healthcare facility).				
At least one simulation (training) room (size ≥ 30 sq m)				
One observation room (technical / computer)				
The meeting room (debriefing room) is separated from the simulation room by a big glass window.				
A room for preparation of standardised patients and rest between simulation				
A debriefing room				
A storage room				
A toilet/washroom				
General infrastructure in the simulation centre includes the following:				
A water supply				
An oxygen supply				
Air				
A suction system				
Adequate lighting				
Electrical outlets				
Training equipment includes the following:				
Simulation equipment:				
• Obstetric/midwifery mannikins (state number)				
• Critical care mannikins (state number)				
• monitors (State number)				
• software for clinical scenario simulation				
Clinical equipment:	**Yes**	**Some**	**No**	**N/A**
Beds				
Simulated medicines (can be expired drugs)				
Monitoring equipment (pulse oximeter, blood pressure device, ECG				
Ambu bag with a mask for adults, children, and newborn				
Endotracheal tubes of all sizes				
Oral Pharyngeal airway (for adults and newborns)				
Nasal cannulae for CPAP therapy (positive pressure during exhalation)				
Nasal cannulae for oxygen therapy				
Obstetrical equipment (vacuum extractor, obstetric forceps, set of vaginal specula)				
Defibrillator				
Surgical equipment for suturing				
Boxes with a set of medicines and supplies for emergency care in such conditions				

Medical (disposable) gowns, masks				
Sterile and disposable rubber gloves				
Box with sterile material (sterile compresses, etc.)				
Catheters for aspiration of newborns (F10,12,14)				
Urinary catheters				
Stethoscope				
Foetal stethoscope				
Hand sanitiser				
IV catheters for adults - 20 G, 18G, 16G, for newborns, 24G, 22G				
Infusion systems, infusion solutions (NaCl 0.9%)				
Adhesive plaster				
Tourniquet				
Technical equipment				
Video system				
Audio system				
System for recording and broadcasting				

ANNEXURE 16: REQUEST FOR PERMISSION AND APPROVAL TO USE THE SCORS INSTRUMENT

Request for using the SCORS data collection Instrument

Sithembile Shongwe 1044231@students.wits.ac.za

to foisydc

Dear Dr Foisy-Doll

My name is Sithembile Siphiwe Shongwe. I am a PhD student at the University of the Witwatersrand in South Africa. I am requesting to use the: “Simulation Culture Organizational Readiness Survey (SCORS)” instrument and the guidebook to assess Eswatini nursing education institutions' readiness to integrate simulation into the curriculum for the preparation of Bachelor of Nursing Science students. The tool will strictly be used to gather data to address the abovementioned purpose.

The thesis is entitled: "A Framework for Integration of Simulation into the Bachelor of Nursing Science programme in Eswatini**."** It is at the proposal stage. Your assistance will be highly appreciated, as permission will be required when seeking Ethics approval. I will be happy to share the findings obtained from using the instrument if that can assist you in any way. With thanks and appreciation Sithembile



Colette Foisy-Doll to Kim, me

Dear Ms Shongwe,

Dr Kim Leighton and I are co-authors of the tool and are pleased to grant you permission to use the SCORS in your PhD study. We wish you all the very best and would be very interested in learning about what you learn. You will find the recommended citation on the tool.

Stay safe and well,

Colette Foisy-Doll RN MSN CHSE ANEF

--

This message was sent from my iPhone. Please forgive any typos.

ANNEXURE 17: SURVEY B INSTRUMENT

A FRAMEWORK FOR INTEGRATING SIMULATION INTO THE BACHELOR OF NURSING SCIENCE PROGRAMME IN ESWATINI

PART A: Sociodemographic Data:

Instruction: Please indicate your answer with a cross(x) inside the provided box or indicate your response with a coloured highlighter.

A. What is your sex?

1. Female ☐ 2. Male ☑ 3. Other: ……

B. What is your age range?

1. 26-30 years ☐ 2. 31-35 years ■ 3. 36-40 years ☐

4. 41-45 years ☐ ☐ 5. 46-50 years ☐ 6. 51-55 years ☐ ☐

7. 56-60 years 8. 61+ years

C. Indicate the number of years as a nurse educator/lecturer.

1. 1-4 years ☐ 2. 5-9 years ☐ 3.10-14 years

4. 15-19 ☐ years 5. 20+ ☐

D. What is your highest level of qualification?

1. Doctorate ■ 2. Master's degree ☐ 3. Bachelor's degree ☐

E. Do you teach a nursing course that has a practical component?

1. Yes ■ 2.No ☐

F. How were you trained to provide simulation-based education (use of demonstrations or role-plays to teach clinical/practical skills)?

1. In-service ☐ training 2. Peer-peer (experience sharing) ☐ 3. ☐ Workshop

4. Conferences ☐ 5 Literature Search ☐ 6. Self-trained ☐

7. Certified as a Healthcare Simulation Educator (CHSE) ☐ 8. Never trained ☐

7. Other: specify: ……..

G. What type of institution do you currently work in?

1. Public ☐ 2. Private ☐

3. Other, specify……..

PART B: Main Study Questions

In this part, you are required to respond by indicating with a cross (X) the extent to which your institution has integrated the following aspect of simulation

SECTION A: Defined Need and Support for Change		**None at All (1)**	**A Little (2)**	**Somewhat (3)**	**Moderately (4)**	**Very Much (5)**
1	To what extent are innovation, experiential learning, and quality student experiences clearly described as central to the mission and philosophy of your institution?					
2	To what extent has your organisation **clearly defined the need** to consider simulation--based education (SBE) integration?					
3	To what extent have administrators within your organisation communicated a **clear strategic vision** for SBE?					
4	To what extent have administrators within your organisation provided a **written commitment** to SBE?					
5	To what extent have administrators within your organisation provided **funding** to support the commitment to SBE?					
6	To what extent does your organisation promote **the need for SBE based on current evidence, standards, and guidelines?**					
7	To what extent is SBE currently being used as a **teaching modality in** your institution?					

8	To what extent have the educators you work with **articulated a need for SBE integration into the curriculum?**					
9	To what extent have the educators in your institution **verbalised a commitment to** SBE integration into the curriculum?					
Sub-section A Potential score						=45
SECTION B: Readiness for Culture Change		**None at All (1)**	**A Little (2)**	**Somewhat (3)**	**Moderately (4)**	**Very Much (5)**
10	**To what extent is there a critical mass of professionals who already possess strong SBE:**					
a.	Knowledge					
b.	Skills					
c.	Positive Attitudes					
11	To what extent do administrators **support culture change,** including the efforts required to implement and sustain SBE program integration?					
12	To what extent are there **credentialed or trained simulationists** who mentor/coach others, including other simulationists?					
13	To what extent does your organisation have **individuals who model SBE best practices?**					
14	To what extent are staff/faculty proficient in the **use of technology**? (I.e. computer systems, AV and IT systems)					
15	To what extent are there **graduate-level prepared researchers** available to assist in research to develop new knowledge, as appropriate to your organisation's mission?					
16	To what extent are **librarians available** within your organisation to help search for evidence-based practice and related simulation resources?					
17	To what extent are your **librarians accessed** to search for evidence-based practice and related simulation resources?					
18	To what extent do you believe that **now is the right time** to implement a culture change to support SBE?					
Sub-section B Potential score						**=55**

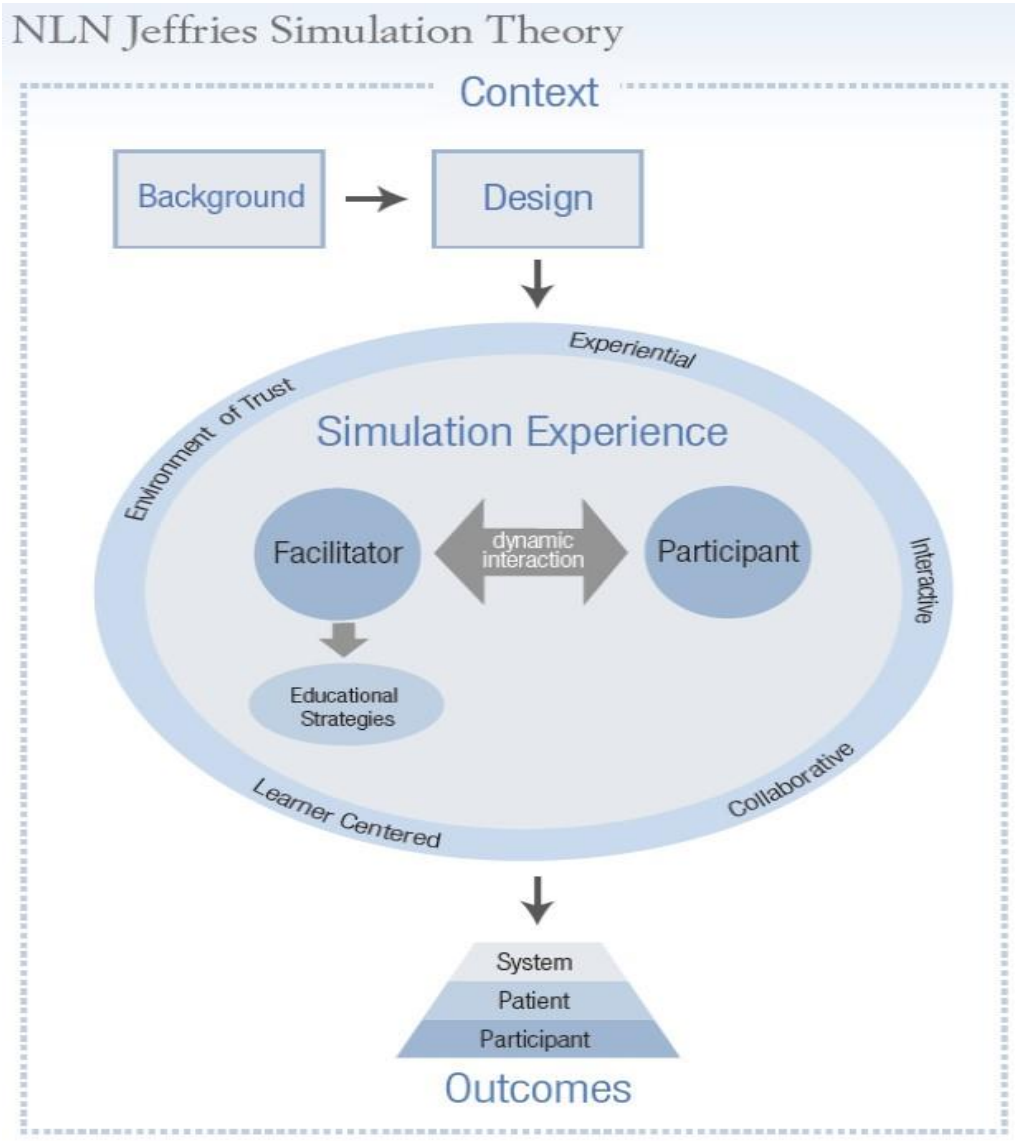
SECTION C: Time, Personnel, and Resource Readiness		**None at All (1)**	**A Little (2)**	**Somewhat (3)**	**Moderately (4)**	**Very Much (5)**
19	**To what extent are fiscal resources available to support SBE in the following areas:**					
a.	Human resources (simulation personnel)?					
b.	Education?					
c.	Release time to lead the integration of SBE?					
d.	Development of physical learning spaces?					
e.	Equipment?					
20	To what extent do employees in your institution have **access to quality technology,** including computers, audiovisual equipment, and other institutional technologies?					
21	To what extent is **support available** to learn and manage technologies that support education?					
22	**To what extent are there existing simulation champions (people who will go the extra mile to advance simulation) in the current environment among:**					
a.	Administrators?					
b.	Clinicians?					
c.	Educators?					
d.	Technology Specialists?					
e.	Administrative Assistants and Support Staff?					
Sub-section C Potential score						**=60**

SECTION D: Sustainability Practices to Embed Culture		**None at All (1)**	**A Little (2)**	**Somewhat (3)**	**Moderately (4)**	**Very Much (5)**
23	To what extent is the **measurement and sharing of outcomes** part of the culture of the organisation where you work?					
24	**To what extent are decisions regarding SBE influenced by**:					
a.	Clinicians?					
b.	Educators?					
c.	Administration?					

Sub-section D Potential score						**=20**

Sourced from (Foisy-Doll and Leighton, 2017a, 2017b)

ANNEXURE 18: NLN JEFFRIES SIMULATION THEORY MODEL-PHASE 3 STUDY TOOL



The image of the model was sourced from https://www.bing.com/images/search?view=detailV2&ccid=eiHHAjzy&id=186F26850854F179A64A9167D2DC358FF8E3BAEB&thid=OIP.

ANNEXURE 19: DELPHI STUDY QUESTIONNAIRE -ROUND ONE

RESEARCH TITLE: FRAMEWORK FOR INTEGRATING SIMULATION INTO THE BACHELOR OF NURSING SCIENCE PROGRAMME IN ESWATINI

SECTION A: SOCIO-DEMOGRAPHIC DATA:

Instruction: Please indicate your answer with a cross(x) in the provided box.

A. What is your age: _____?

B. How long have you been a nurse educator_____?

C. What is your speciality: _____?

D. What is your current position in the institution? Please tick/make a cross in the box:
   1. Head of Department ☐
   2. Senior lecturer ☐
   3. Lecturer
   4. Other, please specify: _____ _____ __.

Kindly share your email for rounds 2 and 3: _____

SECTION B: EVALUATION OF THE UTILITY OF THE FRAMEWORK

Description:

The tool is composed of five components (training or preparation of educators; integration of simulation into the midwifery programme; simulation equipment; simulation infrastructure; and student preparation for simulation-based education). In all the components, you are requested to determine the relevance and feasibility of the activity across three phases.

Instruction:

Indicate your answer with a cross (x) inside the corresponding box.

DOMAIN A—TRAINING OR PREPARATION OF EDUCATORS: to ensure that they are aware of the concept of simulation knowledge, implementation processes and principles.						
PHASE I — (FIRST 6 MONTHS)						
	Relevance: The degree to which the aspect is connected or useful to integrating simulation-based education into a programme.			**Feasibility:** The assessment of the practicality of the aspect to ensure the successful implementation of simulationbased education within the programme.		
Activity	**Agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
• Identify simulation champions and train them first on the principles and implementation of simulation-based education within an existing programme.						
• Identify the strengths of existing educators and train them according to their needs.						
Develop a training programme that would be accessible to all staff:						
—To learn how to develop students' objectives.						
— How to use simulation equipment and audio-visual devices.						
—Learn about simulation fidelity.						

– Learn about prebriefing students.						

– Learn about formulating, implementing and facilitating a simulation.						
– Developing clinical simulation scenarios.						
– How to facilitate a debriefing session, provide feedback to students and evaluate student performance						
Comment: (anything you partially agree/disagree with regarding the relevance and feasibility of the activity) _____ _____						
PHASE II: (7 MONTHS TO 2 YEARS)						
	Relevance:			**Feasibility:**		
Activity	**Agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
• Develop a simulation scenario template.						
• Identify and contextualise debriefing tools.						
• Develop evaluation instruments.						
• Support trained staff to implement simulation experiences using available resources.						
• Recruit and train standardised patients (SPs)						
• Institution to consider membership to a recognised simulation organisation, e.g., Society for Simulation in Healthcare, for support and educational resources.						
• Develop a simulation community to share best practices.						
Comment: (anything you partially agree/disagree with regarding the relevance and feasibility of the activity) _____ _____						

PHASE III: (3 TO 5 YEARS)		
	Relevance:	**Feasibility:**

Activity	**Agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
• Ensure ongoing faculty development and support of staff engaged in simulation.						
• Orient and train new staff members.						
• Faculty members should obtain formal training in simulation that leads to certification (certificate, diploma/degree).						

Comment: (anything you partially agree/disagree with regarding the relevance and feasibility of the activity)

_____

_____

DOMAIN B: INTEGRATION OF SIMULATION INTO THE MIDWIFERY PROGRAMME: Integrating simulation-based education into the programme indicates institutional readiness for culture change and ensures sustainability.

PHASE I - (FIRST 6 MONTHS)						
	Relevance:			**Feasibility:**		
Activity	**Agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
• The Midwifery Department should engage/collaborate with institutional management and relevant stakeholders regarding the process of integrating simulation into the programme to ensure the sustainability of simulation-based education and support for change).						
• Develop a mission and vision statement for simulation-based education integration that aligns with the parent institution.						
• Develop a strategic plan for simulation-based education that aligns with the programme's goals and institutional vision.						
• Establish a written commitment from management to support simulationbased education.						

• Establish institutional management plans in providing funding to support the commitment to simulation-based education.						
• Develop a business plan for the simulation programme to attract grants/funding.						
Comment: (anything you partially agree/disagree with regarding the relevance and feasibility of the activity)						

_____
_____

PHASE II: (7 MONTHS TO 2 YEARS)

	Relevance:			**Feasibility:**		
Activity	**Agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
• Select a subcommittee responsible for integrating simulation into the midwifery programme.						
• Review the existing curriculum to identify where simulation would enhance midwifery education.						
• Develop an integration plan and timelines.						
• Identify the goals of simulation in midwifery education.						
• Identify the midwives' competencies to be achieved through simulationbased education (e.g., normal birth practices, neonatal resuscitation, obstetric haemorrhage, sepsis, communication skills, and clinical assessments).						
• Develop guidelines, protocols, policies and procedures for guiding simulation learning.						
• Select a small multidisciplinary team (course lecturer, one/two other lecturers, a clinical instructor, a clinician, simulation experts/champions, and researchers) to assist in developing clinical simulation scenarios for teaching midwifery skills.						
• Develop the evaluation tools (standard checklist to assess student performance).						

• Implement the simulation-based education programme.						

Comment: (anything you partially agree/disagree with regarding the relevance and feasibility of the activity)

_____

_____

PHASE III: (3 TO 5 YEARS)

	Relevance:			Feasibility:		
Activity	**Agree**	**Partially Agree**	**Disagree**	**Agree**	**Partially Agree**	**Disagree**
• Review and adjust integrating plans along with timelines.						
• Review the midwifery simulation programme (evaluation of the programme's status in achieving the educational goals and uptake).						
• Plans to integrate simulation into other departments or the entire Bachelor of Nursing curriculum should be initiated.						

Comment: (anything you partially agree/disagree with regarding the relevance and feasibility of the activity)

_____

_____

DOMAIN C — SIMULATION EQUIPMENT: educational resources that would be used to develop the student competencies in readiness for clinical practice.

PHASE I — (FIRST 6 MONTHS)

	Relevance:			Feasibility:		
Activity	**Agree**	**Partially Agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
• Conduct a needs assessment of the available equipment to identify the type, quality, quantity, and functional status.						
• List the equipment required to meet the programme goals to avoid buying unnecessary equipment.						

• Benchmark with other regional institutions on the type of equipment that can assist in achieving the programme goals (level of skills and intended competencies).						
Prepare a budget plan for procuring equipment needed to create a realistic clinical simulation learning environment (short and long-term equipment purchasing plans) for the following:						
– Mannequins: prioritise buying low-cost mannequins; Mama Natalia and Neo Natalia at this phase if there are financial constraints.						
– Room furnishings (e.g., beds, carts, monitors, medical instruments)						
– Technological devices, audio-visual systems						
Comment: (anything you partially agree/disagree with regarding the relevance and feasibility of the activity)						

_____
_____
_____

PHASE II: (7 MONTHS TO 2 YEARS)						
	Relevance:			**Feasibility:**		
Activity	**Agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
• Implement the equipment purchase plan based on the curricular needs of the programme.						
• Orient staff on how to use the simulation equipment to ensure readiness to implement the simulation learning within the programme.						
• Ensure that funds are allocated for equipment maintenance, repairs, and depreciation.						
Comment: (anything you partially agree/disagree with regarding the relevance and feasibility of the activity)						
PHASE III: (3 TO 5 YEARS)						

	Relevance:			Feasibility:		
Activity	**agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
• Consider purchasing additional simulation equipment in relation to the number of students in the programme.						
• High-fidelity mannequins (full-scale body mannequins) can be procured at this phase, depending on the programme learning goals.						
Comment: (anything you partially agree/disagree with regarding the relevance and feasibility of the activity) _____ _____						
DOMAIN D: INFRASTRUCTURE: simulation-based education occurs within a physical building, the learning environment/space.						
PHASE I — (FIRST 6 MONTHS)						
	Relevance:			**Feasibility:**		
Activity	**Agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
• Assess the existing simulation laboratory physical infrastructure to identify what is available and missing.						
• The department should benchmark for a simulation laboratory/centre infrastructure plan/design or buy an existing simulation centre plan to build the simulation learning environment.						
• The department should allocate the premises for building the simulation laboratory or renovating/redesigning an existing structure.						
The department should have a physical building with the following structures/rooms:	**Agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
– Observation room						
– Debriefing room						
– Storage room						
– Technical room						

Comment: (anything you partially agree/disagree with regarding the relevance and feasibility of the activity)

_____

_____

PHASE II: (7 MONTHS TO 2 YEARS)						
	Relevance:			**Feasibility:**		
Activity	**Agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
• Apply for funding/grants for building the simulation laboratory.						
• Effect plans for redesigning the existing simulation laboratory infrastructure.						

Comment: (anything you partially agree/disagree with regarding the relevance and feasibility of the activity)

_____

_____

PHASE III: (3 TO 5 YEARS)		
	Relevance:	**Feasibility:**

Activity	**Agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
• Build the simulation learning space for the programme.						

Comment: (anything you partially agree/disagree with regarding the relevance and feasibility of the activity)

_____

_____

DOMAIN E: STUDENT/SIMULATION PARTICIPANTS: students are key stakeholders; they should be clear about their roles in simulation learning.

PHASE I (FIRST 6 MONTHS)		
	Relevance:	**Feasibility:**

Activity	Agree	Partially agree	Disagree	Agree	Partially agree	Disagree
• Conduct needs assessment to establish students' attributes and simulation expectations.						
• Develop contractual confidentiality documents to be signed by students before engaging in simulation learning.						
Comment: (anything you partially agree/disagree with regarding the relevance and feasibility of the activity) _____ _____						
PHASE II: (7 MONTHS TO 2 YEARS)						
	Relevance:			**Feasibility:**		
Activity	**Agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
• Introduce students to the formal simulation learning process (prebriefing and debriefing).						
• Pilot test simulation scenarios before engaging students in the learning process.						
• Conduct pre and post-tests to evaluate the simulation programme.						
Comment: (anything you partially agree/disagree with regarding the relevance and feasibility of the activity) _____ _____						
PHASE III: (3 TO 5 YEARS)						
	Relevance:			**Feasibility:**		
Activity	**Agree**	**Partially agree**	**Disagree**	**Agree**	**Partially agree**	**Disagree**
• Evaluate the simulation programme in relation to meeting students' needs.						

• Revise the programme based on established learners' needs and new innovative strategies in simulation learning.						

Comment: (anything you partially agree/disagree with regarding the relevance and feasibility of the activity)

_____

_____

THANK YOU VERY MUCH FOR YOUR PARTICIPATION!

ANNEXURE 20: SECOND ROUND: DELPHI STUDY DATA COLLECTION TOOL

Dear participant, your opinions were valuable in the first round; thank you. You are kindly requested to assist in reevaluating the 10 activities and advise on what should be done to enhance feasibility:

Domain A: Training/ Preparation of Educators for Simulation

Activity 4: Educators should be trained in how to use simulation equipment and audiovisual devices. This activity did not reach an 80% acceptable level of consensus. However, the participants did not disagree that it is useful, as 75% (n=12) agreed and 25% (n=4) partially agreed that it was feasible to train educators on how to use simulation equipment and audiovisual devices. ***Comment:*** *"How to use simulation equipment and devices might be challenged by a lack of applicable infrastructure and equipment."*

Researcher's comment/question*: Currently, the institutions seem challenged by the lack of equipment. How can the institution ensure the availability of simulation equipment?*

Please reevaluate and advise:

_____

_____

_____

Activity 14: Recruit and train standardised patients (SPs). Only 68.8% (n=11) agreed that it was feasible to recruit and train standardised patients (SPs), and 31.3 (n=5) partially agreed that this activity was feasible. ***Comments***:

- *If the government cannot pay for those (SPs), maybe students can be asked to volunteer for non-invasive procedures, and manikins can also be used".*
- "*It might be difficult to recruit SPs as they may decline due to moral beliefs. However, training is feasible if the equipment is available."*

Researcher's comment: *Training educators on how to recruit and train standardised patients is intended to upskill the educator*.

Please reevaluate and advise:

_____

_____

_____

Activity 19: Faculty members should obtain formal training in simulation that leads to certification (certificate, diploma/degree). Only 56.3% (n=9) agreed that faculty should receive formal training in simulation use. On the contrary, 31.3% (n=5) partially agreed, and 12.5% (n=2) disagreed that this activity was feasible. ***Comments:***

- *"Requires only those involved in simulation. It is a speciality."*
- *"Those interested in certification training may not have funds or support, yet the training is very important."*

Researcher comment/question: The formal training that leads to certification can be through in-service training, workshops, short courses and programmes that lead to certification. It is intended for upskilling educators involved in clinical teaching and learning using simulators.

Please evaluate and advise:

_____

_____

_____

Domain C: Simulation Equipment

Activity 41: Prepare a budget to procure mannequins, prioritising buying low-cost mannequins (Mama Natalia and Neo Natalia, task trainers) at this phase if there are financial constraints. Only 75% (n=12) saw the activity as feasible, while 25% (n=4) partially agreed with the statement. ***Comment:*** *It is not feasible for the institution to buy technological devices unless there is funding.*

Researcher's comment/question: preparing a budget is the initial step to seeking financial support from internal and external organisations. Is preparing a budget plan for procuring low-cost simulation equipment feasible?

Please reevaluate and advise:

_____

_____

_____

Activity 42: Room furnishings (e.g., beds, carts, monitors, medical instruments). Only 75% (n=12) found this activity feasible, 18.8% (n=3) partially agreed, and only 6.3% (n=1) found it not feasible to prepare and plan for the furnishing of the simulation laboratory. ***Comment:*** "T*he institution would need proper infrastructure and funds to procure the furnishings."*

Researcher's comment/question: What alternative options could you suggest for your institution to acquire basic hospital/clinical equipment for the simulation laboratory?

Please reevaluate and advise:

_____

_____

_____

Activity 43: Technological devices and audiovisual systems. A total of 75% (n=12) agreed, 18.8% (n=3) partially agreed, and 6.3% (n=1) disagreed about the feasibility of this activity. **Comment:** *"Depending on the availability of funds."*

Researcher comment/question: *What suggestion would you give to ensure the availability of funds for procuring technological devices such as computers and audiovisual devices to advance simulation-based education in your institution?*

Please reevaluate and advise:_____

_____

_____

Domain D: Simulation Infrastructure:

Activity 51: The department should allocate premises for building the simulation laboratory or renovating/redesigning an existing structure. Only 68.8% (n=11) agreed that the activity was feasible, and 31.3% (n=5) partially agreed. **Comments:**

- "*The university should allocate the department premises since there is already a shortage of space in the existing demo labs*.
- *"The feasibility of the activity is subject to the availability of funds".*

Researcher's comment/question*: Simulation needs to take place in a designated teaching and learning space. How can the issues regarding the allocation of premises for the simulation learning environment be addressed within the current financial situation?*

Please advise:

_____

_____

_____

Activity 52: *Observation room.* Only 56.3% (=9) agreed that it was feasible for the simulation laboratories to have an observation room, while 43.8% (n=7) partially agreed. **Comment:** "*Allocation of extra space to (in) the existing structure may be required, subject to the availability of funds."*

Researcher's comment/question: An observation room is a space where the learners can access the learning experience (presentation of content, watching clinical skills videos and demonstration of skills) within the skills laboratory. How feasible is it to rearrange the layout or repurpose existing structures to create a space for the learners?

Please advise:

_____

_____

_____

Activity 53: *Debriefing room*. A total of 50% (n=8) agreed that it was feasible to have this structure, while another 50% (n=8) partially agreed about the feasibility of the debriefing room. **Comments:**

- *"Having a building with 4 (observation, debriefing, storage, and technician rooms) or more rooms will depend solely on space availability."*
- *"The Midwifery department is located within a small physical space (land) and an infrastructure-challenged campus of the (X)(sic) University. Having the above separate spaces may not be feasible. Therefore, we use one space for all the above listed."*

Researcher's comment/question: Debriefing is a critical component in a clinical course, needed to facilitate learners' meaningful learning after the experience. It can take place in a classroom.

Please review and advise:

_____

_____

_____ **Activity 58: *Build the simulation learning space for the programme***. Only 62.5% (n=10) agreed that it was feasible to build the simulation space for the programme, 31.3% (n=5) partially agreed, and 6.3% (n=1) disagreed. **Comment:** "*The available space can be upgraded because building a simulation lab can take time…due to financial constraints."*

***Researcher's comment/question**: What is your opinion regarding the above comment?*

Please advise*:*

_____

_____

_____

THANK YOU FOR TAKING THE TIME TO RESPOND TO THE QUESTIONS

ANNEXURE 21: SCOPING REVIEW: FEEDBACK FROM REVIEWERS

KEY

- Green colour: included by both reviewers
- Amber colour: unresolved conflict

NB: The third reviewer's feedback is inside the comments box.

Objective: To identify evidence on best simulation-based education practices in undergraduate nursing students' educational preparation locally (Sub-Saharan Africa) and internationally.

Author(s) & Year of publication	Title	Study setting	Purpose/Objectives	Population & Sample Size	Methodology	Findings
Science Direct Database articles						
Decker, Sharon Fey, Mary Sideras, Stephanie Caballero, Sandra Rockstraw, Leland (Rocky) Boese, Teri Franklin, Ashley E. Gloe, Donna Lioce, Lori Sando, Carol R. Meakim, Colleen Borum, Jimmie C. (2013)	Standards of Best Practice: Simulation Standard VI: The Debriefing Process	USA	n/a	n/a	n/a	• Simulation-based learning experiences should include a planned debriefing session to promote reflective thinking. • The skills of the debriefer are essential to ensure the best possible learning; learning without guidance could lead the learner to negatively transfer a mistake into their practice without realising it had been the poor practice, repeat mistakes, focus only on the negative, or develop fixations. • Debriefing promotes understanding and supports the transfer of knowledge, skills, and attitudes, focusing on best practices to promote safe, quality patient care.

McDermott, Donna S Sarasnick, Janice Timcheck, Phillip (2017)	Using the INACSL Simulation™ Design Standard for Novice Learners	Indiana, USA	To discuss the use of the INACSL Simulation Design Standard (SDS) to create a novice simulation experience for sophomore nursing students.	Sophomore nursing students (n = 143)	Pilot study	**Simulation Design Standard** (SDS): (need assessment, measurable objectives, format of SBE, clinical scenario, fidelity, facilitator, pre-briefing, debriefing and feedback, evaluation, participant preparation pilot testing, simulation outcomes) provides a clear format for designing SBE for novice nursing students.
Herlihy, Kesa Teel, Cynthia (2020)	Faculty Perceptions of Nursing Student Preparation in Undergraduate Clinical Simulation	USA	To describe current practices in the student preparation phase of simulation in prelicensure nursing programs located in the western United States from the perspective of faculty currently teaching simulation.	Eight nursing faculty from eight prelicensure nursing schools from two western states located in the US participated in the study	Qualitative study	• Three distinct elements of the **Student Preparation** phase were identified. These elements included: (1) preparation activities, (2) orientation, and (3) prebrief. • In addition, two characteristics of student preparation were identified: (a) variation (Variation occurred in the type of activities students completed as preparation for simulation, the amount of time students spent in preparation, the content of orientation and prebrief), and (b) levelling (Student preparation activities also changed according to the level of the students as they progressed through nursing school, with levelling related to the volume of information or preparation required).

Beroz, Sabrina (2017)	A Statewide Survey of Simulation Practices Using NCSBN Simulation Guidelines	USA	To identify faculty and program development needs in SBE across prelicensure nursing programs in one midAtlantic state using the NCSBN simulation guidelines as measured by the checklists.	27 simulation centres were surveyed (15 community colleges awarding an associate degree and 11 universities awarding a baccalaureate degree).	Descriptive mixed method study using a structured interview process.	The findings revealed key areas for faculty and program development: • theory, • standards, • methods, • curriculum integration, • debriefing and • evaluation
Brennan, Brittany A (2022)	The impact of self-efficacy based prebriefing on nursing student clinical	USA	To examine the effects of the Self-Efficacy Prebriefing Model (SEPM) on nursing student self-efficacy and clinical competency.	There were 66 senior Bachelor of Science in Nursing students.	An experimental design with group randomisation	The Self-Efficacy Prebriefing Model (SEPM promoted nursing student selfefficacy and clinical competency in simulation. Self-efficacy judgments come from four sources: enactive mastery experience,

	competency and selfefficacy in simulation: An experimental study					vicarious experience, verbal persuasion, and physiological and affective states. a) Enactive mastery experience- in prebriefing, this can be provided via hands-on simulation orientation and reflecting upon previous experiences related to the current situation. b) Vicarious experience- in prebriefing, this occurs via watching an expert role modelling video and receiving time to plan care for the upcoming simulation. c) Verbal persuasion can happen by encouraging others or letting individuals know they can succeed in a particular behaviour. d) Physiological and affective states occur via activities in standard prebriefing, encouragement, and time to ask questions.
Jacob, Elisabeth R. Sundin, Deb Robertson, Sue Davies, Hugh (2021)	Extended immersive simulation to develop nontechnical skills: Content analysis of students' views	Australia	To investigate students' views on the value of extended, immersive simulation in preparing them for independent practice as registered nurses.	287 final-year nursing students conducted at a university in Western Australia	Cross-sectional research involving content analysis of open-ended survey questions	• Extended immersive simulation facilitated the development of the essential skills required to practise independently and helped them prepare for the registered nurse role. • Many expressed the wish for this type of simulation to be included throughout all years of the nursing curriculum. • Themes: critical thinking, the role of the registered nurse, communication, time management, teamwork and leadership

Parker, Kimberly C. Welch, Teresa D. (2021)	Innovative teaching strategies to escape the anxiety in simulation	USA	To provide detailed instructions and demonstrate how to easily develop meaningful, fun and engaging escape room exercises for students yet manageable and budget-friendly for faculty.	**n/a**	**n/a**	• When integrated into the simulation experience, escape room exercises effectively decrease student anxiety and improve learning outcomes. • They also improve teamwork, communication skills, and familiarity with simulation environments by engaging the student in an interactive learning experience and providing immediate and ongoing constructive feedback.
McFaden, Cheryl (2020)	Simulation realism, contextual fidelity, and unintended lessons	USA	To examine common simulation practices that can create unintended student learning.	**n/a**	**n/a**	• The simulation quality highly depends on the simulated experience's design and facilitator skills. • A simulation experience should recreate “real life” to develop the skills and critical thinking required to function safely within a complex clinical environment. • Realism within a simulation scenario is a desired characteristic and is supposedly achieved by the fidelity created within the scenario. • Fidelity can be achieved by designing a case that logically relates to the patient history and assessment findings, creating an environment that allows the learner to immerse himself in the scenario. • Contextual fidelity should include the reality of healthcare facility system processes to connect the simulation objectives to the clinical area. • Creating appropriate clinical context and proactive simulation also requires creating an unfolding patient history. The use of point-of-care references within simulation.

Hall, Karen Tori, Kathleen (2017)	Best Practice Recommendations for Debriefing in Simulation-Based Education for Australian Undergraduate Nursing Students: An Integrative Review	Australia	To establish best practices for debriefing in simulation using highfidelity mannequins and standardised patients.	435 studies were included if they contained all defined search terms.	An integrative literature review was searched.	• It was established that there were eight best practice recommendations to facilitate the debriefing process: (a) types of debriefing (video-assisted and facilitator only), (b) debrief in simulation versus postsimulation (c) the environment in which the debrief takes place, (d) the person who should facilitate the debrief, (e) assessment and training of the person who debriefs, (f) identification of the learning outcomes, (g) method of debriefing, and (h) structure of the debrief.
Ludlow, Jocelyn (2021)	Prebriefing: A Principle-Based Concept Analysis	USA	To examine and define prebriefing, an essential element of simulation design.	Total number of articles to 29	Systematic literature review	• Integrating the three domains of learning with the three-phase model of prebriefing developed: a) The preparatory phase (cognitive domain) b) The orientation phase (psychomotor) c) The prebriefing phase (affective) • Prebriefing with the three learning domains unites the elements of preparation with the concept of prebriefing. It provides a phase-based, structured framework to establish psychological safety, decrease anxiety and extraneous cognitive load, and increase learner engagement with prerequisite knowledge.

Tyerman, Jane Luctkar-Flude, Marian Graham, Leslie Coffey, Sue Olsen-Lynch, Ellen (2019)	A Systematic Review of Health Care Presimulation Preparation and Briefing Effectiveness	Canada	To examine the effectiveness of presimulation preparation and briefing activities for healthcare professionals and students	Twenty-one (21) studies were included.	Systematic review using the Joanna Briggs Institute methodology and critical appraisal tools	• Presimulation preparation and briefing positively affected satisfaction and learning outcomes such as knowledge and skill performance. • Presimulation activities should be tailored to learner levels of clinical and simulation experience.
INACSL Standards Committee (2016)	INACSL Standards of Best Practice: Simulation[SM] Participant Evaluation	USA	Standards of best practice	n/a	n/a	Authentic evaluation of the participants using simulation-based experiences includes the following elements: • determine the intent of the simulationbased experience,

						• design the simulation-based experience to include the timing of the evaluation, the use of a valid and reliable assessment tool, and evaluator training required, • complete the evaluation and interpret the results. **Participant evaluation is:** • Directed by the objectives/outcomes and the intent of the simulation. • Guided by the type: formative, summative, or high-stakes evaluation. **Formative evaluation is conducted to:** • Monitor progress toward achieving outcomes; Provide ongoing formative feedback; Support participant's clinical competencies; Identify and close gaps in knowledge and skills; Assess readiness for real-world experiences; Facilitate teaching and learning. • Requires formally trained facilitators • Use a small group ratio, ideally a minimum ratio of one facilitator per three to five students. **Summative evaluation is conducted:** • At a discrete point in time (i.e., at the end of a course or certain period); In a safe learning environment; After orientation to the environment and equipment; Appropriate level of fidelity necessary to achieve the participant outcomes; Utilising a standardised format and scoring methods (i.e., utilising a standardised scenario that includes information on when to cue, scenario length of time, and other scenario details); With a video recording of the evaluation to allow re-view by multiple trained evaluators.

						• Use a theoretically-based method to determine passing or cut scores where appropriate. • Select a valid and reliable instrument. • Provide rater training for observationbased evaluation. **High-stakes evaluation is conducted:** • At the end of the learning process, but may occur at other times to assess knowledge gaps or identify significant safety issues Based on specific participant objectives. After the consequences and outcomes have been explained to the participants, With predetermined parameters for terminating the scenario for its completion; After the simulated-based experience has been piloted and tested by trained, nonbiased objective raters or evaluators; By an objective rater or evaluator using a comprehensive tool (i.e., checklist or rubric that clearly outlines desirable and undesirable behaviours); After the participant has had the opportunity for multiple exposures to simulation-based experiences including evaluations. • Use an evaluation tool previously tested with similar populations. • Use multiple evaluators for each participant, either directly observed or a video recording.

INACSL Standards Committee, McDermott, Donna S. Ludlow, Jocelyn Horsley, Elizabeth	Healthcare Simulation Standards of Best PracticeTM Prebriefing: Preparation and Briefing	USA	Additions and revisions to the Healthcare Simulation Standards of Best Practice	**na**	**n/a**	Prebriefing activities are intended to establish a psychologically safe learning environment. CRITERION: • The simulationist should be knowledgeable about the scenario and competent in concepts related to prebriefing

Meakim, Colleen (2021)						• Prebriefing should be developed according to the purpose and learning objectives of the simulation-based experience. • The experience and knowledge level of the simulation learner should be considered when planning the prebriefing. PREPARATION CRITERIA: • Based on needs assessment and the purpose of the experience, preparation materials are developed to assure that learners are prepared for the experience and can meet the scenario objectives • Preparation materials should be developed according to the purpose and learning objectives of the simulation-based experience. • Plan the delivery of preparation materials before and on the day of the simulation-based experience. BRIEFING CRITERIA: • Prior to the simulation-based experience, the simulationist conveys essential information to learners regarding expectations, the agenda, and the logistics for the experience

Bryant, Kellie Aebersold, Michelle L. Jeffries, Pamela R. KardongEdgren, Suzan (2020)	Innovations in Simulation: Nursing Leaders' Exchange of Best Practices	USA, Columbia University School of Nursing	To exchange ideas, discuss innovations, and make recommendations for advancing the use of simulation in ways relevant to twenty-firstcentury healthcare professionals.	Fifteen simulation specialists	Discussions following each panel presentation	• Integrating simulation into the curriculum; • Developing faculty to lead experiential learning; • Encouraging students to hone their clinical decision-making skills; • Increasing portability, with more simulations offered on smartphones and tablets; • Interprofessional teamwork training.

						Patient safety: • Simulation evaluation must move beyond its educational value and include the impact on patient safety. • Simulation began as a way to teach technical skills but is now recognised as a way to practice affective domain skills such as empathy and the development of critical thinking skills to prepare students for delivering safe care. • Training of faculty conducting simulations is critical. • Initially seen as an educational method for undergraduates, simulation is now being used effectively for graduate health professionals. Simulation can even play a role in training nonprofessionals • develop practice-ready professionals. • Deliberate practice • Simulations are embedded in experiential learning. • Prebriefing • Debriefing • Reflection and critical thinking. • Simulation scenarios focus on what students must learn rather than what faculty needs to teach. - Best scenarios will likely be developed by a small, multidisciplinary group that includes educators, subject matter experts, and simulation experts. • Virtual gaming simulation offers feedback during the experience. Guidelines for successful simulation integration: • Leadership commitment.

						• Dedicated and appropriate facilities (i.e., physical space). • Appropriate educational and technological resources and equipment. • Qualified simulation lab personnel and faculty who are prepared to lead simulations. • Firm understanding of policies and processes that are part of the simulation experience. Faculty engaging in simulation should follow design standards: • Perform needs assessment; - Construct measurable objectives; - Structure the format of a simulation based on the purpose theory; - Design a scenario; - Use various types of fidelity; - Maintain a facilitative approach; - Begin simulation-based experiences with a prebriefing; - Follow simulation-based experiences with a debriefing and feedback session; - Evaluate the participant(s), facilitator(s), the simulation-based experience, the facility, and the support team; - Provide preparation materials and resources; - Pilot test simulation-based experiences before full implementation. • Interprofessional simulations: improve communication skills

						• A summative assessment should be done once inter-rater reliability is established.

Lioce, Lori	Standards of Best Practice:	USA	n/a	n/a	n/a	• All simulation-based learning experiences begin with developing

Reed, Clinta Che Lemon, Debora King, Michalene A. Martinez, Petra A. Franklin, Ashley E. Boese, Teri Decker, Sharon Sando, Carol R. Gloe, Donna Meakim, Colleen Borum, Jimmie C. (2013)	Simulation Standard III: Participant Objectives					clearly written participant objectives, which are available before the experience. • Participant objectives are the guiding tools for simulation. • Objectives are essential to determine if the outcomes of the simulation-based learning experience have been achieved. • Identifying appropriate scenarios, fidelity, and facilitation methods is crucial to meeting participant objectives. **To achieve the desired outcomes, participant objectives should:** • Address the domains of learning. • Correspond to the participant's knowledge level and experience. • Remain congruent with overall program outcomes. • Incorporate evidence-based practice. • Include viewing of client holistically. • Be achievable within an appropriate timeframe.

Kuszajewski, Michele L Vaughn, Jacqueline Bowers, Margaret T Smallheer, Benjamin Hueckel, Rémi M Molloy, Margory A (2021)	Embracing Disruption: Measuring Effectiveness of Virtual Simulations in Advanced Practice Nurse Curriculum	USA	To (a) design virtual simulations and (b) onboard faculty, staff, and students to virtual simulation-based education while ensuring simulation best practice standards.	n/a	n/a	• The shift to Zoom© technology as an online teaching platform provided a safe, interactive learning environment that maintains fidelity while allowing participants to be seen and heard. • The virtual simulation scenarios: a) Provided learners with an opportunity to experience socialisation with the types of patients they may encounter in the future; b) allowed peer-to-peer interaction; and c) were facilitated by nurse faculty with specific expertise in the content areas. **This interactive team-based approach** allowed collaboration, real-time

						feedback from experienced clinicians and an opportunity to create a shared mental model with other participants throughout the scenario. • Learning was reinforced through deliberate practice as students assumed different roles in subsequent scenario iterations. b) Kolb's experiential learning theory (ELT) provides an ideal structure for developing simulation experiences that support clinical education. Whether hands-on or virtual, simulation allows learners to participate in concrete (real) experiences and enables them to experience what they are learning. • ELT is particularly suited as a framework to guide the use of simulation. It teaches NP students to (a) critically reflect on their prior experience as nurses, (b) actively experiment, and (c) apply new knowledge as nurse practitioners. • ELT is learner-centred: participants control the direction of the simulation scenario, which is determined by their actions and the consequences of those actions. • Reflective observation and abstract conceptualization occur during the simulation (as learners describe and support their actions) and during the simulation debrief.

Sessions, Laura Nemeth, Lynne S.	Use of Simulation-Based	USA	To determine the feasibility of a study on the effectiveness of	141 potential participants	Quantitative & qualitative approach.	Resources to support a simulationbased learning intervention included • high-quality simulators,

Catchpole, Kenneth Kelechi, Teresa (2020)	Learning to Teach High-Alert Medication Safety: A Feasibility Study		simulation-based learning to teach nursing students the safe administration of highalert medications.			• smart pumps, • computers, • audio-visual recording, • rooms for prebriefing and debriefing, and • secure areas for data storage
Mohamed, El Hussein Harvey, Giuliana Kilfoil, Lauren (2021)	Pre-Brief in SimulationBased Experiences: A Scoping Review of the Literature	USA	To present available evidence related to the pre-brief component of simulation-based experiences and its impact on achieving learning outcomes.	15 studies were included in the synthesis.	Scoping review	• Simulation experiences following standardised practices of pre-briefing, scenario or case, and debriefing achieved several educational and professional outcome measures. • Findings indicate a significant improvement in outcome measures related to psychological safety and confidence levels. • Pre-brief also reduced learners' stress, optimised skills and knowledge, and facilitated a reflective and constructive debriefing.

Alexander, Maryann Durham, Carol F Hooper, Janice I Jeffries, Pamela R Goldman, Nathan Kardongedgren, Suzan Suzie Kesten, Karen S Spector, Nancy Tagliareni, Elaine Radtke, Beth Tillman, Crystal (2015)	NCSBN Simulation Guidelines for Prelicensure Nursing Programs	USA	This article presents those guidelines, evidence to support the use of simulation, and information for faculty and program directors on preparation and planning for using simulation successfully in their nursing programs.	An expert panel consisting of representatives from the International Nursing Association for Clinical Simulation and Learning (INACSL), American Association for Colleges of Nursing (AACN), National League for Nursing (NLN), Society for Simulation in Healthcare (SSH), BONs,	n/a	• The simulation program is based on educational theories associated with simulation, such as experiential learning theory. • The faculty members are prepared following the INACSL Standards of Best Practice: Simulation. • A tool for evaluating simulation-based learning experiences has been designed based on the INASCL Standards of Best Practice: Simulation Evaluation Methods. • The program curriculum sets clear objectives and expected outcomes for each simulation-based experience, which are communicated to students before each simulation activity. • The faculty members are prepared to create an environment that encourages active learning, repetitive practice, and reflection and provides
				and NCSBN, developed national guidelines for the use of simulation in the undergraduate nursing curriculum.		appropriate support throughout each activity. • The faculty members are prepared to use facilitation methods congruent with simulation objectives/expected outcomes. • The program utilises a standardised method of debriefing observed simulation using a Socratic methodology. • A rubric has been developed to evaluate the students' acquisition of KSAs (knowledge, skills, and attitudes) throughout the program.

Stoodley, Cathy McKellar, Lois Steen, Mary Fleet, Julie (2020)	Simulation in midwifery education: A descriptive explorative study exploring students' knowledge, confidence and skills in the care of the preterm neonate	Australia	To evaluate the impact a simulated learning activity (insertion and management of a neonatal nasogastric tube) had on midwifery students' knowledge, confidence and skills post-simulation and completion of a clinical placement.	Phase 1: Midwifery students (n=60). Phase 2: Students (n=46)	A descriptive explorative study was undertaken in two phases.	The findings demonstrate that simulation is an effective learning strategy in an undergraduate midwifery program. Students' knowledge, confidence, and skills significantly increased post-simulation activity (p0.001).
Oh, Pok-Ja Jeon, Kyeong Deok Koh, Myung Suk (2015)	The effects of simulationbased learning using standardised patients in nursing students: A meta-analysis	South Korea	To evaluate the effect of simulation-based learning using standardised patients (SPs) on nursing students' cognitive, affective, and psychomotor domain learning outcomes.	A total of 1326 nursing students	meta-analysis was conducted in 18 controlled trials (4 randomised and 14 nonrandomised designs).	Simulation-based learning using SPs appeared to have beneficial effects on the cognitive, affective, and psychomotor domains of learning. In subgroup analysis, SPs showed significant effects on knowledge acquisition communication skills, selfefficacy, learning motivation and clinical competence.
Hayden, Jennifer K Smiley, Richard A Alexander, Maryann	The NCSBN National Simulation Study: A Longitudinal, Randomised,	USA	To provide BONs with evidence on nursing knowledge, clinical competency, and the transferability of learning from the simulation	A total of 666 students completed the study.	A comparison study using a randomised, controlled, longitudinal, multisite design	• These results indicate that the skills learned in simulation transfer to the clinical setting. • With high-fidelity simulation, educators can replicate many patient situations, and students can develop and practice

Kardongedgren, Suzan (2014)	Controlled Study Replacing Clinical Hours with Simulation in Prelicensure Nursing Education		laboratory to the clinical setting.			their nursing skills (cognitive, motor, and critical thinking) in an environment that does not endanger patients. • This study provides substantial evidence that up to 50% simulation can be effectively substituted for traditional clinical experience in all prelicensure core nursing courses under conditions comparable to those described in the study: faculty members who are formally trained in simulation pedagogy, an adequate number of faculty members to support the student learners, subject matter experts who conduct theory-based debriefing, and equipment and supplies to create a realistic environment. • The most important way to ensure high-quality simulation is to incorporate best practices into a simulation program; these best practices include terminology, professional integrity of the participant, participant objectives, facilitation, facilitator, the debriefing process, and participant assessment and evaluation (INACSL, 2013).
McDermott, Donna S (2020)	Prebriefing: A Historical Perspective and Evolution of a Model and Strategy (Know: Do: Teach)		To discuss the historical aspects of prebriefing research and study from its infancy to the current body of work.	n/a	n/a	A three-phase prebriefing model was developed, including planning, briefing, and facilitating. An actively engaged preparation strategy called Know: Do: Teach is provided, as well as the background for how it was developed according to literature surveillance, research, simulation practice and experience.

Gordon, Randy M (2017)	Debriefing Virtual Simulation Using an	USA	To examine the feasibility of offering students an immersive	Family nurse practitioner	Pilot project	• When scheduling debriefing sessions, limit the number of participants to a maximum of 10 students per session. More than 10 students inhibited
	Online Conferencing Platform: Lesson Learned		clinical practicum experience conducted using a virtual learning environment (VLE) as an alternative to an onground traditional clinical site.			engagement and made conversation difficult when multiple students attempted to contribute to the discussion individually. High. • Schedule multiple debriefing sessions weekly, allowing students to self-select and register for the day and time that best suits their schedule. • Schedule debriefing sessions within the shortest time after the learning activities are completed. • Incorporate a best practice meeting with all VLL faculty preceptors once every course and attend at least one debriefing session facilitated by another VLL faculty preceptor. • Plan to debrief students one-on-one should they miss the scheduled debriefing session, but limit this opportunity to a one-time occurrence per course.
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Reid, Carol A Ralph, Jody L El-Masri, Maher Ziefle, Katrice (2020)	High-Fidelity Simulation and Clinical Judgment of Nursing Students in a Maternal–Newborn Course	USA	To explore the difference in clinical judgment between nursing students who participate exclusively in simulation and those who participate exclusively in acute care hospital-based clinical experiences in a maternal–newborn clinical course.	A convenience sample of 62 students enrolled in the maternal–newborn clinical course participated in the study.	Survey: A twogroup, post-test study design was implemented	• High-fidelity simulation allows educators to replicate many patient situations. • These findings suggest that clinical judgment scores are comparable when students participate in simulation clinical experiences compared to hospital-based clinical practice in the maternal–newborns clinical area. • Best practices used in this study, including faculty with experience and training in simulation as a teaching strategy, adequate resources (human and physical) to support learners and create a realistic environment, and content experts to ensure simulations and debriefing are evidence-based, contribute to the strength of the results.

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Willhaus, Janet Averette, Mitzi Gates, Michael Jackson, Janet Windnagel, Susan (2014)	Proactive policy planning for unexpected student distress during simulation	USA	This article offers suggested best practices for identifying and assisting students who exhibit uncontrolled stress in simulation and includes a sample policy for planning.	n/a	n/a	• Simulation laboratories and educational programs need contingent policies and procedures regarding learner responses to simulation, like those for a fire or other emergencies. • Facilitators conducting simulations should be oriented to the policies and given a copy of the procedure as a part of orientation to the program. • When a learner shows signs of uncontrolled stress during a simulation, it is preferable to rely on the expertise of professionally trained staff, even though facilitators may be tempted to take on the role of counsellor. • Planning for a simulation should include identifying a ‘‘backup’’ facilitator, administrator, or staff member who can be readily available if a learner with a concern needs assistance. To allow the remaining learners to continue the simulation activity with minimal disruption. • A learner with a mental or physical condition that interferes with simulation or clinical practice may not be aware of the condition until participating in the simulation. Facilitators should refer learners with these conditions to request accommodations with the university or community college office that handles learners with disabilities. • Allowing learners to participate in a scenario, debrief, and then participate again in the same scenario followed by another debriefing has shown promise in decreasing individual stress appraisal scores. • As a part of good planning practices, facilitators might prepare an alternate

						assignment (case study) for certain types of simulations. Simulations involving suicide assessments, death or dying, assessment of intimate partner violence, and other potentially sensitive subjects may uncover feelings and responses in learners who have had personal experiences that negate the learning process. • Most simulation programs require learners to sign a confidentiality agreement and/or consent form to be videotaped during the initial orientation to the simulation laboratory. One option to increase learner awareness and encourage self-identification of any potential uncontrolled stress problems before a scheduled simulation experience is to add a written statement to the release form acknowledging this issue and directing learners to contact designated facilitators if they think they may be affected.

Victor, Joyce (2017)	Improving clinical nursing judgment in prelicensure students	USA	To examine differences in mean clinical nursing judgment development scores between students who completed the nursing program prior to the introduction of the experiential learning theory (ELT) simulation design and those who completed the program after the adoption of its use for all scenario-based SBL activities	The total sample of 204-102 in Cohort A and Cohort B, students who completed the final 3 years of their baccalaureate nursing program, they were randomly selected.	A retrospective review of LCJR scores was conducted.	• Theories and models used as the basis for SBL should be linked to outcomes (Jeffries, 2016; Lioce et al., 2015). • Using an ELT simulation design for students in their first clinical ….. stimulates cognitive, metacognitive, psychomotor, and affective learning. • The ELT simulation design provided new evidence that its use improves outcomes, specifically the development of clinical nursing judgment (Victor Chmil et al., 2015). • This retrospective study found a significant increase in clinical nursing judgment for nursing students at both the beginning and end of a baccalaureate program in which all
						scenario-based SBLs used an ELT design. • INACSL also emphasises the need for measurable outcomes (Sando et al., 2013).
Brown, Diane K. Wong, Ambrose H. Ahmed, Rami A. (2018)	Evaluation of Simulation Debriefing methods with interprofessional learning	USA	to determine the best practices in IP simulation debriefing by comparing different debriefing models.	Single debriefer (n = 253) and IP co-debriefers (n = 151).	A 2-group quasiexperimental cohort comparative design. The	• We found statistically significantly higher scores for in-person (M = 5.79) compared to teledebriefing (M = 4.96, p < .001). Single debriefer (M = 6.09) compared to IP co-debriefer DASH scores (M = 5.93) for all scenarios were not significantly different (p = .059). Our results suggest that teledebriefing may provide a solution for simulation programs with off-site or rural learners. A single in-person debriefing can be equally effective as co-debriefing for IP students.

Zapko, Karen A. Ferranto, Mary Lou Gemma Blasiman, Rachael Shelestak, Debra (2018)	Evaluating best educational practices, student satisfaction, and selfconfidence in simulation: A descriptive study	USA	To examine student perception of best educational practices in simulation and evaluate student satisfaction and self-confidence.	n/a	n/a	• Simulation minimises the variability of hospital or community-based experiences, providing a more consistent and predictable learning environment.
Larsen, Terry A. Schultz, Mary Anne (2014)	Transforming simulation practices-a quest for return on expectations	USA	To illustrate how international standards of best practices can transform the existing structure and processes of such a simulation program and to elucidate its value.	n/a	n/a	• Participant objective: best practices in simulation begin with clearly stated objectives given to students before the scheduled simulations. • Facilitation • Facilitator: To ensure a shared understanding of the direction and nature of the programmatic changes about to occur, a basic introductory simulation workshop was required for all existing and incoming simulation faculty.

						• Debriefing: Adopting this ethic allows faculty to give constructive feedback. • Evaluation.

Davis, Diane Koppelman, Dara Gordon, Jessica Coleman, Susan V Heitzler, Ella T Fall-Dickson, Jane M (2018)	Effect of an Academic–Community Partnership Simulation Education Program on Quality and Safety Education for Nurses Competency Domains for Bachelor of Science in Nursing Students	USA	This study explored the effects of an academic community partnership Simulation Education Program on the QSEN domains of teamwork, collaboration, and patient-centered care.	Participants (N =32) were bachelor of science in nursing (n = 11) and medical assistant students (n =21).	A mixed methods study using a quasiexperimental prepost design.	Results suggest that simulation with role-play is a best practice to promote teamwork, collaboration, and patientcentred care competencies.
Kostovich, Carol T. O'Rourke, Jenny Stephen, Lee Anne (2020)	Establishing psychological safety in simulation: Faculty perceptions	USA	To explore nursing faculty's perceptions of psychological safety within a simulation learning environment for pre-licensure nursing students.	Thirty-seven nursing faculty participated in the study	Qualitative descriptive approach	During the pre-brief phase: • faculty clearly describe the purpose of the simulation experience as a time to practice, where mistakes are viewed as learning opportunities rather than punishable acts. • The distinction between learning and evaluation is made, emphasising that simulation is not graded but provides time to practice without harming a patient. • A schedule of the day's events is shared, and an orientation to the simulation space is provided, including the mannequins, equipment, supplies, and resources. • The role of the faculty as facilitator is explained and student roles are delineated to diminish the uncertainty of moving into the scenario phase. • Both students and faculty agree to keep the activities of the simulation

						day confidential, endorsing 'the Vegas rule.' During the scenario phase of simulation: • Students cared for the patients in pairs or small groups so no one would be singled out and potentially embarrassed. • During the scenario phase, students were empowered to call for a 'time-out' or stop the simulation if they became uneasy. • Students can choose to 'opt out' or seek counselling or support services if needed. • Resources include textbooks, drug references, and the ability to call the charge nurse or other healthcare providers for assistance. Debriefing Phase: • Respectful communication among faculty and students. • Faculty often share their own vulnerabilities in an attempt to support a psychologically safe environment.

Sarfati, Laura Ranchon, Florence Vantard, Nicolas Schwiertz, Vérane Larbre, Virginie Parat, Stéphanie Faudel, Amélie Rioufol, Catherine (2019)	Human-simulationbased learning to prevent medication error: A systematic review	France	To improve knowledge, skills, and attitudes in prescribers, nurses, and pharmaceutical staff, these methods enable training without directly involving patients.	64 studies were identified in Medline, 21 of which were included in the review	A systematic review	Key elements for an effective human simulation-based learning program for medication error (EM) prevention are scenario design, debriefing, and perception assessment.

Reibel, Melody D. Cason, Melanie Screws, Sarah (2019)	Creating a Simulation Experience to Promote Clinical Judgment	USA	This article presents the development and application of a simulation experience to promote clinical judgment by a faculty member who lacked previous experience writing simulation scenarios.	n/a	n/a	• Faculty members with minimal simulation writing experience can create multifaceted high-fidelity simulations through collaboration with simulation experts. • Skilful scenario development requires collaboration with simulation experts and adherence to Standards for Best Practices established by the INACSL, but the course faculty can initiate the process. • Reflection is vital to the critical thinking process. Self-assessment with the LCJR following the simulation allows the participants to reflect on their own actions for effectiveness and concretely and objectively identify areas for improvement. • Using the PEARLS debriefing approach by the simulation facilitator promotes students' reflection on decisions and actions taken and the need for alternate decisions and actions. • Valuable evidence-based resources are available to assist faculty in developing rich scenarios that incorporate critical actions of practice.

Guimond, Mary Elizabeth Foreman, Stephen E Werb, Mike (2019)	Evaluation of an unfolding obstetric experience simulation in an undergraduate nursing program	USA	To evaluate the obstetric simulation in terms of students' ability to communicate important information from shift to shift during a simulated clinical experience after practising communication skills during the complex obstetric simulation and whether they can	A convenience sample of juniorlevel nursing students (n=53) participated in the study	Pre/post-test design	We designed an unfolding, obstetric simulation that allowed students repeated opportunities for deliberate practice after micro-debriefing. • The Obstetric Nursing Self-Efficacy (ONSE) tool is specific to obstetric nursing skills. It measures student perception of their belief that they can fully assess the patient, intervene as necessary, and subsequently communicate changes to colleagues, providers, and patients.
			transfer those skills to similar scenarios			• Few studies have demonstrated the transfer of skills learned in simulation to the clinical environment; the improvement in SBAR scores was a promising indication that students could transfer the skills learned in simulation, as evidenced by an improved ability to organise and communicate information during a handoff or provider report. • Structured observed simulations are beneficial in that they can correct overconfident behaviour and improve or validate higher self-efficacy beliefs. • Our students improved in both selfefficacy and in communication skills scores after repeating the simulation with standardised patients.

Anderson, Elizabeth Bennett, Simon (2020)	Taking a closer look at undergraduate acute care interprofessional simulations: lessons learnt.	UK	To feed back into the IPE curriculum theme to illuminate whether students were ready for interprofessional collaborative practice and also to highlight how to better prepare and support students in an interprofessional simulation	Final year students participated (medical, nursing, operating department practitioner, pharmacy; n = 230).	Mixed methods study. The evaluation combines traditional methods with direct observations of students.	• The findings support an IPE curriculum with a set of theoretical principles aligned to a set of team working skills in readiness for participating in undergraduate/preregistration interprofessional simulations (UIPsims) • Facilitators should be trained on the principles of IPE and best practice for simulations. • Briefing is vital, enabling students to form a team and find their collective voice. Observational
Liaw, Sok Ying Koh, Yiwen Dawood, Rabiah Kowitlawakul, Yanika Zhou, Wentao Lau, Siew Tiang (2014)	Easing student transition to graduate nurse: A simulated professional learning environment (SIMPLE) for final year student nurses	Singapore	To describe the development, implementation and evaluation of a simulation program known as SIMulated Professional Learning Environment (SIMPLE) in preparing the final year student nurses for their clinical practicum in	94 final-year student nurses participated in the 15-hour SIMPLE program.	A prospective, quasiexperimental pretest and posttest design	• A critical success of the SIMPLE program was using a simulation strategy and the involvement of practising nurses that closely linked the students with the realities of current nursing practice to prepare them for the role of staff nurses. • The simulation must reflect the contextual realities of everyday practice.

			transition to graduate nurse practice.			• Simulated patients, relatives, and health professionals were trained and used within realistic scenarios to enable them to apply and integrate these complex skills. • Including interprofessional teams within the SIMPLE program has added tremendously to the authenticity of the students' simulation experience. • The academic and clinical staff helped the students recognise the gaps in managing clinical situations and their clinical performances, and the simulated patients provided feedback that helped them see perspectives through the eyes of patients or relatives.
Verkuyl, Margaret Lapum, Jennifer L. St-Amant, Oona Hughes, Michelle Romaniuk, Daria McCulloch, Tara (2020)	Exploring Debriefing Combinations After a Virtual Simulation	Canada	This study explores the following debriefing practices: self-debrief only, self-debrief followed by a smallgroup debrief, and selfdebrief followed by a large-group debrief.	A convenience sample of firstyear nursing students (n = 19) was conducted.	A focus group study methodology	• Our study suggests combining selfdebrief with a group debrief as a practical solution, allowing for timely individual reflection and an extension of this reflection with peers. • The level of the student and the learning outcomes need to be considered so that debrief questions effectively guide the student through a systematic reflection, particularly in the self-debrief format when there is no guidance from a debriefer. • Instructions with the self-debrief should include answering the questions immediately after completing the virtual experience while the students' thoughts and emotions are still raw. • If adding a group debrief, students should be directed to bring their completed self-debrief to refer to their responses during the discussion.

Wands, Lisa Marie	Positive outcomes of rapid freeware	USA	To describe the innovative way	42 senior nursing students.	n/a	• Sessions were facilitated by one or two faculty members with expertise in the content area of the simulation.

Geller, Daniel E. Hallman, Melissa (2020)	implementation to replace baccalaureate student clinical experiences		nursing faculty met the challenge of transitioning clinical learning to online delivery by using existing online simulation-based learning experiences (SBLEs) and incorporating them into interactive synchronous sessions for baccalaureate nursing students enrolled in their final-semester clinical course.			• The prebrief was limited to no more than 15 minutes and included an orientation on how the session would unfold and what was expected of student participation. • Debrief sessions lasted approximately 30 minutes and started with the basic plus/delta approach (i.e., What worked well? What would you change?).
Brohard, Cheryl Moreland, Earline Shammas, Samer Tonsul, Roberto (2021)	From Development to Implementation : The Effectiveness of a HighFidelity Simulation for Advance Care Planning for Undergraduate Nursing Students	USA	To describe undergraduate nursing students' perceptions of satisfaction, selfconfidence, student knowledge and learning, collaboration, and communication in conducting advance care planning as part of caring for a terminally ill patient in a high-fidelity simulation built using the Healthcare Simulation Standards of Best Practice.	181 students were included in the analysis	An exploratory, descriptive, quantitative study conducted prospectively without randomisation. SurveyMonkey to collect data from students.	• The high-fidelity simulation for advanced care planning was feasible and sustainable. • As an investment in student learning, high-fidelity simulation increased the students' active learning, collaboration, communication, satisfaction, and self-confidence while learning how to conduct advance care planning for the terminally ill. **BUDGET:** • The cost of the equipment, supplies, training, and resources is an integral part of the preparation for a successful simulation experience for students and instructors.

Shaw-Battista, Jenna Belew, Cynthia Anderson, Deborah van Schaik, Sandrijn (2015)	Successes and Challenges of Interprofessional Physiologic Birth and Obstetric Emergency Simulations in a Nurse-Midwifery Education Program	USA	To describe childbirth simulation design and implementation within the nurse-midwifery education program at the University of California, San Francisco.	n/a	Need assessment	Best practices in simulation development and implementation, including curriculum revision grounded in needs assessment, case- and eventbased clinical scenarios, optimisation of fidelity, and ample time for participant debriefing. Adequate preparation and attention to detail increased the immersive experience, and the benefits of simulation were incorporated.
Kim, Sujeong Park, Chang O'Rourke, Jennifer (2017)	Effectiveness of online simulation training: Measuring faculty knowledge, perceptions, and intention to adopt	USA	Using the Theory of Planned Behavior, this study evaluated the effectiveness of an online simulation training program, examining faculty's foundational knowledge of simulation and perceptions and intention to adopt.	A convenience sample of 52 faculty participants.	One-group pretest-posttest design	• Best practice standards of simulation recommend standardised simulation training for nursing faculty. • Online simulation training provides an effective alternative for training large numbers of nursing faculty who seek to implement best practices of standards within their institutions.

White, Meagan (2017)	Keep Calm and Simulate on Faculty Experiences and Insights Into Implementing Best Practices in Simulation	USA	By reading this article, faculty will gain insight into the organisation, preparation, and structuring of simulation experiences in consideration of INACSL best practices.	n/a	n/a	1. Preparation: Implementing Best Practices Before the Simulation Experience • Faculty may utilise templates to develop clinical scenarios or customise standard scenarios available for purchase. • Orienting learners to the simulation environment and leading a practical prebriefing session requires faculty planning. • Educators should begin the process of scenario development by creating learning objectives based on specific course objectives and outcomes • faculty create a preparation guide for students that would also serve to organise and structure prebriefing activities as outlined by best practices in INACSL Standards of Best Practice: Simulation, Standard IV: Facilitation • Students were given the guide a week prior to the simulation experience so that they could review the defined objectives • Faculty also used the guide to lead a prebriefing session on the day of the scheduled simulation experience.

						• Educators also followed prebriefing best practices by familiarising students with equipment in the simulation room, reviewing communication tools such as the Situation, Background, Assessment, and Recommendation (SBAR) form, and providing time for planning care. • Educators must develop an organised simulation guide before hosting a prebriefing and orientation session. • Faculty can begin this process by selecting patient information for inclusion in student preparation materials, considering the clinical level of the student • nursing faculty to create a “psychologically safe” environment by allowing students to explore the simulation equipment and resources before scripted patient care. 2. Facilitation: Implementing Best Practices During the Simulation Experience • INACSL Standards of Best Practice: Simulation, Standard IV guides faculty as they prepare for the facilitation of learning before, during, and after the simulation experience • Group planning helps build a collaborative learning environment by allowing all members to actively participate in the preparation process despite the roles played during the simulation. **Providing cues:** • Standard IV: Facilitation, Franklin et al. (2013) state that cueing and coaching help redirect the simulation

						scenario and guide participants toward discovery.

						• The first step toward successful cueing includes the development of a scenario template for the organisation of essential simulation elements. • Faculty used verbal cues when the simulation stalled, or students took longer than the allotted time to gather pertinent data or perform patient assessments. • Faculty should organise escalating prompts—listing vague cues to direct student assessments or interventions. • Nursing faculty can maximise learning during simulation experiences and ensure positive student learning outcomes through awareness and implementation of the INACSL Standards of Best Practice: Simulation.
Dale-Tam, Jennifer Menard, Prudy Posner, Glenn (2021)	An Educational Intervention to Improve Simulation Facilitation by Nurse Educators in a Large Canadian Academic Hospital: A Mixed Methods Evaluation	Canada	The primary aim of this project was to improve the quality of simulation facilitation and debriefing by NEs within the hospital during CNO. A secondary aim of this project was to improve the comfort and confidence of the NEs when facilitating simulation sessions, hypothesising that this would result in improved debriefing quality.	Twenty-one NEs completed the Introduction to Simulation workshop online presurvey, and 18 completed the post-survey. Technical	Mixed methods of qualitative and quantitative processes	• Best practices in simulation-based education indicate that a trained simulation instructor should facilitate sessions. • debriefing should be facilitated by a trained simulation instructor (INACSL • The Champions program was created to create a greater capacity for simulation facilitation and contribute to the program's sustainability.

Franklin, Ashley E. Sideras, Stephanie Dodd, Caitlin Hutson, Jeremy (2021)	A Randomised Trial of Multiple-Patient Simulation Preparation to Improve Novice Nurses' Competence	USA	To determine best practices for multiplepatient simulation (MPS) preparation and frequency to improve behavioural performance in nursing students.	73 prelicensure novice nurses were enrolled in capstone clinical courses at two schools of nursing	A multisite, blinded, randomised trial was conducted	• MPS helps novice nurses develop higher-order thinking skills, like managing multiple tasks, anticipating changes in patient status, and communicating with other providers. • Educators need to decide the complexity level appropriate for prelicensure MPS participants.

	and SelfEfficacy					
Swart, R. Duys, R. Hauser, N. D. (2019)	SASS: South African simulation survey – a review of simulationbased education	South Africa	To describe: i) the state of SBE in anaesthesia within South Africa and a selection of other settings; ii) the learner groups targeted with SBE; iii) the tools used to assess performance during SBE events; iv) the learning objectives targeted; v) the evaluation of the quality and impact of SBE programmes; vi) the resources available within South Africa for SBE; vii) the perceived barriers to the implementation of SBE in South Africa; viii) the attitudes towards SBE; and ix) research and collaboration	A total of 1 859 emails were sent, and 60 responses were captured	cross-sectional survey of	• the tool most commonly used to assess the quality of learner performance during SBE for summative assessment was ‘expert opinion’ (33%); • the most frequent methods of evaluating SBE quality were participant feedback (42%) and peer evaluation (22%); • the impact of SBE was most frequently assessed by informal discussion (42%) and learner feedback (39%).

Tjoflåt, Ingrid Koyo, Samwel Ligmas Bø, Bodil (2021)	Simulationbased education as a pedagogic method in nurse education programmes in sub-Saharan Africa – Perspectives from nurse teachers	Madagascar & Tanzania	To describe and discuss nurse teachers' experiences with simulation as a pedagogic method in two educational programmes in low–income countries in sub–Saharan Africa.	Nine teachers from the two nurse education programmes were interviewed- four teachers were from Madagascar, and five were from Tanzania.	Descriptive and qualitative design.	• The teachers also stressed the importance of being a competent facilitator and having detailed knowledge about the topic simulated • during the debriefing phase, asking questions and encouraging learning was important. • The findings also highlight the importance of the facilitator role in the briefing phase, describing the objectives and equipment in the scenario, • The Tanzanian teachers stated that it was necessary to instruct the students on how to simulate, • The teachers seemed to use the simulation sessions as an opportunity
						to observe and evaluate the student's knowledge and skills during the simulation sessions, though asking questions and encouraging learning.

Moabi, Pule Solomon Mtshali, Ntombifikile Gloria (2021)	Nursing education institutions' readiness to fully implement simulationbased education in Lesotho	Lesotho	To assess the readiness of the four private nursing education institutions in Lesotho to implement simulationbased education and to describe facilitators and barriers to implementing simulation-based education.	63 nurse educators from private nursing education institutions were included in the study.	A quantitative, descriptive design	• Simulation laboratories need to be manned by qualified personnel • , and the management of the institutions needs to create an enabling environment for the implementation of simulation-based education. • Management should motivate nurse educators to implement simulationbased education and implement policies to support this. • When nursing schools replace clinical hours with SBE, the institutions must develop integrated and sustainable simulation-based curricula. • As simulation learning is part of clinical practice, simulation must be allocated time within the clinical hours. • Integrating simulation into the curriculum can enhance defined needs and support for change. • Simulation can be incorporated into nursing curricula, allowing students to care for simulated patients in a controlled environment. • Educators with strong positive attitudes towards SBE are aware that students need to be supported during simulation-based learning. • Resources needed to ensure the smooth running of SBE include medical supplies and mannequins. • Simulation activities can be sustained even in the absence of developmental partners. **For the simulation to be successful:**

						• It should be included in the institutions' strategic and operational plans. • Managers should provide a written commitment to SBE, and as a result, nurse educators become ready to implement SBE and feel the need to integrate SBE into the curriculum. • SBE requires qualified simulation lab personnel. • Sustainable practices could include full stakeholder engagement to maximise the use of simulation. • Institutions must establish clear reporting structures for SBE, and all individuals involved should make sharing outcomes part of their daily practice.
Matlala, Sidwell (2021)	Educators' perceptions and views of problem-based learning through simulation	South Africa	To explore healthcare educators' perceptions and views on how simulation can facilitate problem-based learning.	Thirteen educators from the Faculty of Health Sciences of the University of Johannesburg	A qualitative, exploratory, descriptive and contextual research design	• For simulation and problem-based strategy to be effective, problems should be selected from the wide variety of current healthcare issues that affect students and their teaching and learning environment. • The task teams need to determine the theoretical and clinical hours at different levels of training in accordance with regulatory requirements. • Simulated problem-based scenarios encourage learners from various disciplines to identify and solve problems together through online sources and applications to engage and share information with local and global universities. • Online simulated PBL strategies are essential in the current COVID-19 situation, where clinical placement of students in various healthcare facilities is challenging.

van Vuuren, Viola Janse Seekoe, Eunice Goon, Daniel T. (2018)	The perceptions of nurse educators regarding the use of highfidelity simulation in nursing education	South Africa	To determine the perceptions of nurse educators regarding the use of high fidelity simulation (HFS) in nursing education at a South African private nursing college	79 nurse educators and clinical training specialists completed the survey.	A quantitative descriptive research design	• The findings indicate that everyone is at the same level as far as technology readiness is concerned. However, it does not play a significant role in the use of HFS. These findings support the educators' need for training to prepare them to use simulation equipment adequately. There is a need for further research to determine what other factors play a role in the use of HFS and if the benefits of HFS are superior to other teaching strategies warranting the time and financial commitment. The findings of this study can be used as guidelines for other institutions to prepare their teaching staff for the use of HFS.

Grota, Patti G O'Neal, Cynthia (2020)	Using International Nursing Association for Clinical Simulation and Learning Standards to Evaluate the Rigor of High-Fidelity Simulation Learning Experiences (SLE)	Australia	To share an approach applying The International Nursing Association for Clinical Simulation and Learning (INACSL) Standards to support substituting twohour traditional clinical with one hour of highquality, rigorous simulation or SLE as determined by faculty governance.	n/a	n/a	• The first and most crucial step for standardising an approach was to adopt a theoretical framework, simulation definitions, and simulation education standards. • After comparing skills taught and performed in low-fidelity simulation with SLE using high-fidelity simulation, the faculty proposed that high-fidelityquality SLE should be substituted at a higher ratio to clinical than performance skills. • Although all INACSL Standards were adopted, the faculty found that specific standards (simulation design, outcomes and objectives, facilitation, debriefing, and participant evaluation) supported the development of SLEs based on sound educational principles. • Based on the need assessment, the SLE performance objectives must link the curriculum to the clinical performance objectives.

						• Education is required to develop and maintain skills as an effective facilitator. • It is recommended that a facilitator's skills be assessed to ensure they are effective, particularly in the debriefing phase. • The faculty reviews the aggregate of their responses to determine areas of simulation improvement. • Faculty also evaluates students for achievement of the SLE performance objectives and offers formative feedback based on observation and discussion points emphasised during de-briefing

Zitzelsberger, Hilde Coffey, Sue Graham, Leslie Papaconstantinou, Efrosini Anyinam, Charles Dodd, Greg Mangal, Jacqueline (2017)	Exploring Simulation Utilisation and Simulation Evaluation Practices and Approaches in Undergraduate Nursing Education	Canada	To investigate simulation utilisation and simulation evaluation practices used among undergraduate nursing educational programs in Ontario, Canada, to establish a “picture” of current trends, practices, and approaches related to simulation employed within this province.	36 educational institutions (14 universities and 22 college partners) were involved.	A mixed methods approach was utilised.	• A variety of evaluation practices applied to examining the simulation itself (e.g., theoretical constructs, linkages to learning outcomes, evaluative tools such as rubrics and checklists, pre-briefing methods, and debriefing methods, evaluation of personnel directly involved in teachinglearning activities) are critical quality improvement initiatives. • Increased support and resources are needed to support simulation utilisation and simulation methodology in nursing education, especially regarding professional credentialing and training and ongoing professional development of simulation educators. • Developing an accurate understanding of the common range and patterns of utilisation of simulation for nursing education and the practices and approaches to simulation evaluation is a critical starting point in the comprehensive development of strategies geared toward effectively integrating simulation into undergraduate nursing curricula.
Rystedt, Hans Sjöblom, Björn (2012)	Realism, authenticity, and learning in healthcare simulations: Rules of relevance and irrelevance as interactive achievements	Sweden	In contrast, two different simulators were used to explore the requirements to establish and maintain simulations as authentic representations of clinical practice.	Theoretical paper	n/a	• The realism of the simulation is maintained through the participants' mutual orientation to the moral order of good clinical practice and a proper simulation. • The design of simulation activities needs to account for the possibility of participants understanding the specific conditions of the simulation and the work practices that the simulation represents.

Keskitalo, Tuulikki (2012)	Students' expectations of the learning process in virtual reality and simulationbased learning environments	Finland	To describe first-year healthcare students' expectations regarding teaching, studying, and learning in such environments.	97 first-year healthcare students'	Quantitative research	Students' expectations of teaching (M=3.65; SD=0.54) in virtual reality (VR) and simulation-based learning environments (SBLEs) were relatively high; 49.5% of the respondents had quite high expectations of teaching in these environments, and 5.2% expected a lot. Most often, students expected that teaching would help to develop their competence (M=4.16; SD=0.83), would be stimulating (M=3.99; SD=0.92), and that students' needs were the starting point for teaching (M=3.86; SD=0.97). Some of the students expected that they could familiarise themselves and practise with the equipment, but others had lower expectations in this regard. These results indicate that students expected their studying to be constructivist and self-directed. Transferable learning outcomes" was used to describe the expectations for learning in these environments. Individual items indicate that students often expected to learn applicable things and that learning in VR and

						SBLEs would help them understand things. Students expected their instructors to be competent and well prepared for teaching and give clear examples. The results show that students' expectations concerning their academic self-perception were moderately high. Students were especially confident they could manage different exercises (M=3.86; SD=0.85) and pass the course (M=3.73; SD=0.84). Individual items indicated that most often, students expected that the atmosphere would be relaxed (M=3.99; SD=0.77) and comfortable (M=3.76; SD=0.77) during the lessons and that embattled students would get help (M=3.70; SD=0.92). • Inspiring and individually tailored teaching; • Individual and competence-based studying; • Transferable learning outcomes; • Competent and well-prepared instructors; • Confident and competent students (academic self-perception); and • A relaxed and comfortable atmosphere.

McLaughlin, Michael P. Starobin, Soko S. Laanan, Frankie Santos (2010)	Medical simulation in Community College Health Science curriculum: A matrix for future implementation	USA	To provide a comprehensive overview of medical simulation and develop a set of conclusions or recommendations for the nation's comprehensive community colleges regarding the need to implement and integrate	17 individuals were comprised of deans and directors from Iowa's 15 comprehensive community colleges' health education programs	Quantitative research -survey questionnaires	• It is best to gradually and reflectively embark on a cautious and thoughtful integration of simulation. This should be done with an eye towards outcomes, best practices, and what is best for the students and the healthcare community being served. • An objective system enabling institutions to rank themselves among other institutions according to criteria may help each school's integration strategies.

			medical simulation into health science curricula.			• Lowa's Community College Health education leaders understand the importance and value of integrating medical simulation into their curricula; they also realise that investment in technology, infrastructure, and human capital is significant. • Rather than have to choose between all or nothing, this project has suggests a middle-ground option where administrators and educators can gradually integrate simulation into their health science curriculum, concentrating on areas where they are best suited to focus funding, expertise, and people.

Barnes, Jonathan PatersonBrown, Lucy (2017)	Improving Care of Critically Unwell Patients through Development of a Simulation Programme in a Malawian Hospital	Malawi	To develop a training programme that would equip the nursing staff at the Fistula Care Centre with the clinical knowledge, practical skillset and communication skills to recognise and manage acutely unwell patients and know when and how to call for help.	20 Malawian nursing staff.	Quantitative research study using a self-report questionnaire	• Despite the essential equipment used in our course, we received very positive feedback and feel that this highlights that significant improvements in staff skillset, and therefore patient outcomes, can be achieved using a relatively simple and low-cost intervention that can also easily be continued by local members of staff, ensuring sustainability. • The introduction of similar courses in other low-resource settings may help improve outcomes without the significant financial outlay and lack of future-proofing seen with many deployed healthcare initiatives that are often unsuccessful in the developing world.
FROM REFERENCE LIST						
Sawyer, Taylor Eppich, Walter	More Than One Way to	USA	This review provides novice and advanced	N/A	Review	• Facilitator-guided post-event debriefing is the most commonly used

Brett-Fleegler, Marisa Grant, Vincent Cheng, Adam (2016)	Debrief: A Critical Review of Healthcare Simulation Debriefing Methods		simulation educators with an overview of various methods of conducting healthcare simulation debriefing.			and studied simulation debriefing method. • Learner-guided post-event debriefing has a small body of supporting evidence indicating that it can effectively improve behavioural skills. • Facilitator-guided within-event debriefing has been explored to a limited extent but may be beneficial in improving technical skills, adherence to resuscitation guidelines, and mastery of learning goals. • Debriefing conversational structures: — have been used extensively during facilitator-guided post-event debriefing. — Employing a predefined structure enables the facilitator to act as a conversational guide during the debriefing. — Allows the conversation to unfold orderly, promotes efficient use of time, keeps the discussion on track, and focuses the conversation on essential learning objectives. — Without a conversation structure, the debriefing conversation risks degrading into an unfocused series of comments or observations. • Novice learners and those with limited experience with the simulation scenario will likely require significantly more instructor-driven debriefing methods, such as directive feedback. • More experienced learner groups will likely need less feedback, and the debriefing conversation will likely progress well using learner-driven

						techniques, such as learner selfassessment and team self-correction.

						• Using advocacy inquiry and circular questioning may work well with either type of learner, depending on the context and content of the simulation and the level of insight of the individual learners. • Code briefing, scripted debriefing, and video review are adjuncts that facilitators can employ to attempt to enhance the debriefing experience. • Ensuring psychological safety, establishing a shared mental model, addressing key learning objectives, and using open questions and silence is mandatory for debriefing.
McMahon, Erin Jimenez, Francisco A. Lawrence, Kay Victor, Joyce (2021)	Healthcare Simulation Standards of Best Practice™ Evaluation of Learning and Performance	USA	Revised standards of best practice	n/a	n/a	Evaluation of the learner(s) using simulation-based experiences (SBEs) includes the following elements: • Determine the type of evaluation for the SBE - SBEs may be selected for formative, summative or high-stakes evaluation. • design the SBE to include the timing of the evaluation • use of a valid and reliable evaluation tool • evaluator training • completion of the evaluation, interpretation of the results and provision of feedback to the learner(s).

Sando, Carol R. Coggins, Rita M. Meakim, Colleen Franklin, Ashley E. Gloe, Donna Boese, Teri Decker, Sharon Lioce, Lori	Standards of Best Practice: Simulation Standard VII: Participant Assessment and Evaluation	USA				**Formative Assessment:** • Formative feedback provides information to improve performance and behaviours associated with the three domains of learning: cognitive (knowledge), affective (attitude), and psychomotor (skills). • Assessment should consistently provide constructive feedback, such as
Borum, Jimmie C. (2013)						coaching, cueing, prompting, or concept mapping. **Summative Evaluation:** • The summative evaluation focuses on the measurement of outcomes or achievement of objectives. • Summative evaluation of the participant's performance or competence occurs at the end of a predetermined period. • Sometimes, the evaluation tool may be shared with participants in advance. **High-Stake Evaluation:** • Evaluation of participants' performance by objective observers or raters increases objectivity and diminishes biased assessment. • Moreover, interrater objectivity and reliability are enhanced using standardised checklists that assess specific skills. • Detailed tools specifically identify appropriate and inappropriate behaviours and help decrease subjectivity.

Lioce, Lori Meakim, Colleen H Fey, Mary K Chmil, Joyce Victor Mariani, Bette Alinier, Guillaume (2015)	Standards of Best Practice: Simulation Standard IX: Simulation Design	USA				Simulation design should consider the following elements to achieve optimal outcomes: • Needs assessment • Measurable objectives • Format of simulation • Clinical scenario or case • Fidelity • Facilitator/Facilitative approach • Briefing • Debriefing and/or feedback • Evaluation • Participant preparation • Test of the design Criterion

ANNEXURE 22: SCOPING REVIEW DATA MATRIX

No.	Author(s) Year of publication Title Setting	Study purpose/ objective/question	Population and Sample size	Study Methods/ Design	Key Findings
Student Elements and Related Best Practices					
1.	**Cant and Cooper (2017)** Use of simulation-based learning in undergraduate nurse education: An umbrella systematic review **Australia**	To conduct a systematic review to appraise and review evidence on the impact of simulationbased education for undergraduate/prelicensure nursing students, using existing reviews of the literature	Articles Total reviewed articles=25	Systematic review Data were extracted using the Joanna Briggs Institute methodology.	–Many reviews agreed on the key learning outcome of knowledge acquisition – Three of four high-quality reviews found that simulation supported psychomotor development. –Simulation statistically improves self-efficacy in a group of pretestposttest studies (p <=0.001). –Simulation improves student confidence levels, critical thinking, clinical judgement and competency.

2.	**Davis et al. (2018)** Effect of an Academic–Community Partnership Simulation Education Program on Quality and Safety Education for Nurses' (QSENs) Competency Domains for Bachelor of Science in Nursing Students **USA**	To examine the effect of a Simulation Education Program on Bachelor of Science in Nursing (BSN) and Medical Assistant (MA) students' attitudes regarding teamwork, collaboration, and patient-centred care.	Nursing students & and medical assistant students Sample size: 32 Bachelor of science in nursing (n = 11) and medical assistant students (n = 21)	Mixed methods study quasiexperimental pre/post design	—The findings support collaborative education using simulation and role-play as a best practice to promote QSEN competencies: teamwork, collaboration, and patient-centred care. —Both groups had significantly increased post-simulation Interprofessional Attitudes Scale total scores (N=32; p=.032) and teamwork, roles and responsibilities (p=.003), patientcenteredness (p=.043), and diversity and ethics (p=.025) subscales' scores. —Debriefing allowed the participants to reflect on the experience and enhance their learning through guided discussion about teamwork, collaboration, and patient-centred care.
3.	**Franklin et al. (2020)** A Randomised Trial of Multiple-Patient Simulation Preparation to Improve Novice Nurses' Competence and Self-Efficacy **USA**	To determine best practices for multiplepatient simulation (MPS) preparation and frequency to improve behavioural performance in nursing students.	Prelicensure novice nurses were enrolled in capstone clinical courses at two nursing schools. Sample size: 73	A multisite, blinded, randomised trial was conducted	—MPS helps novice nurses develop higher-order thinking skills, like managing multiple tasks, anticipating changes in patient status, and communicating with other providers. —Novice nurses need repeated MPS experiences to increase competent behavioural performance, and there is no relationship between competent behavioural performance and self-efficacy. —Expert Modelling (EM) videos are effective in improving multiplepatient care competencies. Participants who watched EM videos had improved priority setting, delegation, safe medication administration, communication using the Situation, Background, Assessment, and Recommendation framework, and time management.

					—EM videos may help learners understand concepts more effectively than other teaching methods, such as a didactic lecture. —Fidelity was maintained by scripting all dialogue and providing cues at specific intervals.

4.	**Harder et al. (2013)** Student perspective of roles assignment in high-fidelity simulation: An ethnographic study **Canada**	This article presents findings from a more extensive ethnographic study that examined the culture of learning among nursing students engaged in HFS as part of their undergraduate education.	Nursing Students Sample size: 84	Qualitative Ethnography approach Observations and interviews were carried out.	— Findings revealed that some instructors assigned students to particular roles while others allowed them to work in groups without any assigned roles. — Roles should be identified and adequately explained by the instructor at the outset of the simulation. — To enhance realism in the simulation, students must receive clear guidance about how to play their assigned roles. — Roles need to be realistic and reasonably challenging. Many instructors assign students to various nursing roles, including the primary and secondary nurse, medication nurse, and documentation nurse. — The students reported anxiety related to role-playing, particularly when assigned to non-nursing roles and felt pressured to perform.
5.	**Herlihy & Teel (2020)** Faculty Perceptions of Nursing Student Preparation in Undergraduate Clinical Simulation **USA**	To describe current practices in the student preparation phase of simulation in prelicensure nursing programs located in the western United States from the perspective of faculty currently teaching simulation.	Nursing Faculty Sample size: 8	Qualitative descriptive approach Semi-structured interviews Snowball sampling	The student preparation phase in simulation: — Elements of student preparation include (a) preparation activities, (b) orientation, and (c) pre-briefing. Students' preparation activities: — They included reading scholarly articles, reviewing procedures, answering general questions, completing prequizzes, watching manikin videos, reviewing and signing confidentiality agreements, completing prewritten simulation preparation materials from manikins or textbook companies, reviewing EHR, objectives, developing priorities for the simulated patient, familiarising themselves with a list of terms, mindfulness activities, skills drills and case-specific videos. — Resources include textbooks, web-based resources, and simulated electronic health records (EHRs). Student Orientation: — Introduction to simulation, the manikins, the environment, the rules and any technology (EHR, IV pumps, and monitors), roles, objective, patient situation and limitations, time — establish ground rules and the fictional contract The pre-briefing: — Occurred with students and faculty present together at the simulation lab. — Set the stage by identifying participant expectations of participants and the facilitator. — prebriefing should be structured, consistent and conducted immediately before the scenario with activities to promote an environment of integrity, trust and respect.

6.	**Oh et al. (2015)** The effects of simulation-based learning using standardised patients in nursing students: A meta-analysis **South Korea**	To evaluate the effect of simulation-based learning using standardised patients (SPs) on cognitive, affective, and psychomotor domain outcomes of learning in nursing students	Articles Total reviewed articles: 18	Systematic reviews and Metal analysis	The results suggested that: — Simulation-based learning using SPs appeared to have beneficial effects on the cognitive (d=0.85, p < .001), affective (d=0.42, p < .001), and psychomotor domains of learning (d = 1.06, p <.001). — Simulation-based learning using SPs might positively impact selfefficacy and learning motivation, which affects knowledge and clinical skill acquisition. In subgroup analysis, the use of SPs showed significant effects on knowledge acquisition (d=0.38, p=.05, I2=42%), communication skills (d=1.86, p<.001, I2=15%), self-efficacy (d=0.61, p<.001, I2=6%), learning motivation (d=0.77, p<.001, I2=0%) and clinical competence (d=0.72, p<.001, I2=0%).
7.	**Piot et al. (2021)** Effectiveness of simulation in psychiatry for nursing students, nurses and nurse practitioners: A systematic review and meta-analysis **France**	To evaluate the effectiveness of simulation training in psychiatry for nursing students, nurses and nurse practitioners.	Articles Total reviewed articles: 118	Systematic review and meta-analysis	— Behavioural outcomes showed significant differences for more than two-thirds of participants in RCTs and pre/post-tests and twothirds of non-RCT studies. Interventions included: — simulated patients (n = 55), role-plays (n = 40), virtual reality (n = 12), manikins (n = 9) and voice simulations (n = 9). — Role-play has a strong history in psychiatry, especially in teaching psychotherapy and psychiatry nursing education. — Considerations specific to psychiatry have emerged, including simulated patients' (SPs) ability to accurately portray mental disorders' cognitive, affective, and behavioural complexity.
8.	**Tyerman et al. (2019)** A Systematic Review of Health Care Presimulation Preparation and Briefing Effectiveness **Canada**	The objective of this review was to systematically examine the effectiveness of various presimulation preparation and briefing activities for healthcare professionals and students.	Articles Total reviewed Articles: 21	Systematic Reviews: Joanna Briggs Institute methodology and critical appraisal tools	Presimulation preparation activities: — Alternative presimulation preparation methods (e.g., concept mapping, expert modelling videos) offer additional benefits over traditional methods (e.g., lectures, assigned readings) or no preparation. Presimulation briefing: — Using pre-briefing activities versus no pre-briefing resulted in increased learner perceptions of confidence and learning and overall simulation effectiveness. — Presimulation preparation and briefing are separate and distinct components of simulation design, each associated with positive learning outcomes.

9.	**Wheeler and McNelis (2014)** Nursing student perceptions of a community-based home visit experienced by a role-play simulation USA	To evaluate the design and effectiveness of a role-play simulation of a home visit experience as a teaching tool	Nursing students Sample size: 144	A descriptive mixed-method study	—The results of this study support the use of role-play simulation in CHN education. Participants described their feelings that having peers portray the scenario characters was a benefit and that being able to self-select acting roles made them more comfortable and at ease among their peers.
10.	**Williams et al. (2017)** Simulation and mental health outcomes: a scoping review **Australia**	To map and determine the gaps in the literature on the impact of simulation as an educational approach to improve mental health care outcomes	Articles Total reviewed articles: 48	Five-stage Scoping review	Seven different types of simulation methods were identified, including SPs (n = 17), virtual reality (n = 9), role play (n = 6), manikins as patients (n = 4), computer simulation (n = 4), OCSE (n = 4) and voice simulation (n = 4).
Faculty/Lecturer/Educator/Facilitator-related Simulation Best Practices					
11.	**Alexander et al. (2015**) NCSBN Simulation Guidelines for Prelicensure Nursing Programs **USA**	This article presents those guidelines, evidence to support the use of simulation, and information for faculty and program directors on preparation and planning for using simulation successfully in their nursing programs	Guidelines/ Regulations	Literature Appraisal	Faculty and Program Preparation Checklist: —Are prepared using the INACSL Standards of Best Practice: Simulation. —Are prepared to create a learning environment that encourages active learning, repetitive practice, and reflection and to provide appropriate support throughout each activity —Are prepared to use facilitation methods congruent with simulation objectives/expected outcomes. —Sets clear objectives and expected outcomes. —Base simulation experiences on related educational theories, such as experiential learning theory. —Collects and retains evaluation data regarding the facilitator's effectiveness. —Utilises a standardised method of debriefing. —Has an adequate number of dedicated trained simulation faculty members —Has a plan for orienting simulation faculty members to their roles. —A needs assessment is used to determine what scenarios to use. —A tool for evaluating simulation-based learning experiences is designed based on the INASCL Standards of Best Practice: Simulation Evaluation Methods.

12.	**Beroz (2017)** A State-wide Survey of Simulation Practices Using NCSBN Simulation Guidelines **USA**	To identify faculty and program development needs in SBE across prelicensure nursing programs in one midAtlantic state using the NCSBN simulation guidelines as measured by checklists.	Simulation coordinators from prelicensure nursing programs Sample size:25	Descriptive mixed method study using a structured interview process	Faculty and program development needs: —All programs provide some means to educate faculty on the pedagogy of simulation. —Faculty provide an active learning environment for students and use repetitive practice. —Facilitation methods should be congruent with the objectives and meet program outcomes. —Use a theory-based debriefing method. —Develop a rubric to evaluate students' knowledge acquisition, skills, and attitudes

					—facilitators clearly communicate objectives and expected outcomes to the participant. —Most create a safe environment (89%), maintain fidelity (78%), and model integrity (85%). —Provide effective debriefing. —Assess the competence of facilitators during debriefing —Participant Assessment and Evaluation: All simulation programs use formative and summative evaluation, and no schools have high-stakes simulations. —Simulation evaluation practices include scenarios, facilitators, and student performance. —Valid/reliable tools are necessary when evaluating student performance for grades or course progression—the Program Assessment Survey for Simulation (PASS).

13.	**Boese et al. (2013)** Standards of Best Practice: Simulation Standard V: Facilitator **USA**	Facilitator standards	N/A	Standards	To achieve the desired outcomes of a simulation-based learning experience, the facilitator: –Clearly communicates the objectives and expected outcomes to the participant(s). – Creates a safe learning environment that supports and encourages active learning, repetitive practice, and reflection. –Promotes and maintains fidelity. –Uses facilitation methods appropriate to the participant's level of learning and experience. –Assesses and evaluates the acquisition of knowledge, skills, attitudes, and behaviours. –Models' professional integrity. –Fosters student learning by providing appropriate support throughout the simulation activity, from preparation through reflection. – Establishes and obtains evaluation data regarding the effectiveness of the facilitator and simulation experience.

					–Provides constructive feedback and debriefing with the participants.
14.	**Dale-Tam et al. (2021**) An Educational Intervention to Improve Simulation Facilitation by Nurse Educators in a Large Canadian Academic Hospital: A Mixed Methods Evaluation **Canada**	(i) To improve the quality of simulation facilitation and debriefing by NEs within the hospital during corporate nursing orientation (CNO).	Nurse educators Sample size: 21	Mixed methods	—Best practices in simulation-based education indicate that sessions should be facilitated by a trained simulation instructor, and a targeted curriculum titled Introduction to Simulation for Nurse Educators was developed. —Utilising a framework for debriefing assists novice and expert simulation instructors in facilitating a debriefing. —Using the Promoting Excellence and Reflective Learning in simulation (PEARLS) framework by Eppich & Cheng (2015) as a guide for debriefing was a consistent theme; providing feedback is essential to correct any knowledge or performance gaps that occurred in the simulation.

15.	**Franklin et al. (2013)** Standards of Best Practice: Simulation Standard IV: Facilitation **USA**	Simulation standards	Guidelines	Guidelines	—Identify facilitation methods that support simulation objectives. —Facilitation should be appropriate to the participant's level of learning and experience. Facilitators use feedback or debriefing to help participants meet the objectives and expected outcomes. Facilitation before the simulation experience: —Develop a list of expected behaviours to ensure learning objectives are met. —Plan when to support participants with cues during a scenario Facilitation methods during the simulation experience: —Providing cues to redirect the scenario and guide participants toward discovery. —Coaching participants to achieve the expected outcomes.
16.	**Herlihy (2022)** Faculty perceptions of preparation for teaching pre-licensure simulation: A qualitative descriptive study **USA** .	To explore faculty perspectives of nursing student preparation for simulation	Nurse educators Sample size: 8	Qualitative descriptive study	—Faculty training in simulation teaching strategies is key to delivering quality educational experiences to prelicensure nursing students. —Faculty training is an absolute necessity. —Continuing education and assessment of facilitation skills are necessary to maintain skills as an effective facilitator. —Simulation facilitators must have the education, skill, and ability to guide, support, and assist participants in achieving expected outcomes, —Faculty understands the importance of having objectives for the simulation. —Faculty realised that preparation enhances student performance.
17.	**Jeffries, Dreifuerst, Kardong-edgren & Hayden (2015)** Faculty Development when Initiating Simulation Programs: Lessons Learned From	This article focuses on the faculty development needed to maintain fidelity in initiating simulation programs' intervention,	Nursing schools Sample size: 10	Lesson learned/Discussion paper	—Development and education in simulation pedagogy are integral to a successful simulation program. —Education is needed to prepare faculty to integrate clinical simulations into their educational programs for optimal success. —When selecting simulations, faculty should consider the activities and encounters that correspond to the objectives of the nursing curriculum that learners need to experience.
	the National Simulation Study **USA**	implementation, and evaluation processes.			Faculty development in this study included: —creating instructional and reference materials —using standardised protocols for facilitating simulation scenarios, —conducting debriefings using Dreifuerst's (2012) Debriefing for Meaningful Learning© (DML), —evaluating student clinical performance using the Creighton Clinical Evaluation Instrument (CCEI), —evaluating debriefing effectiveness using the Debriefing Assessment for Simulation in Healthcare-Rater Version (DASH© RV) instrument.

18.	**Kostovich et al. (2020)** Establishing psychological safety in simulation: Faculty perceptions **USA & Canada**	To explore the nursing faculty's perceptions of psychological safety as it exists within a simulation learning environment for prelicensure nursing students.	Simulation nursing faculty Sample size: 37	Mixed methods with online survey data collection Purposive sampling	Faculty perceive that they play a role in establishing a psychologically safe learning environment during all three phases of a simulation experience: pre-brief, scenario, and debriefing: —The faculty provides a comprehensive orientation of the simulation experience to the students. Includes information about the environment, schedule of activities, the purpose of the experiences, expectations of students and faculty, and suspending disbelief. —Scenarios are purposefully designed to protect students emotionally while they participate in unfamiliar encounters. —Strategies are implemented throughout all three phases to facilitate student risk-taking as part of the learning process. —Faculty watch for verbal and non-verbal cues from students, signalling a potentially psychologically unsafe learning environment and intervening to protect them if necessary. —Faculty use pre-determined structured methods for conducting the simulation learning experience. —Faculty play the observer role, allowing the students to play out the scenario uninterrupted.
19.	**White (2017)** Keep Calm and Simulate On Faculty Experiences and Insights Into Implementing Best Practices in Simulation **USA**	To provide faculty with an insight into the organisation, preparation, and structuring of simulation experiences in consideration of INACSL best practices	n/a	Discussion paper	—Nursing faculty can maximise learning during simulation experiences through awareness and implementation of the INACSL Standards of Best Practice: Simulation. —Faculty must target practice and preparation to manage the simulated learning environment's complexity and optimise participants' learning opportunities. Faculty should utilise the available tools such as: —student preparation guides, —tools for organising pre-briefing, —scenario templates for cueing through the integration of simulation standards.
Designing Simulations Best Practices					
20.	**Arthur et al. (2013)** Quality indicators for the design and implementation of	To develop a set of quality indicator statements that would be applicable internationally and	International Experts in human patient simulation	Modified Delphi study Purposive sampling	The expert opinions of the participants were consistent with the literature review findings overall. In particular: —the need for clear objectives to guide all aspects of simulation design,

	simulation experiences: A Delphi study **Australia**	could be used to guide the development, implementation and evaluation of simulation experiences in undergraduate nursing curricula.	manikins (HPSM) Sample size:32		—the importance of adequately trained and skilled staff for simulation activities, —student preparation and orientation before simulation activities, —ability of staff to assist students in integrating theory into practice during debriefing and curriculum integration. —Educators should identify specific objectives for each simulation session and select the appropriate scenario, design features, and equipment. —Participant consensus was that high-fidelity manikins are not required for all simulation activities. —The importance of adequate staffing and staff training in simulator technology, scenario design, and debriefing techniques was ranked very high. —Providing some form of medical record was an important component of environmental fidelity. —The importance of repetition of activities to reinforce learning was mentioned.
21.	**Gore and Thomson (2016)** Use of Simulation in Undergraduate and Graduate Education **USA**	This article provides readers with an overview of simulation use in undergraduate and graduate nursing education.	N/A	Discussion paper	—The focus of simulation is to improve patient safety, communication, and the ability of the student to think and act as a nurse or advanced practice nurse. —All simulation experiences should be designed with clearly identified objectives. —The simulation designer must select the appropriate level of fidelity, facilitation, and simulation scenario. —High-quality simulations by trained faculty facilitators and debriefers can increase our students' immersive learning opportunities. —A facilitated debriefing should follow all learning experiences. —Embrace the INACSL Standards of Best Practice: Simulation and learn facilitation and debriefing strategies (standards IV and VI) as they apply to teaching and learning. Debriefing strategies start with creating a safe, confidential environment that protects learners from feelings that might seriously damage their sense of self-worth and self-confidence while

22.	**Hayden et al. (2014)** The NCSBN National Simulation Study: A Longitudinal, Randomised, Controlled Study Replacing Clinical Hours with Simulation in Prelicensure Nursing Education **USA**	To provide BONs with evidence on nursing knowledge, clinical competency, and the transferability of learning from the simulation laboratory to the clinical setting.	Undergraduate nursing students Sample size: 666	Longitudinal, Randomised, Controlled Study	Conditions for substituting traditional clinical experience with simulation include: —Faculty members who are formally trained in simulation pedagogy, adequate faculty members to support the student learners, subject matter experts who conduct theory-based debriefing, and equipment and supplies to create a realistic environment. A way to ensure a high-quality simulation is to incorporate best practices into a simulation program; they include: — terminology, professional integrity of the participant, participant objectives, facilitation, facilitator, the debriefing process, and participant assessment and evaluation

					Simulation scenarios should follow the NLN/Jeffries Simulation Framework, which consists of the following: —Clear learning objectives and problem-solving components were built into the scenarios, fidelity was appropriate for the learning objectives, and structured debriefing followed each scenario. —Involved medium/high-fidelity manikins, standardised patients, role-playing, skills stations and computer-based critical thinking simulations. —Students were assigned roles during the simulation scenarios, including being staff nurses, family members, and observers. Debriefing: — Debriefing was led by a study team member using the Debriefing for Meaningful Learning© method (Dreifuerst, 2010). Clinical competency was evaluated using three instruments: —The Creighton Competency Evaluation Instrument (CCEI), —the New Graduate Nurse Performance Survey (NGNPS), the Global Assessment of Clinical Competency and Readiness for Practice.

23.	**INACSL Standards Committee (2016)** INACSL standards of best practice: Simulation[SM] Simulation design **USA**	Simulation standards	N/A	Guidelines	—Perform a needs assessment to provide the foundational evidence of the need for a well-designed simulation-based experience. —Construct measurable objectives. —Structure the format of a simulation based on the purpose, theory, and modality for the simulation-based experience. —Design a scenario to provide the context for the simulation-based experience. —Use various types of fidelity to create the required perception of realism. —Maintain a facilitative approach that is participant-centred and driven by the objectives, participant's knowledge or experience level, and the expected outcomes. —Begin simulation-based experiences with a pre-briefing —Follow simulation-based experiences with a debriefing or feedback session. —Include an evaluation of the participant(s), facilitator(s), the simulation-based experience, the facility, and the support team. —Provide preparation materials and resources to promote participants' ability to meet identified objectives and achieve the expected outcomes of the simulation-based experience. Pilot test simulation-based experiences before full implementation.
24.	**Lioce et al. (2015)** Standards of Best Practice: Simulation	Simulation Standards	N/A	Discussion paper	Simulation design should consider the following elements: Needs assessment; Measurable objectives; Format of simulation; Clinical scenario or case; Fidelity; Facilitator/Facilitative approach; Briefing; Debriefing and/or feedback; Evaluation; Participant preparation; Test of the design

	Standard IX: Simulation Design **USA**				

25.	**McDermott et al. (2017)** Using the INACSL Simulation™ Design Standard for Novice Learners **USA**	To discuss using the INACSL Simulation Design Standard (SDS) to create a novice simulation experience for sophomore nursing students.	Sophomore nursing students Sample size: 143	Pilot study	Need assessment: — Student skills learning gaps were noted during lectures and laboratory teaching. Measurable learning objectives: — Were designed to reflect course objectives. Format of SBE: —It was important to consider the level of the simulation learner. Experiential learning and constructivist learning principles guided the development of this SBE. Clinical scenario: — Prewritten commercial scenarios that match the learning objectives and goal of the SBE to ensure better standardisation of the experience. Fidelity: A high-fidelity male manikin was used for this SBE in a patient room that mimics an actual patient room. Used a manikin that can simulate breathing and lung sounds, and interact with the students, a form of high-fidelity simulation Pre-briefing: –On the day of the SBE, students were oriented to the manikin and the formative simulation environment. The fictional contract, rules of conduct, and the idea of a safe learning environment, as well as the logistics of the SBE, were discussed with students. Facilitator approach: experienced and certified simulation educators served as facilitators. Before facilitating the scenarios, they met several times, reviewed the SBE goal and objectives, and discussed methods for facilitation and the specific tasks that students should perform in the scenario. Pre-briefing: On the day of the SBE: –Students were oriented to the manikin and the formative simulation environment. –Fictional contracts, rules of conduct, a safe learning environment, logistics, and objectives were discussed with students. – Students were allowed to take vital signs and listen to lung sounds on the manikin. –All equipment was demonstrated, and elements of the SBE that could not be simulated were explained to students. Debriefing and feedback: — Experienced Certified Healthcare Simulation Educators (CHSE) facilitators led the reflective debriefing session.

					Debriefing frameworks: — The Debriefing for Meaningful Learning (DML) (Dreifuerst, 2012) — Promoting Excellence and Reflective Learning in Simulation Framework (PEARLS). Evaluation: — The C-CEI© [Cronbach alpha >0.90 (Hayden et al., 2014) was used to provide guided feedback to students post scenarios. — Students also completed a post-simulation survey known as the Simulation Perspective Survey [(Cronbach's alpha 0.83) (Howard et al., 2011)]. — Pilot testing: a pilot test was completed with a few junior students who worked as laboratory assistants in the simulation centre.
26.	**Moabi & Mtshali (2021)** Nursing education institutions' readiness to fully implement simulation-based education in Lesotho **Lesotho and South Africa**	To assess the readiness of the four private nursing education institutions in Lesotho to implement simulationbased education and to describe facilitators and barriers to implementing simulation-based education.	Nurse educators Sample size: 63	A quantitative, descriptive design Survey questionnaire	Facilitating factors for implementing simulation-based education: —Simulation laboratories need to be manned by qualified personnel, and the management of the institutions needs to create an enabling environment for implementing simulation-based education. —Simulation learning is part of clinical practice and must be allocated time within the clinical hours. —Integrating simulation into the curriculum can enhance defined needs and support for change. —Sufficient resources to support simulation personnel and access to quality technology. For sustainability practices to embed culture, management should motivate nurse educators to implement simulation-based education and supportive policies.

27.	**Shaw-Battista et al. (2015)** Successes and Challenges of Interprofessional Physiologic Birth and Obstetric Emergency Simulations in a Nurse-Midwifery Education Program **USA**	This article describes childbirth simulation design and implementation within the nurse-midwifery education program at the University of California, San Francisco.	Not specified	Discussion paper	Best practices in simulation development and implementation were incorporated, including: —All facilitators received training in adult learning principles and effective debriefing. —Curriculum revision grounded in needs assessment, case- and event-based clinical scenarios, optimisation of fidelity, and ample time for participant debriefing. —Simulations' trainees, actors, and faculty were used as confederates to increase fidelity, learner participation, and the utility of debriefings. —Participants without an active role in the scenario were instructed to watch for specific actions and occurrences, such as time elapsed between a clinical event and interprofessional consultation or instances of closed-loop communication, and to provide this feedback during debrief discussions. —Fidelity enhancement included using props and equipment that mimic real clinical settings. —Paying attention to psychological and sociological fidelity by allocating appropriate participant roles and using confederates.
					—Domains of fidelity have been identified as equipment, environmental, and psychological. —Before simulations, the facilitators conducted a prebrief discussion, oriented learners to the environment, and assigned roles, and described expectations for engagement and learning, confidentiality, and other aspects of psychological safety. —Trainees completed pre/postsimulation assessments containing questions about teamwork and communication. —Simulation scenarios are scripted with evolving clinical conditions that require interprofessional consultation, collaboration, or transfer of care.
Prebriefing related Best Practices					
28.	**Brennan (2022)** The impact of selfefficacy based prebriefing on nursing student clinical competency and selfefficacy in simulation: An experimental study **USA**	To examine the effects of the SelfEfficacy Pre-briefing Model (SEPM) on nursing student selfefficacy and clinical competency.	Senior Bachelor of Science in Nursing students Sample size: 66	An experimental design with group randomisation	—SEPM is a pre-briefing method that promotes nursing students' clinical competency and self-efficacy in simulation. —The experimental group had statistically significantly higher selfefficacy ($p = .001$) and clinical competency ($p < .001$) as compared to the control group. No significant relationship was noted between self-efficacy and clinical competency ($p = .207$). —Pre-briefing is essential in the simulation process and in promoting student outcomes.

29.	**Chamberlain (2015)** Pre-briefing in Nursing Simulation: A Concept Analysis Using Rodger's Methodology **USA**	To determine suitable material for developing the concept analysis	Articles Total reviewed articles=23	Literature search Rodger's concept analysis approach	Common aspects of pre-briefing: —Orientation to the mannequin and equipment —Students need to complete preparatory work —Inform students about crucial components of the simulation learning experience, such as debriefing, their roles during the scenario, and establishing psychological safety. —Identifying simulation learning objectives
30.	**INACSL Standards Committee, McDermott, Ludlow, Horsley & Meakim (2021)** Healthcare Simulation Standards of Best Practice™ Pre-briefing: Preparation and Briefing **USA**	Healthcare Simulation Standards of Best Practice for prebriefing: preparation and briefing	INACSL Standard Committee and Simulation Experts	Discussion paper	—Pre-briefing is a process which involves preparation and briefing. —It ensures that simulation learners are prepared for the educational content and know the ground rules of the simulationbased experience. —It establishes psychological safety. Student Preparation: —Based on the needs assessment and purpose of the experience, —preparation materials are developed and meet the scenario objectives. Preparation activities may include: —assigned readings or audiovisual materials, concept mapping or care planning exercises, review of patient health record/patient report, case studies, observation of a model of a simulated case,

					completion of a pre-test or quiz, review of medications, practice skills to be used in the simulation-based experience, lecture or other didactic lessons, clinical preparation sheet completion, discussion of the simulated patient, virtual simulation activities. —Preparation materials are delivered before and on the day of the simulation-based experience. Briefing: —Before the simulation-based experience, the simulationist conveys information to learners regarding expectations, the agenda, and the logistics for the experience. —Conduct a structured orientation to the simulation-based learning environment, including the modality.

31.	**INACSL Standards Committee, McMahon, Jimenez, Lawrence & Joyce (2021)** Healthcare Simulation Standards of Best PracticeTM Pre-briefing: Preparation and Briefing **USA**	Pre-briefing: Preparation and Briefing	INACSL Standards Committee	Discussion paper	—The simulationist should be knowledgeable about the scenario and competent in concepts related to pre-briefing. —Pre-briefing should be developed according to the purpose and learning objectives of the simulation-based experience. —The experience and knowledge level of the simulation learner should be considered when planning the pre-briefing. —Expectations of clinical work are made possible in and through the participants' orientation to the similarities and differences between the simulation and the situation.
32.	**Ludlow (2021)** Pre-briefing: A PrincipleBased Concept Analysis **USA**	To develop a phasebased theoretical definition of prebriefing that integrates the three domains of learning into three elements of pre-briefing	Articles Total reviewed articles: 41	Systematic review Principle-based concept analysis	The findings of the concept analysis were used to develop a phase-based theoretical definition of pre-briefing that integrates the three domains of learning into three elements of pre-briefing: a) The preparatory phase (cognitive domain) b) The orientation phase (psychomotor) c) The pre-briefing phase (affective) —Pre-briefing was linked conceptually to learning theories such as Kolb's Experiential Learning theory, adult learning theory, Bandura's social cognitive theory, situated cognition, and brainbased education in preparation to facilitate learning.
33.	**McDermott (2016)** The Pre-briefing Concept: A Delphi Study of CHSE Experts **USA**	(a) To determine expert simulation educators' perspectives of the pre-briefing role to SBL (b) To develop guidelines for simulation educators in preparing participants for simulation learning.	Certified Healthcare Simulation Educators (CHSE) Sample size: 59	A three-round modified electronic Delphi design	—Findings suggested that three phases of pre-briefing should be considered as roles of the educator: (a) planning, (b) briefing, and (c) facilitating. —Simulation educators are vital in preparing simulation participants for a successful SBL experience. —The simulation educator should consider the purpose and learning objectives of the SBL (89.1%) and learner characteristics (89%97%). —Activities during the briefing phase included orientation to the manikins (100%), equipment (100%), conditions of the scenario (97.3%), the purpose of the SBL (86.5%), setting the tone and

					expectations by establishing the fiction contract, a psychologically safe environment for learning, and the logistics of the (83%-91%). —A briefing script would provide consistent, standardised information (86%). —Pre-briefing allows the simulation educator to determine gaps in learner knowledge before the SBL (70%). —Pre-briefing is essential for learner success in SBL (100%) and successful debriefing (81%) Guidelines for simulation learners: —Assume responsibility and accountability for their learning in simulation. Complete all preparation activities; Participate with an open mind and positive attitude; Maintain confidentiality and respect for peer learning.

34.	**McDermott (2020)** Pre-briefing: A Historical Perspective and Evolution of a Model and Strategy (Know: Do: Teach) **USA**	To discuss the historical aspects of pre-briefing research and study from its infancy to the current body of work	Literature	Discussion paper	—The pre-briefing model consists of three phases: planning, briefing, and facilitating. —It aims to set the stage for a scenario and assist participants in achieving scenario objectives. —Activities in pre-briefing include an orientation to the equipment, environment, manikin, roles, time allotment, objectives, and patient situation, delineating simulation expectations. —The briefing component included widely accepted activities establishing respect, expectations, and the fiction contract. —Pre-briefing is planned by the simulation educator and/or the content expert. Planning: —Items to be determined during the planning phase include the level and previous knowledge, learning objectives, and preparation for the participants. —Presimulation/pre-briefing learning activities are assigned at the discretion of the simulation educator and are planned to help the participant successfully achieve the simulation learning objectives. —They may be provided before or on the same day as the simulation day. Pre-briefing activities: — Include orientation for the participant to the simulated environment before engaging in the scenario, manikins, equipment and the logistics of performing in the scenario. During the briefing: — Simulation facilitators set the tone and expectations for the simulation experience, including discussing the simulation agenda and logistics. —Prepare a briefing script so that all participants consistently hear the same information. —The student version short form of the Debriefing Assessment for Simulation in HealthCare© (DASH) tool is used to help assess and evaluate the simulation scenarios (Simon, Raemer, & Rudolph. 2010).

					—The prebriefing model (Know: Do: Teach) was developed to facilitate student preparation for the simulated learning experience in an active and immersive method.

35.	**Page-Cutrata & Turk (2017)** Impact of pre-briefing on competency performance, clinical judgment and experience in simulation: An experimental study **Canada & USA**	To examine the intervention of structured pre-briefing for its effect on nursing students' competency performance, clinical judgment and their perceived pre-briefing experience	Baccalaureate nursing students enrolled in a fourth-year medical-surgical course Sample size (n= 76)	An experimental grouprandomised design Convenience sample	—This study suggests that educators may consider embedding structured pre-briefing activities in all levels of nursing programs to improve competency performance and clinical judgment among students. —Structured pre-briefing strongly affected the competency performance of participants during the scenario. —Clinical judgment scores were significantly greater for the experimental group who received structured pre-briefing than for the control group U= 128.5, Z = −6.2, p b 0.001. —The perception of the pre-briefing experience was greater for the experimental group who received structured pre-briefing than for the control group=281.0, Z=−4.54, p b 0.001.
36.	**Rutherford-Hemming et al. (2019)** Guidelines and Essential Elements for Pre-briefing **USA**	This article reports the current established prebriefing standards and guidelines.	Articles Reviewed articles: 9	Literature Search	—Pre-briefing can provide learners with the preparation needed to decrease anxiety and prepare for a successful simulation experience. Standards and guidelines on the established essential elements to include in a pre-briefing are: —Setting the scene includes psychological safety, a fiction contract, confidentiality, communication, and logistics. —Providing the expectations of the simulation facilitator and participant (student) expectations. —The simulation scenario is another area that should be part of the pre-briefing. Here, the facilitator will provide participants with the backstory for the simulation scenario. Some facilitators may assign roles to participants. Simulation facilitation states that clear guidelines for all assigned roles should be provided to participants. —Part of the pre-briefing needs to include evaluation information. The participant evaluation should be directed by the objectives and guided by the type (formative, summative, or high stakes), timing, case overview, and limitations of the simulations should be discussed in the prebrief. —Pre-briefing with SPs may also help ensure a successful simulation experience for the learner. Standardised patient best practices include formal case training and review with an SP trainer on each case to ensure quality, consistency, accuracy of portrayal, and demonstrated understanding of the role.
Simulation Fidelity Best Practices					
37.	**Brady et al. (2015)** The effectiveness of varied levels of	To evaluate the effectiveness of varying levels of fidelity on simulated	Midwifery students Sample size: 69	Randomised three-arm intervention trial	—Progressive (high-fidelity) and medium-fidelity simulation yield better outcomes than low-fidelity simulation, where resources are constrained; medium-fidelity equipment, such as a life-sized

	simulation fidelity on the integrated performance of technical skills in midwifery students - A randomised intervention trial **Australia**	learning experiences and identify which best contributes to integrated and global clinical skills development in midwifery students.			poster, can produce effective learning experiences for midwifery students. —There was a statistically significant difference in the mean total Global Rating Scale (GRS) score between at least two of the three groups (p = 0.009). —Post-hoc testing for Rater A revealed that the progressive fidelity group was statistically different from the low fidelity group (p = 0.010) and the medium fidelity group (p = 0.048). —There was a statistically significant difference in the mean total Integrated Procedural Performance Instrument (IPPI) score between at least two of the three groups (p = 0.017).
38.	**Grota et al. (2020** Using International Nursing Association for Clinical Simulation and Learning Standards to Evaluate the Rigor of High-Fidelity Simulation Learning Experiences **USA**	To share an approach applying The International Nursing Association for Clinical Simulation and Learning (INACSL) Standards to support substituting two-hour traditional clinical with one hour of high-quality, rigorous simulation or SLE as determined by faculty governance.	SLE Courses Total reviewed:8	Featured article	—Using the INACLS Standards promotes the incorporation of excellent educational principles into the SLE. —The simulation learning experiences (SLE) must be based on a defined learning need or gap in the curriculum. —The SLE rubric also requires an evaluation of the performance objectives driven by a need assessment. —The SLE must include pre-briefing and may consist of preassignments to ensure the student is prepared with the knowledge needed to make accurate decisions. —A plan for debriefing, one of the essential components of the SLE, needs to be based on a conceptual model such as Promoting Excellence and Reflective Learning in Simulation (Eppich & Cheng, 2015). —Another strength of the SLE evaluation rubric is that it requires students and faculty to evaluate the effectiveness of 2:1 SLE.

39.	**McFaden (2020)** Simulation Realism, contextual fidelity, and unintended lessons **USA**	To examine common simulation practices that can create unintended student learning	Pre-licensure registered nursing students total participants=65/ 188 The majority of the respondents had several years of simulation experience.	Survey study	—Simulation quality depends on the simulated experience's design and the facilitators. —Realism within a simulation scenario is achieved by the fidelity created. —High-fidelity simulators can predispose a simulation designer to create reactive simulation scenarios. —Creating appropriate clinical context and proactive simulation also requires creating an unfolding patient history. Without this information, a student in a simulation is simply reacting to a snapshot situation versus identifying concerning trends and then intervening to prevent potential problems. While —Fidelity should be "the accurate representation through cues and stimuli" of a clinical experience.

40.	**Paige & Morin (2013)** Simulation Fidelity and Cueing: A Systematic Review of the Literature **USA**	This article reports a systematic literature review of attributes and definitions of fidelity and cueing.	Articles Total reviewed articles:13	Systematic Review	—Results indicate fidelity is a multidimensional concept forming a matrix comprising physical, psychological, and conceptual dimensions. —Cueing comprises reality and conceptual cues, with the mode of delivery enacted via equipment, environment, or patient and role characters.

41.	**Reibel et al. (2019)** Creating a Simulation Experience to Promote Clinical Judgment **USA**	To present the development and application of a highfidelity simulation experience to promote nursing students' clinical judgment in an accelerated Bachelor of Science in Nursing (BSN) program.	Not specified	Discussion paper	—High-quality simulation scenarios promote nursing students' clinical judgment skills. —A course lecturer facilitates the process of scenario development. —A needs assessment was performed to provide evidence of the need for the DKA simulation-based experience. The need assessment findings guided the simulation scenario's design and writing to promote nursing students' ability to meet objectives. —Simulation experts assisted the course coordinator with incorporating cues in the scenario. —Thorough student preparation and orientation to simulation were essential components of the simulation learning experience. —Students were assigned roles to perform in the simulation. Students were paired and assigned to collaborate with their peers in the primary nurse role while caring for the patient with DKA; others were assigned the observer role and completed a peer evaluation of the performances using the QSEN competencies. —The student observers actively participated in the debriefing session by sharing observations and providing constructive feedback to their peers. —Debriefing was conducted immediately after the DKA simulation using the (PEARLS) debriefing technique. —The Lasater Clinical Judgment Rubric (LCJR)- for student selfassessment and the Quality and Safety Education for Nurses (QSEN) competencies were used to promote clinical judgment. —
42.	**Rystedt & Sjöblom (2012)** Realism, authenticity, and learning in healthcare simulations: Rules of relevance and irrelevance as interactive achievements **Sweden**	To contrast, two different simulators to explore the requirements needed to establish and maintain simulations as authentic representations of clinical practice.	Case studies Sample size: 2	Ethnomethodology	Requirements needed to establish and maintain simulation authentic: —It involves an orientation to the relevant similarities with work and, simultaneously, the ruling out of irrelevant dissimilarities. In doing so, the participants rely on established professional practices to construe the situation. —Moreover, the realism of the simulation is maintained through the participants' mutual orientation to the moral order of good clinical practice and a proper simulation.
43.	**van Vuuren, Seekoe & Goon (2018)**	To determine the perceptions of nurse educators regarding	Nurse educators and	A quantitative descriptive research design	—The findings indicate that everyone is at the same level regarding technology readiness; however, it does not play a significant role in using HFS.

	The perceptions of nurse educators regarding the use of high-fidelity simulation in nursing education **South Africa**	the use of high-fidelity simulation (HFS) in nursing education at a South African private nursing college	clinical training specialists Sample size: 79		—These findings support the educators' need for training to prepare them to use simulation equipment adequately. —Most respondents agreed on the benefits of high-fidelity simulators compared to low or medium-fidelity simulators. However, the "need for ongoing training and lack of time" was a limiting factor in using high-fidelity simulators.
Debriefing Best Practices					
44.	**Brown et al. (2018)** Evaluation of Simulation Debriefing methods with interprofessional learning **USA**	The purpose of this study was to determine the best practices in IP simulation debriefing by comparing different debriefing models	Nursing students (n = 110), respiratory therapy (n = 16), and medical students (n = 9)	2-group quasiexperimental cohort comparative design	—We measured the effectiveness of debriefing with the Debriefing Assessment for Simulation in Healthcare Student Version© (DASH-SV) survey, Cronbach alpha internal validity (α = .95). —We found statistically significantly higher scores for in-person (M = 5.79) compared to teledebriefing (M = 4.96, p < .001). Single debriefer (M = 6.09) compared to IP co-debriefer DASH scores (M = 5.93) for all scenarios were not significantly different (p = .059). The results suggest that teledebriefing may provide a solution for simulation programs with off-site or rural learners. A single inperson debriefing can be equally effective as co-debriefing for IP students.
45.	**Decker et al. (2013)** Standards of Best Practice: Simulation Standard VI: The Debriefing Process **USA**	Simulation standards	Standards Committee	Guidelines	Simulation-based learning experiences should include a planned debriefing session to promote reflective thinking. Debriefing promotes understanding and supports the transfer of knowledge, skills, and attitudes, focusing on best practices to promote safe, quality patient care. An effective debriefing process includes the following: —Facilitated by a person(s) competent in the process of debriefing. —Conducted in an environment conducive to learning and supports confidentiality, trust, open communication, self-analysis, and reflection. —It is facilitated by a person(s) who observed the simulated experience. —Based on a structured framework for debriefing. —Debriefing should be congruent with the participants' objectives and outcomes of the simulation-based learning experience.

46.	**Gordon (2017)** Debriefing Virtual Simulation Using an Online Conferencing Platform: Lessons Learned **USA**	To examine the feasibility of offering students an immersive clinical practicum experience conducted	Family nurse practitioner students	Discussion paper	—Schedule debriefing sessions to occur within the shortest amount of time after completing the learning activities. —Implement the Debriefing Assessment for Simulation in Healthcare Score Sheet© and the Debriefing Assessment for Simulation in Healthcare Instructor Version© for evaluative purposes. Both tools are designed to assist in evaluating and developing. —The DML was the conceptual model for debriefing following the simulation in the Virtual Learning Lab (VLL). Faculty roles and responsibilities during debriefing:
					— provide psychological safety to participants by being trustworthy, respectful, and confidential, — provide honest feedback and portray a positive demeanour. — facilitate student reflection on events in the scenario and vary the role of facilitation by level. — develop debriefing skills to enhance students' perception of the experience and empower them to know that they can improve and provide honest feedback. Student roles and responsibilities during debriefing: — reflect on personal strengths, limitations, beliefs, prejudices, and values. — discuss improvement goals and strategies. — reflect upon experience and provide comments and suggestions to peers. — discuss the translation of virtual learning to actual clinical practice

47.	**Hall & Tori (2017)** Best Practice Recommendations for Debriefing in SimulationBased Education for Australian Undergraduate Nursing Students: An Integrative Review **Australia**	To establish best practices for debriefing in simulation using highfidelity mannequins and standardised patients.	Articles (Nursing students) Total reviewed articles size: 21	Integrative review	—Debriefing is an essential component of simulation-based learning —Types of debriefing (video-assisted and facilitator only) —Debriefing follows immediately after the simulation-based learning activity —Simulation debriefing should be done by the person who observes the clinical experience —The debrief facilitator receives formal training, feedback, assessment, and ongoing support from experts to ensure competency. —A confidential, safe environment ensures that debriefing is effective for the learner. —Debriefing should be based on the pre-set learning outcomes. —Debriefing follows a constructivist teaching strategy, focusing. Debriefing should be based on a structured framework: — Debriefing for meaningful learning (DML) — The 3D models. The Lasater Clinical Judgment has an interrater reliability of 0.97
48.	**Sawyer et al. (2016)** More Than One Way to Debrief: A Critical Review of Healthcare Simulation Debriefing Methods **USA**	This critical review examines the timing, facilitation, conversational structures, and process elements used in healthcare simulation debriefing.	Articles Not specified	Critical review approach	The timing of the debriefing simulation event: — post-event and — within-event The conversational guide: — can be a facilitator (facilitator-guided) — can be the participant/learner (self-guided). The debriefing structure/methods: —debriefing with good judgment; debriefing with meaningful learning (DML); 3Ds; GAS model; diamond debriefing method; and the PEARLS; TeamGuided, AAR) Essential elements for the debriefing process:

					—Establishing debriefing rules, sharing a mental model, addressing learning objectives, using open-ended questions, and using silence. Debriefing adjuncts: —Using a codebriefer, a debriefing script, and a video review. Conversational techniques/educational strategies: —learner self-assessment, directive performance feedback, and focused facilitation techniques Facilitation of simulation-based activities requires faculty training in debriefing and simulator logistics. The roles of the facilitator(s) are to: —Act as a conversational guide, ensure that the relevant issues (e.g., learning objectives), which occurred during the simulation event or were identified a priori, are discussed to ensure that the debriefing conversation flows smoothly
49.	**Verkuyl et al. (2020)** Exploring Debriefing Combinations After a Virtual Simulation **Canada**	This study explores the following debriefing practices: self-debrief only, selfdebrief followed by a small-group debrief, and self-debrief followed by a largegroup debrief.	First-year nursing students Sample size: 19	The focus group discussion, Semi-structured interview guide Convenience sampling	—Participants commented on timing, saying they predominately completed the self-debrief immediately after doing the virtual gaming simulation (VGS) —The self-debrief was only guided by reflection questions, which made participants remember the VGS experience and be aware of personal performances. —The self-debrief questions were a guided reflection based on the 3D framework for debriefing related to the prenatal VGS. —Debriefing with an instructor unknown to them [learners] was more difficult for participants, who noted that this affected the depth of their group discussion. —Smaller debrief groups promote participation compared to larger group debriefs
Simulation Evaluation Best Practices					
50.	**Guimond et al. (2019)** Evaluation of an unfolding obstetric experience simulation in an undergraduate nursing program **USA**	To describe the development, implementation, and evaluation of the simulated obstetric clinical experience	Junior-level nursing students Sample size:53	Quantitative approach Pre/post-design Convenience sample	Evaluation: student competencies were evaluated using an obstetric nursing self-efficacy instrument questionnaire with split half-reliability scores calculated as 0.85, 0.96, and 0.92 in a pre/post-test study. Students improved self-efficacy and communication skills scores after repeating the simulation with standardised patients.

51.	**Liaw et al. (2014)** Easing student transition to graduate nurse: A simulated	To describe the development, implementation and evaluation of a simulation program	Final-year student nurses Sample size: 94	A prospective, quasiexperimental pre-test and post-test design	Types of evaluation: —A formative evaluation —a summative evaluation Evaluation of SIMPLE Program effectiveness:

	professional learning environment (SIMPLE) for final year student nurses **Singapore**	known as SIMulated Professional Learning Environment (SIMPLE) in preparing the final year student nurses for their clinical practicum in transition to graduate nurse practice.			—The student nurses demonstrated a significant improvement (t = 12.06, p b 0.01) on the post-test score (mean = 117.21, SD = 15.17) from the pre-test score (mean = 97.86, SD = 15.08) for their perceived preparedness towards their clinical practicum in transition to graduate nurse practice. —The students indicated that using simulated patients has heightened simulation realism and allowed them to practice their communication skills. Evaluation instrument: —The Preparedness for Hospital Practice Questionnaire (PHPQ) consists of five domains: self-directed learning, confidence, management, interprofessional skills, and collaboration. Cronbach's alpha reported from our study for each domain ranges from 0.83 to 0.94. The four-level evaluation model Kirkpatrick (1994) developed was used as a guideline to evaluate the SIMPLE program.
52.	**INACSL Standards Committee (2016)** INACSL Standards of Best Practice: SimulationSM Participant Evaluation **USA**	Simulation standards	INACSL Standards Committee	Guidelines	Simulation-based experiences support the evaluation of knowledge, skills, attitudes, and behaviours demonstrated in the cognitive (knowledge), affective (attitude), and psychomotor (skills) domains of learning. Participant evaluation: —Formative evaluation of the participants fosters personal and professional development to assist the participant in progressing toward achieving objectives or outcomes. —Summative evaluation measures outcomes or achievement of the objectives discretely, often at the end of a program of study. High-stakes evaluation is an assessment with major implications or consequences based on the result or the outcome (such as merit pay, progression or grades).

53.	**Reid et al. (2020)** High-Fidelity Simulation and Clinical Judgment of Nursing Students in a Maternal–Newborn Course **USA**	To explore the difference in clinical judgment between nursing students who participate exclusively in simulation and those who participate exclusively in acute care hospital-based clinical experiences in a maternal–newborn clinical course.	Students enrolled in the maternal–newborn clinical course Sample size: 62	Survey: Twogroup, the posttest study design was implemented	—The Lasater Clinical Judgment Rubric (LCJR) (Lasater, 2007) was used to measure nursing students' clinical judgment after completing simulation or hospital-based clinical experiences. —There was no statistical difference in clinical judgment scores between the simulation and hospital-based clinical groups (t = −1.056, P =0.295
54.	**Sando et al. (2013)** Standards of Best Practice: Simulation Standard VII: Participant Assessment and Evaluation **USA**	Simulation standards	Standards Committee	Guidelines	To promote valid and reliable results, determine the participant assessment or evaluation type before the simulation-based experience. Participant assessment or evaluation may include the following: — Formative assessment. — Summative evaluation. — High-stakes evaluation.
55.	**Zitzelsberger et al. (2017)** Exploring Simulation Utilisation and Simulation Evaluation Practices and Approaches in Undergraduate Nursing Education **Canada**	Investigated simulation utilisation and simulation evaluation practices and approaches employed among undergraduate nursing education programs in Ontario, Canada, using a mixed methods approach	Education institutions Sample size: 36 (14 universities along with 22 college partners)	Mixed methods approach Data was collected through an online survey.	—75% of participants reported the consistent employment of a standardised tool for summative evaluation, followed by highstakes evaluation (62.5%), formative evaluation (58.8%), and, finally, remedial evaluation (45.5%). —Most participants (90%) also considered the evaluation of personnel (e.g., faculty, staff, educators, facilitators) directly involved in simulation utilisation to be very important. A variety of evaluation practices applied to examining the simulation itself (e.g., theoretical constructs, linkages to learning outcomes, evaluative tools such as rubrics and checklists, prebriefing methods, and debriefing methods.
Innovations in Simulation					

56.	**Aebersold (2018)** Simulation-based learning: No longer a novelty in undergraduate education **USA**	To describe the background, theoretical basis, and current simulation uses; report on simulation effectiveness in nursing; share educational strategies to enhance effectiveness; and consider simulation methods and feedback and debriefing strategies.	Not specified	Discussion paper	Theoretical Basis for Simulation: — Grounded in learning theories based on constructivism, — Kolb's Experiential Learning Theory (ELT) — NLN/Jefferies Simulation Theory (Jeffries Studies demonstrated that simulation positively impacts knowledge acquisition, psychomotor skills, self-efficacy, satisfaction, confidence, and critical thinking skills. Education strategies to enhance the effectiveness of simulation learning: — Curricular Mapping and Integration — Simulation Outcomes — Selecting the appropriate simulation methods — Simulation feedback and debriefing The scenario components include the following: — the learning objective, — the patient information — actor scripts as needed, — information for the high-fidelity simulator, — a timeline for the unfolding of the scenario, — cues Faculty need to learn to effectively design, facilitate, and debrief simulation-based experiences to meet objectives for learning experiences.
					The most common simulation methods utilise computerised mannequins, role-play, standardised or simulated patients, and virtual simulations. —The use of virtual simulations needs to become part of the overall simulation program.

57.	**Brown, Darby, and Coronel (2019)** An Escape Room as a Simulation Teaching Strategy **USA**	To create, implement, and appraise the use of escape room concepts within a urosepsis high-fidelity simulation scenario	Baccalaureate nursing student (level III) Sample size: 9	Electronic survey Descriptive study	Students reported that the escape game contributed to their learning and improved their ability to delegate tasks and work as a team.
58.	**Bryant et al. (2020**) Innovations in Simulation: Nursing Leaders' Exchange of Best Practices **USA**	To exchange ideas, discuss innovations, and make recommendations for advancing the use of simulation in ways relevant to twentyfirst-century healthcare professionals	Simulation specialist Sample size: 15	Discussion paper	—It is important to integrate simulation into the curriculum and develop faculty to lead experiential learning, —Simulation is essential to improving educational and clinical outcomes —Deliberate practice allows learners to participate in recurring simulations to perfect their skills. —During the simulation's debriefing phase, the facilitator guides participants to understand what happened during the experience and to reflect on what could be done to improve the situation. —Simulation scenarios should be built around patient needs and promote patient safety. —Include an evaluation of the participant(s), facilitator(s), the simulation-based experience, the facility, and the support team. —The best scenarios will likely be developed by a small, multidisciplinary group that includes educators, subject matter experts, and simulation experts. —Training of faculty conducting simulations is critical.
59.	**Davies et al. (2020)** 'Ward for the day': A case study of extended immersive ward-based simulation **Australia**	To evaluate satisfaction associated with student experiences of mentorship by industry partners, self-reflection on performance, and responses to clinical situations following an episode of the extended immersive ward-based simulation.	Students enrolled in a three-year Bachelor of Nursing program. Sample size: 243	Mixed methods case study	—The highest level of student satisfaction occurred when students were allowed to debrief and reflect on what happened during each shift. —The opportunity for clinical learning achieved the second highest level of student satisfaction. —Clinical skill facilitators increased the realism of each scenario by recreating interruptions and distractions that would commonly occur on a busy ward. —A script was written for various Confederate roles. The clinical skills facilitator followed the same script to standardise the behaviour of confederate roles across each demonstration room. —Students received a pre-briefing session about the simulation exercise before being placed into teams comprising 10– 12 students.

					—Educators performed a variety of roles, including the preparation of students, coordination of clinical incidents and identifying incidents for discussion. —The design of each scenario included achievable objectives of action-orientated behaviours in response to different simulated experiences. Students were expected to process information, problem-solve and achieve desired learning outcomes.
60.	**Parker & Welch (2021)** Innovative teaching strategies to escape the anxiety in simulation **USA**	To provide detailed instructions and demonstrate how to easily develop meaningful, fun and engaging escape room exercises for students yet manageable and budget-friendly for faculty.	Expert opinion paper	Discussion paper	— Escape room exercises are innovative teaching strategies that, when integrated into the simulation experience, effectively decrease student anxiety and improve learning outcomes. — Escape Rooms provide opportunities to observe critical thinking and promote team building for individuals working or socialising and learning together.

ANNEXURE 23: DATA CODES, CATEGORIES AND SUBCATEGORIES

ODE	CATEGORY	SUB-CATEGORIES	AUTHORS
1. **Student elements**	a) **Students' preparation**	• Students complete a[illegible]ourse content learning activities (lec[illegible] assessments) an[illegible]nted to simulation learning en[illegible] the	Herlihy & Teel **(2020);** Tyerman, Luctkar-Flude, Graham, Coffey & Olsen-Lynch **(2019);** Kostovich, O'Rourke & Lee **(2020);** Arthur, Levett-Jones & Kable **(2013);** McDermott, Sarasnick & Timcheck **(2017);** INACSL Standards Committee, McDermott, Ludlow, Horsley & Meakim **(2021);** McDermott **(2020);** Reibel, Cason & Screws **(2019);** Ludlow (2021)
	b) **Instruction methods/practices**	• Deliberate practice	Guimond, Foreman & Werb **(2019);** Liaw, Koh, Dawood, Kowitlawakul, Zhou, Lau, & Tiang **(2014);** Bryant, Aebersold, Jeffries, & Kardong-Edgren **(2020);** Kuszajewski, Vaughn, Bowers, Smallheer, Hueckel, & Molloy **(2021);** Willhaus, Averette, Gates, Jackson & Windnagel (2014)
		• Debriefing	Arthur, Levett-Jones & Kable **(2013);** Decker, Fey, Sideras, Caballero, Rockstraw, Boese, Franklin, Gloe, Lioce, Sando, Meakim, Borum **(2013);** Davis, Koppelman, Gordon, Coleman, Heitzler & Fall-Dickson **(2018);** Tjoflåt, Koyo & Bø, **(2021**); Aebersold, Michelle **(2018);** Liaw, Koh, Dawood et al. **(2014);** Tyerman, Luctkar-Flude, Graham, Coffey & OlsenLynch **(2019);** Hall & Tori **(2017)**
		to better s[illegible] Prebriefing • prebriefing leads learner — outcomes.	INACSL Standards Committee, McDermott, Ludlow, Horsley & Meakim **(2021);** McDermott **(2016);** Tyerman, Luctkar-Flude, Graham, Coffey & Olsen-Lynch **(2019);** McDermott **(2020);** Reibel, Cason & Screws **(2019**); White **(2017);** Kostovich, O'Rourke, & Lee A **(2020);** Aebersold **(2018);** Guimond et al. (2019).
			Davis, Koppelman, Gordon, Coleman, Heitzler & Fall-Dickson **(2018);** Liaw, Koh, Dawood et al. **(2014**)**;** Davies, Schultz, Sundin & Jacob (2020)
		Providing cues during scenario [illegible]ded debr	Oh, Jeon & Koh **(2015);** Liaw, Koh, Dawood et al. **(2014**)
		• Role-playing	Sawyer, Eppich, Brett-Fleegler, Grant & Cheng **(2016);** Herlihy & Teel **(2020**); McDermott, Sarasnick, & Timcheck (2017); Reibel, Cason & Screws **(2019**)
	c) **Students' roles/tasks**	• Use of standardised patient - • Complete coursework self-	Herlihy & Teel **(2020**); McDermott, Sarasnick & Timcheck (2017); Tyerman et al. **(2019);** Reibel, Cason & Screws **(2019**); Verkuyl, Lapum, St-Amant, Hughes, Romaniuk & McCulloch (2020); Liaw, Koh, Dawood et al. **(2014);** Davies, Schultz, Sundin & Jacob (2020). Guimond et al. (2019)
			Arthur et al. **(2013**); Oh, Jeon & Koh **(2015);** Hayden et al. **(2014);** Davis et al. **(2018);** Liaw et al. **(2014);** Franklin, Sideras, Dodd & Hutson (2021);

	d) Students Competencies	• Complete simula activities, post-simul and self and assume	

		• psychomotor skills, clinical reasoning, and reflective thinking skills; communication skills, critical thinking, management of care, safe practice, technical skills, professionalism, and ethical practice; time management, teamwork, collaborative, patient-centred and leadership skills	

2. Lecturer preparation	**a) Faculty training needs**	• Trained in the use of simulation pedagogy to design simulation-based nursing programmes *(curriculum development to integrate simulation)*	
	b) Faculty roles	• Equipped with prebriefing, scenario development, and the debriefing process and skills	Jeffries, Dreifuerst, Kardong-edgren & Hayden **(2015);** White (**2017)**; McDermott, Sarasnick & Timcheck **(2017);** McDermott **(2016);** Arthur, Levett-Jones, & Kable **(2013);** Beroz, (2017); Tjoflåt, Koyo & Bø, **(2021**); Dale-Tam, Menard & Posner (2021)
		•	White (**2017)**; McDermott, Sarasnick & Timcheck, (**2017);** McDermott **(2016);** Tjoflåt, Koyo & Bø, **(2021**); Arthur, Levett-Jones, & Kable **(2013**); Jeffries, Dreifuerst, Kardong-edgren & Hayden **(2015);** Herlihy & Teel (2020); Alexander, Durham, Hooper, Jeffries, Goldman, Kardong-edgren, Spector, Tagliareni, Radtke, & Tillman (2015); Shaw-Battista, Belew, Anderson & van Schaik **(2015);** Dale-Tam, Menard & Posner (2021)
		• Evaluation of simulation learning experiences.	
		Facilitation skills	Jeffries, Dreifuerst, Kardong-edgren & Hayden **(2015).**
		•	Beroz, Sabrina **(2017);** Jeffries, Dreifuerst, Kardong-edgren & Hayden **(2015);** Tjoflåt, Koyo & Bø **(2021**); Arthur, Levett-Jones, & Kable **(2013;** McDermott, Sarasnick, & Timcheck **(2017** Grota, O'Neal, Shelton & McNutt **(2020**)**;** Alexander, Durham, Hooper, et al. **(2015);** Shaw-Battista, Belew, Anderson & van Schaik **(2015);** Dale-Tam, Menard & Posner (2021)
		• Awareness and implementation of the INACSL Standards of Best Practice: Simulation	Alexander, Durham, Hooper, et al. **(2015);** White (**2017)**; Beroz **(2017).**
		• Trained in the use of simulation equipment/technologies	Jeffries, Dreifuerst, Kardong-edgren & Hayden **(2015);** Arthur, LevettJones, & Kable **(2013);** van Vuuren, Seekoe & Goon **(2018).**
		Oriented to policies for managing stress response during simulation experiences.	Willhaus, Averette, Gates, Jackson, & Windnagel (2014)
		Plan and facilitate pre-simulation activities for students.	McDermott, Sarasnick & Timcheck **(2017);** Herlihy & Teel **(2020);** McDermott **(2016);** Reibel, Cason, & Screws **(2019);** Shaw-Battista, Belew, Anderson & van Schaik **(2015);** White, **(2017);** Tjoflåt, Koyo & Bø, **(2021**)
			Sawyer, Eppich, Brett-Fleegler, Grant & Cheng **(2016);** McDermott, Sarasnick, Timcheck **(2017);** Kostovich, Carol T. O'Rourke, Jenny

		• Facilitate student learning during the simulation experience (briefing, scenario, and debriefing) • Provides an interactive learning environment for students during the simulation experience • Develop student learning objectives to guide the simulation experiences. • Identifies students' learning gaps to inform the development of the simulation experience. • creates a psychologically safe learning environment • plans and develops the complexities of the simulation scenarios • Evaluates student learning •	Stephen, Lee Anne **(2020);** Arthur, Levett-Jones, & Kable **(2013);** Alexander, Durham, Hooper, Jeffries et al. **(2015);** Liaw, Koh, Dawood et al. **(2014** Beroz **(2017);** Alexander, Durham, Hooper, Jeffries et al. **(2015);** DaleTam, Menard & Posner (2021) White (**2017)**; Sawyer, Eppich, Brett-Fleegler, Grant & Cheng, **(2016);** Jeffries, Dreifuerst, Kardong-edgren & Hayden **(2015);** Arthur, LevettJones, & Kable **(2013).** McDermott, Sarasnick & Timcheck **(2017);** Dale-Tam, Menard & Posner (2021) McDermott, Sarasnick & Timcheck **(2017);** Kostovich, O'Rourke & Lee **(2020);** Willhaus, Averette, Gates, Jackson & Windnagel **(2014);** Jeffries, Dreifuerst, Kardong-edgren & Hayden **(2015);** Verkuyl, Lapum, St-Amant, Hughes, Romaniuk & McCulloch **(2020);** Dale-Tam, Menard & Posner (2021) White, Meagan **(2017);** Franklin, Sideras, Dodd & Hutson **(2021);** Jeffries, Dreifuerst, Kardong-edgren & Hayden **(2015);** Arthur, Levett-Jones, & Kable **(2013).** Gordon, Randy M **(2017);** Jeffries, Dreifuerst, Kardong-edgren & Hayden **(2015);** Tjoflåt, Koyo & Bø **(2021**); Grota, O'Neal, Shelton & McNutt (2020).

3. Designing simulations	**a) Prebriefing**	• Purpose: — Prepare learners for the simulation they will encounter and briefing. • Guidelines: — Facilitated by a competent simulationist knowledgeable about the scenario and the briefing concepts, — the preparatory and briefing activities should be based on the purpose, objectives and expected outcomes of the simulation-based experience. — The planned prebriefing experience should be at the learner's level of knowledge.	Ludlow **(2021);** Brennan **(2022);** Tyerman et al. **(2019);** INACSL Standards Committee, McDermott, Ludlow, Horsley & Meakim **(2021);** McDermott **(2016; 2020).** INACSL Standards Committee, McDermott, Ludlow, Horsley & Meakim **(2021);** Tyerman et al. **(2019);** McDermott **(2016; 2020);** White **(2017);** Rutherford-Hemming et al. (2019);
		— Require the use of a standardised briefing tool (script)	

		Prebriefing content: • Facilitator and student expectations, — establishing psychological safety, fiction contract, review of simulation objectives and debriefing methods; review of the plan of care; logistics of the SBE time period (briefing, scenario, and debriefing); orientation to the simulation environment, hands-on orientation to the simulation equipment, manikins, environment, and supplies Prebriefing phases/elements: • 3-phased process (planning, briefing, — facilitation) — 2-phased process (preparation and briefing) — Prebriefing facilitation strategy: Know: Do: Teach — Self-Efficacy Prebriefing Model	Tyerman, et al. **(2019);** Aebersold **(2018);** Ludlow **(2021);** Brennan (2022); INACSL Standards Committee et al. **(2021);** McDermott **(2020);** Reibel et al. **(2019);** Dale-Tam et al. **(2021);** Tjoflåt et al. (2021); McDermmot, Sarasnick & Timcheck **(2017);** Rutherford-Hemming et al. **(2019)**. McDermott **(2016;2020**); Guimond, Foreman & Werb **(2019);** Ludlow **(2021);** INACSL, McDermott et al. (2021) McDermott (2020) Brennan (2022)

	b) Debriefing	• Debriefing process:	

		• Staff preparation; establish learning objectives; develop a rubric to evaluate student performance; organise students in groups; should be facilitated by the staff who observed the simulation experience; select a debriefing framework to guide the debriefing session • Facilitation methods: Facilitator-guided; self (learner)-guided Facilitation adjuncts: • Using a codebriefer, debriefing script, video review Debriefing timing Within-event and post-event Debriefing frameworks: Debriefing with good judgement; the 3D Model (defusing, discovering, and deepening); GAS model (gather, analysing and summarising); "PEARLS" (Promoting Excellence and Reflective Learning in Simulation); TeamGuided; The healthcare simulation after action review (AAR); Debriefing for Meaningful Learning (DML); Debriefing Assessment for Simulation in Healthcare (DASH) tool Observational Structured Assessment of Debriefing (OSAD) tool.	Sawyer et al. **(2016);** Aebersold **(2018);** Decker et al. **(2013);** McDermott, Sarasnick & Timcheck **(2017);** Beroz **(2017);** Hall & Tori **(2017);** Jeffries et al. **(2015);** Kostovich et al. **(2020);** Verkuyl et al. (2020). Sawyer et al. **(2016),** Arthur et al. (2013), Hall & Tori (2017), and Verkuyl et al. (2020). Sawyer et al. **(2016);** McDermott, Sarasnick & Timcheck **(2017);** Hall & Tori **(2017);** Liaw et al. **(2014);** White (2017) Sawyer et al. **(2016);** Davies, Schultz, Sundin & Jacob (2020); Hall & Tori **(2017);** Guimond, Foreman & Werb (2019) Sawyer et al. **(2016);** McDermott, Sarasnick & Timcheck **(2017);** Beroz **(2017);** McDermott **(2020);** Gordon **(2017);** Jeffries et al. (2015); Dale-Tam (2021); Hall et al. (2017).
	c) Simulation scenario	• Guidelines for scenario development:	

		— Establish learning objectives based on need assessment findings, patient information, actor scripts, information for the fidelity simulator, timeline for the unfolding of the scenario, cues — Require subject experts to design the scenario, and they should be knowledgeable about the programme outcomes; a simulation scenario should be standardised; those who facilitate the simulation experience must be knowledgeable about the scenario; it	Aebersold **(2018);** McDermott et al **(2017);** Davies et al **(2020);** Liaw et al **(2014);** White (2017) Aebersold **(2018);** INACSL Standards Committee **(2016);** Bryant et al. **(2020);** Jeffries et al. **(2015);** White (2017)

		should be based on patient needs and promote patient safety; must focus on learners needs; should be built by a small multidisciplinary team or use purchased scenarios.	
	d) Simulation fidelity	• Types of simulation fidelity: They include low, medium, or high-fidelity human patient simulation or part-task trainers, environmental fidelity, standardised patient Simulation realism: Creation of fidelity within the scenario. Created by adding interrupters and distractors that occur in clinical practice • — —	Arthur et al. **(2013);** McDermott, Sarasnick & Timcheck **(2017);** Beroz **(2017);** Hyden et al. **(2014);** Liaw et al. **(2014);** van Vuuren et al. **(2018);** Grota et al. **(2020);** Zitzelsberger, Coffey, Graham, Papaconstantinou, Anyinam, Dodd & Mangal (2017); McLaughlin, Starobin & Laanan **(2010**); Reid, Ralph, El-Masri & Ziefle (**2020);** Guimond et al. (2019) McFaden
	e) Simulation evaluation	• Types of simulation evaluation: — Formative, summative, high-stakes and remedial evaluation	Sando, Coggins, Meakim, Franklin, Gloe, Boese, Decker, Lioce & Borum **(2013);** Aebersold **(2018);** McDermott et al. **(2017);** INACSL Standards Committee **(2016);** Liaw et al. (2014); Grota et al. **(2020);** Zitzelsberger, Coffey, Graham, Papaconstantinou, Anyinam, Dodd & Mangal (2017)

Innovation in simulation	**Standards, teaching strategies and teaching-learning setting**	— INACSL standards — Extended immersive simulation — Escape room exercises — Virtual simulation	Bryant et al. **(2020);** Sando, Coggins, Meakim, Franklin, Gloe, Boese, Decker, Lioce & Borum **(2013);** Aebersold **(2018);** McDermott et al. **(2017);** INACSL Standards Committee **(2016, 2021);** Davies et al. **(2020)** Parker & Welch **(2021)** Verkuyl et al. **(2020);** Gordon **(2017);** Williams et al. (2017)

ANNEXURE 24: SAMPLE OF DATA TRANSCRIPTS- FRAMEWORK DEVELOPMENT

Introduction: The research supervisor welcomed everyone into the meeting and highlighted that the plan was to develop the framework according to Jeffries, which was shared by the researcher together with the meta-findings in advance. The plan is to pull out statements to guide the Faculty regarding integrating simulation-based education.

Expert 1: the framework is designed for Eswatini, and they have no experience or equipment. They have got nothing, it seems, and then it comes out in the survey. Am I right? It is not just dissimilar to the University of Gloucestershire. So, your eventual aim is to design a booklet to assist educators in implementing simulations. And it is going to be a Framework?

Expert 2: you are right when you talk about a booklet, something that a Faculty can say, okay, we have been given a million rand; where do we start?

Expert 1: okay. I think you gotta make it context-specific for Eswatini; it cannot be first-world related where they are doing a lot of high fidelity and VR. Honestly, many universities are still struggling with it, but. Then, make sure that your framework addresses context, background and design.

I would say your booklet should start; your booklet would have to be a one-step process. Choose one course; you talk about midwifery a lot in your background. First, design your programme to address or embed simulation within a midwifery programme or what have you got? What is available at the moment, and how? How you can train the educators to use what they have got. But in a simulation, critical thinking, immersive scenario-driven fashion. And what are the principles of simulation that they need to know and understand in order to be able to to do that? Just for that one programme alone? To start small.

In your booklet, you can say choose a programme to concentrate on that first. And then, everyone is familiar with the principles and the concepts and how it can be done and to go further. Because you could use, you have not got, You haven't got the mannequin she hasn't got. Can they? Researcher: oh, I am not sure yet, and yes, there aren't much resources. But the Department of Midwifery has started looking for funders.

Expert 1: So, I know that the problem with introducing simulation is that everybody or most educators all look at the variety of resources and the fancy machinery in high fidelity. But that's not, that's nice to have, but that's not the basis and principles. You don't need that to have a good evidence-based simulation going on. It is about putting it all together in an engaging, context-specific, challenging situation for students to apply the theory they have learned to practice.

We did not have high-fidelity mannequins at Wits when we started the programme, but we got great midwifery simulation experience using Mama Natali. It is leather-made and made cheap and accessible in third-world countries to prevent neonatal death. So, that is a low fidelity.

So, I would think the way to approach it is to base your booklet on sound Jeffries theory and INACSL standards for simulation. Just start with one thing, step:

• Train the nurse educators, but then, in your framework, make it possible to spread the news. Get one or two simulation specialists training in simulation to take it out upwards.

Expert 2: so, I like the sound of it, and I like doing it step-wise, and it could work, and all of the explanation goes to the background. But I was thinking as you make the pieces of advice, whatever,

that you would use your data as an explanation of why. For instance, it says one of the recommendations, let's call them that, will be to start simple. And then the reason why is from your study, you've seen that there are no mannequins, whatever is the situation. That would then pull use the data that you've got, which is very important.

Expert 1: Yeah, and then I think you should relate to your collected data. And it is there, and it says in your data that you don't have the mannequins, and the educators don't really know the concepts of simulation-based education. It's that you don't, and you haven't got the where it calls to run huge training programmes, and I actually think huge training programmes don't work. You know you've gotta do it on a need basis, identified.

Expert 2: yeah, I agree.

Expert 1: So, I think you can make your framework over 6 months, one year, 18 months, 2 years. Those are my thoughts about it.

Expert 2: yeah, I think they are good thoughts, and they kind of simplify things a bit. Because so then…, this initial one would have statements or recommendations, for instance, about that. If I look at the design (concept), they say, Aah, identify objectives, select appropriate fidelity dimensions. Have you seen that? In the summary of Jeffries that she sent us.

Expert 2: So, in the design, the first thing it says is that the key element of a design is identifying objectives. So, the plan would be to have a statement regarding identifying objectives. And it must be contextual.

Expert 1: So the objectives would be the objective. After the learning session, what do you want to achieve at the end of it? But, the objective would be to inform educators about simulation principles.

Expert 2: yeah, that would be broader than the objectives of the simulation scenario; this would be for the simulation centre. What would we call it? A simulation environment?

Expert 1: yeah, that would be it.

Expert 2: yeah, but what are the objectives for embedding simulation into the programme? So, what message would you give regarding the simulation programme? And one of them has been identified to start small. One other objective would be to select the area of importance and plan the rest of the programme in phases, starting with this particular one; as you have rightly pointed out, in this case, it would be midwifery. But then you would relate the reason why, and the data clearly showed that midwifery has issues, and the problems are really overwhelming, but you need to start somewhere.

Expert 1: okay, thinking of midwifery, yeah, you know if you are thinking of making it, that scaffolding difficult of it and introduce into the introduction to midwifery. You are ready to roll if you got that baby breath mannequins. But make sure the educator knows to use them well. You gotta do the breech with it, shoulder dystocia; you can state that you can make it complex as the students progress through the midwifery training. And you can end with a postpartum haemorrhage. The other part with it would also be neonatal to help birth breath, which midwives need to know about- low APGAR baby.

Expert 2: okay, then the two issues with identifying the objectives for the programme are (1) identifying a priority area to start working with and (2) moving from simple to complex procedures—that sort of generic advice. But in the context of midwifery, one would expect that.

Expert 1: and I think you got it all there. You just need to take what is relevant to the simulation champion and a lot of these things you don't have in Eswatini. Some things are relevant, such as that you can't integrate simulation without formal training. So in the booklet for the midwives, say, I don't know, at what level of training you have to identify the year and where they are in the training. So, you have to train the educators and guide them on how to put together a simulation. What is the student expectation, prebriefing, how to develop that scenario, debriefing? Get them trained, and they become simulation champions to take simulation further.

Expert 2: yeah, I was also thinking when it comes, for instance, to facilitator and educational strategies. You have learned a lot from your data about potential facilitators. So you know about their motivation and preknowledge already, so can't that help?

Researcher: I am not sure whether I am getting the question clearly.

Expert 2: I am looking at, when it comes to, the section on Jeffries on facilitator and educational strategies. One of the things is that the facilitator is someone responsible for students' learning needs. You could have a section of your guidelines of you're your programme into, first of all, identify the strengths and weaknesses of the existing staff, and the motivation. In your backup crossreferencing your study, you know they are motivated and already have a certain amount of knowledge. So one of the things you will build on is the existing motivation and knowledge, and you could refer to your data, say, they are already interested and umm aah, and have the motivation to get the equipment you are talking about. It is not in here.

Researcher: Yeah, it's not.

Expert 1: what did the educators understand about the simulation they were interested in implementing?

Researcher: well, that aspect was not covered in the tool, so it was one question that measured the readiness for simulation. However, regarding aspects being trained in simulation use, there wasn't formally trained.

Expert 1: that should be brought up as a rationale for training the educators. Because educators need to be trained on the concepts of simulation since they don't have the background, training has to happen on a need basis, and it is dependant on the programme they suit implementing it.

Expert 2: I think that should be your rationale. So, I am trying to look at what is it going to look like, statements and rationale for each. And the rationale is going to be pulled from your studies.

Expert 1: I think so; you mentioned the work library as well, that was interesting. I don't use the library; I use Google. But there are so much online and specific directions that you can use. There is YouTube for scenario development that you can watch and adapt. How to develop a simulation scenario that you could use to introduce your educators. So that could address the lack of simulation knowledge because, yeah. You really need to simplify it to give it an application in Eswatini.

Researcher: thank you for the input; so, what are we going to say regarding the lack of simulation equipment and infrastructure? To set up a basic simulation lab for the midwifery programme.

Expert 2: yeah, I'm just thinking under the design, you actually, it doesn't talk about the place where it is going to take place. But the first part of your study talks about the available space. Somewhere, you need to put its recommendations for how to use the space, how to use the existing equipment, and how to keep it cheap.

Expert 1: do you talk a lot about low fidelity, or you talk a lot about high fidelity?

Researcher: mostly is low-fidelity.

Expert 1: have you mentioned the use of standardised patients?

Expert 2: yes, they did come up in the findings. So, that would then be in the recommendations to use low-fidelity and standardised patients. That is what I am saying: when you are doing the design part, you have to put in a section about the space, equipment and levels of fidelity, the low fidelity.

Expert 1: I will not exclude the potential for buying high-fidelity equipment. That is going to take some time, a year or two. I don't know how much it will take.

Expert 2: yeah. Or maybe one of the guidelines should be how to prioritise and be ready to; sometimes you will suddenly get the grant, and you are going to spend it in a week. So, part of the guidelines needs to say how do you prioritise and have a wishlist if funding becomes available; this is what would be purchased. That is an important lesson they need to learn as well.

Expert 1: Yeah, that's because there is a lot written about buying equipment before the simulation programme has been established. There must be a need assessment as to what equipment best used as to what is happening at the moment. And I mean, we had a champion and got money for two anatomy tables. Only one table is being used at the moment, and they put an incredible amount of money in my opinion; it is completely wasted because the need analysis hadn't been done. And there isn't an existing programme or framework that needs to be designed like you are doing to guide the process. So, you have to cover it in the framework you are working on.

So, when you have made an informed decision, what best would be utilised for, and the number of students you got, the space for the environment and how often the equipment is going to be used. Because there is a lot written about mannequins sitting on cardboard, to me, what is important for your PhD is that you relate the findings to what Jeffries has identified. What is existing at the moment, designing it and embedding it in a programme, and got to say what you can do next year with the potential or development for a possible expansion. And that your programme framework would be written in 6 months, a year, 18 months, 2 years, 3 months, and 5 years for the future.

And then, if you get a grant -get money available, one of the considerations is that one of your educators does the Society for Simulation Healthcare (SSH) facilitator/educator training. It is an online course; you can do it online.

Expert 2: so I am thinking, listen to you, another plan is forming in my mind. I was thinking of taking the information you got on the slide, on the screen (lesson learned table) and putting it on the various aspects. But I think it is the other way around. I think talking to Hilary now; you need to have getting number one background and then what should happen the rationale all from your study. As you move on to design, what from all the recommendations and advice do you have regarding design and the rationale from your study? Does that sound sensible? I think this could be an easier way of doing it.

Expert 1: and it gotta be a practical aspect of it. To say, this is what we got, and this is what we can do, and this is what we hope to be able to do in future because we can't start with a five-year plan because that can't be feasible. And the whole time, you got to talk about the conditions in Eswatini.

Expert 2: yeah, and I think from your scoping review, you got a lot of useful advice, and so that can go in too under the Jeffries heading, and from the survey and the audit, you can have the rationale. Does okay mean it is a good, sensible plan?

Researcher: it is, even though I seem to pick it up a bit slow in terms of. Oh, okay now, from the data I have collected, the scoping review and the survey studies. So, I need to use it to develop the topics/concepts using the Jeffries as a structure and give a rationale as to how this will work out for Eswatini.

Expert 2: is for why you are making the specific recommendations. Because the scoping review can, say, train everyone on simulation. But you are not gonna do that. You gonna do it differently?

Expert 1: yeah, I think it is good. I think there is a lot in here. But I think your data in the scoping review does not relate to the situation in Eswatini. It is in a perfect world. I think from this; you have to take out what you can implement and then now with the hope that you can develop your programme/centre to include general nursing or getting virtual reality. Whatever your plans are at that stage, remember the simulation is scenario-driven, about developing clinical judgment and allowing students to practice in a safe learning environment. It is about task training, getting the skills perfect. So I am sure that is happening in Eswatini.

Also, it is important to get feedback from the students and educators and then take it to the next step.

Expert 2: you will also have the opportunity to say like Expert 1 suggested six months, 12 months, 18 months, so in your recommendation, you can say for the first six months concentrate on human resources; you can do all sorts because this guide to them what to be like a five-year plan for integrating it into the curriculum because it is not going to happen instantly. And maybe that should come to the background, too.

Expert 1: also, you have to be able to support your proposal request for equipment because it is to be embedded into the curriculum and not on the side. So, you chose midwifery, which means you have to identify time in your programme timetable for the student simulation learning and development of the facilitators/educators' on-the-job training.

Expert 2: I think I got a better idea right now. I think the most important thing is that Sithembile is in the right place now.

Expert 1: does it make sense, Sithembile (Researcher)?

Researcher: yeah, a little bit.

Expert 2: I am just reading your component B (lesson learned table) about lecturer/nursing educators' academic staff preparation. In the scoping review, it got a lot of useful information like; you said it is challenging to embed SBE without formal training. So immediately, one of the ideas is how you would go about formal training. Then you need to contextualise it into how much knowledge or little knowledge they already have because you got on the right-hand side, you talk about staff being proficient in using technology. So maybe step 1 is to make sure they can use computerised equipment and audiovisuals. Step 2: learn how to use low-fidelity equipment. So, I think you got it here already. So, it is just a matter of pulling it out and structuring it in a practical format. And you got information about debriefing and evaluating student learning. And if you look at the right column of the table, you fore instead have information about developing a scenario. So, what needs to happen on the right-hand side of the table to give the rationale? Why are you saying that for Eswatini? Expert 1: how are you going to get them formal training? What is your plan?

Researcher: oh, okay, I did not really have a plan. But I should think of a way to get the educators trained.

Expert 2: I think it is part of the plan, actually. Clearly, part of the example is ensuring a champion is identified and trained first. And that you really have all the sort of knowledge here. And also, remember, with this section, there is nothing that should stop you from pulling in additional literature.

Expert 1: and although it is formal training. It necessarily means you have to undergo a classroom formal/certificate course but with a remedial purpose. Specific training can be identified on a needassessment basis. So, I will start by identifying a champion and make sure they access online training stuff and be supported when going through it. Also, the champion, having gone through that, can actually be simultaneously developing a simulation programme and would be able to take it to the next level of development. They become the trainer themselves for new staff members.

Expert 1: it has to be implementable in Eswatini. And how can that be, just small steps at a time?

Researcher: I am just wondering what the framework will look like.

Expert 2: it is going to look like it has many chapters. The first chapter would be on the background and explaining things like the outcomes for this programme, and you go into saying what the outcome should be, and on the right-hand side, you are going to say why you are saying that. What the outcome should be is going to be withdrawn from the scoping review; contextualised knowledge and the rationale will come from the survey output. You then have to state when each thing should happen.

Expert 1: you have already written about the ideal situation and these lessons learned. I think there is a very clear picture of the ideal. So now you gonna write about is what can be applied from the ideal to what you got your context on. So, the next step is about Eswatini.

Expert 2: but then also the format of it in order to you gonna do the Delphi too, with your staff to say whether they agree or disagree. So, you also need to have some statements they can say yes/no/maybe.

Expert 1: how do you describe the ideal of the situation of Eswatini?

Expert 2: that would be your statement, and your rationale comes from the survey and audit. For instance, Jefrries might say something that is not feasible, but it’s a good idea to apply to Eswatini; this is what you are suggesting.

Researcher: do we still need to follow the Jeffries concepts when writing these statements?

Expert 2: yes, absolutely.

Expert 1: yes! That gonna give you the structure. What is your environment, what is your background, context, and design, and how can you design? Because you can’t design, your design is supposed to be implementable. You know, even, I don’t know, even if you do this via Delphi. You know, when starting on a one programme basis, you could have even to do that first step. You can implement it. You say to the midwifery lecturers how about we implement just the first step and see. I know it is not in your proposal, but it is not very difficult to implement and collect feedback.

ANNEXURE 25: IDENTIFICATION OF THE COMPONENTS OF THE FRAMEWORK (SIMULATION EXPERTS RESPONSES)

Sub-component	Scoping review	Survey A: Simulation centres/laboratories Audit	Survey B: Eswatini educators' perspectives	SIMULATION EXPERTS' REMARKS
	Component A: Human resources (personnel) for ensuring sustainable simulation-based education include:			
	• Nurse educators who are simulation champions.	• A simulation coordinator (champion) among academic staff to direct simulation activities. • An adequate ratio of educators to students to facilitate learning during simulation sessions • Simulation technicians are needed to manage simulation equipment and provide technical support.	• Simulation champions among educators, management, clinicians, technology specialists, management assistants, and support staff to support and ensure SBE readiness. • Credentialed or trained simulation specialists who mentor/coach others, including other simulation experts. • Graduate-level prepared researchers to assist in searching for new knowledge appropriate to the NEI's mission. • Librarians should be available in the institution to help search for evidencebased practices and related simulation resources. • A critical mass of educators who possess strong knowledge, skills, and attitudes about SBE must be available in the institution. • Technicians and technologists are needed to train the instructors/educators on using and managing simulation technologies.	• Facilitators' educational strategies: • Simulation champions required

	N/A	**Existing challenges**	

		• SBE activities were poorly coordinated due to a lack of a designated academic staff member for this task. • The simulation centres had challenges facilitating simulation learning experiences during sessions due to fewer educators than students.	• The nurse educators who used simulation as a teaching modality were not supported due to the absence of simulation experts or trained individuals who can provide mentorship and model SBE best practices. • There is a possibility that the development of simulation scenarios is not informed by current evidence and practices due to a shortage of librarians to assist in searching for such knowledge. • There is a possibility that SBE is not based on current evidence, standards, and guidelines because such practice is not widely promoted as part of the institution's culture. • The commitment to SBE is challenged by the almost inexistence of simulation champions among the management, clinicians, technology specialists, management assistants, and support staff. • There is a high risk of poor uptake or use of simulation technologies due to the limited number of technicians available to support educators in learning how the resources are used and managed.	• Upskill educators on simulation principles • These contextual factors impact the background and design elements. -unavailability of trained educators. -inexistence of simulation champions. -lack of simulation equipment technicians.
	Component B: Lecturers/Nurse Educators'/Academic Staff Preparation			

Educators' Training Needs and Roles and Responsibilities	• It is challenging to integrate simulationbased education without formal training. • Faculty needs to be trained on simulation use regardless of any field of speciality, e.g., midwifery lecturers). The aspects of the training include knowledge and skills on how to: —Develop, implement, and integrate simulation into a nursing curriculum. —Facilitate simulation learning experiences. —Plan and facilitate the pre-briefing sessions. — Conduct debriefing, provide feedback, and evaluate student learning and simulation quality. —Operate the simulation technologies—mannequins. —Develop simulation scenarios. • Simulation can be realised as a teaching modality through formal training. • Nurse educators are responsible for preparing, structuring, and administering student learning, guiding and supporting them during pre-briefing, scenario, and debriefing periods: — Develops and provides pre-simulation lessons using a variety of preparatory learning activities, —Establishes a psychologically safe learning environment, — Provides logistics about the simulation experience and orients the learners to the learning space and equipment resources they will use in the scenario. —Faculty conduct a need assessment to inform the scenario.	• It is essential to have a team of instructors/nurse educators trained in SBE to facilitate simulation learning effectively. • It is essential to allocate money to support the initial training of educators. • Providing funding for skills advancement is essential to promote ongoing faculty development. • Allocating funding for subscribing for membership to a recognised simulation organisation is vital to ensure access to current knowledge and practices. • Nurse educators must be trained to plan a simulation in order to provide comprehensive quality learning experiences and ensure effective use of the teaching strategy, —Nurse educators must be trained in implementing a scenario to prepare students for real-life clinical experiences. —Nurse educators must be trained in evaluating a simulation experience using a recognised instrument to ensure standardised teaching and learning. —Nurse educators must be trained to write simulation scenarios to ensure students gain experiential learning in responding to different patient situations and reduce the stress	• The academic staff must possess strong knowledge, skills, and a positive attitude to effectively design, develop, integrate, evaluate, and support student learning. • Staff must be proficient in using technology (computer, audio-visual, and information technology systems) to ensure readiness for culture change. • Educators need preparation to integrate SBE into the curriculum. • Educators must engage in research to discover innovative simulation practices needed to advance the quality of student clinical outcomes. • Educators need training on how to manage simulation technologies (mannequins). • Funding is necessary for supporting educators' training to advance and ensure the appropriate use of SBE. • Funding is needed to support educators committed to integrating SBE into the curriculum, including release time.	• Facilitator and educational strategies considerations: - Educators need preparation to integrate SBE into the curriculum. - Train educators on a need basis. • Considerations for the Jeffris design element: - Nurse educators need training on their core responsibilities: student preparation, prebriefing, scenario development and debriefing. - Simulation learning is scenario-driven. • Structural issues such as funding should be addressed because they affect simulation initiation and sustainability.

	– Observe student learning and maintain an appropriate fidelity.	associated with a lack of exposure to real-life settings.		

	– Evaluate and provide feedback to the learners, formative/summative. – Assists the learners in integrating theory into practice. – Leads the debriefing (reflection) process. – Guides and supports students toward achieving the simulation experience objectives.	– Nurse educators must receive training in developing assessment tools to ensure the availability of standardised evaluation instruments within the institution. – Nurse educators must be trained in applicable regulations, guidelines, and local protocols to ensure the provision of simulation experiences following set standards appropriate to the programme outcomes. – Nurse educators must be trained in preparing simulation equipment for training for them to be able to select the appropriate equipment per the students' level of education and simulation experience objectives. – Nurse educators must be trained in managing equipment after the training session to ensure the proper preservation of available resources. – Nurse educators must be trained in integrating simulation into the curriculum to ensure that this pedagogy consistently guides clinical teaching and learning in the educational programme, not as the by-theway approach. – Nurse educators must be trained to use and prepare standardised patients to provide learning experiences that capture the affective domain mainly and		

		basic/noninvasive technical skills.		

		—Nurse educators must be trained to use computerised mannequins to develop clinical experiences that allow students to learn and perform technical and non-technical clinical skills. —Nurse educators must be trained to use non-computerised mannequins to develop clinical knowledge and skills using low-fidelity equipment. — Nurse educators must be formally prepared to use task trainers to demonstrate low-fidelity technical skills that are paramount to developing foundational nursing skills. —Nurse educators must be able to use high-fidelity equipment to develop learning experiences that emulate various clinical experiences that could not be performed on patients due to safety and ethical reasons. —Nurse educators must be trained to use medium-fidelity equipment to provide technical clinical experiences using costeffective simulation equipment. —Nurse educators must be trained on how to facilitate debriefing to ensure students develop the intended competencies and seamlessly integrate theory into practice through SBE.		
	Existing challenges			

	N/A	• There is a risk of failure to sustain simulation-based education due to the lack of	• There is a high risk that the simulation experiences planned or implemented by	Contextual factors that impact the design

		finances invested in supporting the training of instructors or educators, budget for skill advancement, and membership subscriptions recognised simula organisations. • The simula centres/laboratories ked personnel (instructors/academic staff) clearly understood their ta and objectives given that th were some untrained in vari aspects of simulation and including plann implementing a scena writing scenarios, integra simulation into the curricul use, and prepara standardised patients, use computerised mannequins, of non-computeri of mannequins, use of h fidelity equipment and use medium-fidelity equipment. • They also lacked debriefir competencies.	the educators might be of poor quality, meaning less informative due to the absence of credentialed or formally trained educators and simulation champions to model simulation best practices. • There might be a challenge in ensuring the sustainability of SBE due to limited funding committed to faculty education and supporting this teaching strategy.	element, the lack ocase finances: is - A budget shoulc prepared in funding/grant available
	Component C: Student/learner elements			

Student preparation needs | Roles.	• Learners must engage in preparatory activities that include acquiring the theoretical knowledge/content relevant to the intended nursing skill(s) before exposure to a simulation learning experience. • Students have roles and responsibilities during simulation learning; they include: —Completing preparatory activities or content, —taking charge of their learning,	• Students must be pre-briefed to prepare them for the simulation experience. • Students must be debriefed after the simulation experience to ensure the acquisition of the intended clinical learning outcomes. • Simulation-based education offers students quality clinical experiences to meet clinical practice requirements.	• Similation-based education provides students with opportunities for experiential learning and quality experiences. • Simulation-based education must be integrated into the curriculum to fully offer the learning opportunities that lead to acquiring the programme outcomes.	Considerations that impact on the learners' outcomes. Students' roles, responsibilities and expectations that should be met when implementing simulation experiences. They are key participants.
	—respecting the simulation learning environment, — maintaining the contractual agreement of confidentiality about the content of the simulation experience, conducting a peer evaluation assessment.			
Instruction Methods /practices	• Important instruction methods or practices that enable students to achieve their learning goals include: • Deliberate practice • Role-playing • Standardises patients • Cueing • Debriefing: practices include • learner-self assessment • asking open-ended questions, • silence, • advocacy inquiry, • directive feedback, • guided team • self-correction approach and • circular questions	• Students must be debriefed to achieve the intended clinical competencies. • Using standardised patients is integral to simulation learning as one tool for achieving student learning outcomes, and there should be a designated room for preparing them.		Educational strategies
	Existing Challenges			

	N/A	• Nurse educators are not trained in using and preparing standardised patients. • There is a risk that students might not gain meaningful learning through simulation because none of the educators was trained in providing structured debriefing sessions. • There is a possibility that students are not debriefed after the simulation session in the absence of a debriefing room.	N/A	

	Component D: Designing simulations

	igning simulation involves elements that ure the simulation learning processes are eved, including pre-briefing, scenario eva elopment, fidelity, debriefing and luation. • Pre-briefing: – It is the initial step in designing simulations. – It serves as a mechanism that facilitates students' success when engaged in a simulation experience, – It is the stage where the educators promote and ensure students' psychological safety – pre-briefing involves two aspects: preparation and briefing. – Essential guidelines for the pre-briefing process include ensuring that: ○ it is conducted by an instructor knowledgeable about the simulation ○ scenario and the pre-briefing processes, student preparation activities are based on a needs assessment and align with the ○ simulation objectives, the planned preparatory activities/content should match the students' academic ○ level, students should undertake ○ the preparatory lessons before ○ engaging in the simulation learning experience. Scenario development: • The simulation scenario should be based on a real-life patient situation (backstory about a clinical condition and needs). – Simulation scenario can be developed by a small multidisciplinary team, including course lecturer, research clinicians, simulation experts and other lecturers, – They are also available as software that can be purchased.	• Briefing, debriefing, scenario, evaluation, and fidelity are crucial aspects of the simulation process inherent in simulation use.	Debriefing is an essential element of the simulation learning process, and there should be a designated room where the session should occur.	Debriefing skills are essential in simulation learning. Simulation is scenariodriven.

	– Properties of scenarios include clear student learning objectives, the patient situation, the type of mannequins, cues, standardised patients, student-assigned roles, time frames, and aspects that require problem-solving abilities. – A scenario should be scripted or presented in a template to maintain consistency. – Pilot the scenario before implementing it with the intended students • Fidelity: – Simulation learning requires physical fidelity (environment and equipment) to mimic clinical setting reality. – SBE requires three fidelity levels (lowmedium-high) to ensure learners acquire competencies across the learning domain(cognitive, psychomotor and affective). – Using high-fidelity mannequins/simulation equipment resources enables the replication of multiple patient conditions and enhances the acquisition of various competencies for undergraduate nursing students. – Evidence has shown that replacing traditional clinical hours entirely or partially across undergraduate nursing courses with high-fidelity is possible. – Medium fidelity is cost-effective and can produce comparable outcomes to high fidelity. – Mental health nurses benefit from using aspects of low-fidelity simulation, such as role-plays. – Low fidelity is associated with developing gross psychomotor and assessment skills effectively.			

	– The lack of high-fidelity equipment and resources should not limit the integration of			

	simulation-based education into a nursing programme in any setting. • Debriefing: – Students must be debriefed because that is where learning takes place in SBE, – Debriefing sessions must be conducted in every simulation experience, regardless of the delivery platform (physical/virtual) – A trained or experienced debriefer must conduct all debriefing sessions using standardised tools or frameworks. – There are two forms of debriefing: facilitator-guided (by an instructor/lecturer) and learner-guided (by the student himself/herself). – Learner-guided are utilised in virtual simulation learning or with students enrolled in a distance learning programme. – The debriefer should be an individual who observed or participated in the simulation learning experience. – Debriefing should be conducted immediately after/ post the simulation experience; however, it can be done during the scenario. – Important adjunct methods that enhance the debriefing process include co-debriefing, video-assisted debriefing, and the use of debriefing scripts.			

	• Simulation evaluation: — Through simulation, student performance can be examined across three types of assessments: ○ formative, summative ○ and ○ high stakes — The facilitator's debriefing competence should be evaluated periodically to assess and improve their skills. — The quality of the simulation scenario/learning experience is evaluated			

	to assess its effectiveness in achieving the learning outcomes. —Evaluations should be conducted by a trained instructor using validated and reliability-tested tools or instruments.			
	Component E: Infrastructure and Equipment (Simulation resources)			

IT devices and software	• Necessary simulation resources include: • Equipment for facilitating simulation learning includes: – Audio-video system for use as adjuncts during debriefing and monitoring student performance	• Technical equipment such as video, audio, and recording and broadcasting systems are needed to facilitate simulation learning.	• Information technology, computers, and audio-visual systems are needed in the simulation learning environment. • Equipment should be available to ensure readiness for simulation use.	Design aspects recommendable for facilitating learning and simulation fidelity. So far, not much is available. Given the current fiscal issues, a low-fidelity mannequin such as Mama Natali is suggested in midwifery education. High-fidelity equipment should be considered when funding is available. Implementation of the simulation should be phase-based. Start small. Start with one programme (midwifery) and gradually roll it out to other departments as knowledge expands and resources are available.
simulation equipment/tools	• Simulation equipment is necessary for creating the desired level of realism to promote optimal learning through SBE, including: – Computerised mannequins that mimic physiological features such as breathing, lung sounds, chest movements, pupillary reflex, coughs, and vomiting and can interact with students (high-fidelity)	• Simulation equipment such as obstetric mannequins, critical care mannequins, monitors and software for clinical scenarios needs to be made available in these settings. • Provision of clinical equipment such as hospital		

	_ A computerised mannequin that can reproduce human physiological features except for specialised features such as pupillary reflexes and chest movement, and task trainers for practising catheter and intravenous insertion skills (medium fidelity). _ Partial task trainers or torsos (low fidelity). _ Standardised patients _ Role-playing	beds, monitoring equipment, obstetric equipment (vacuum extractors), and consumables		
Physical Infrastructure	None	• There should be at least an accommodative training room over thirty square metres, a control room, and a debriefing room separated by a big glass window. • Bathrooms/Changing rooms	There should be a physical structure designed for simulation learning.	Simulation learning space
	Component F: Simulation Outcomes			

	• lear dents acquire a variety of outcomes and petencies through simulation-based , including: – Satisfaction – Self-efficacy – Self-confident – Reflective thinking skills critical – thinking skills, clinical skills, – assessment skills, communication – skills teamwork/collaboration – skills management and – leadership skills – clinical judgement skills – cal and professional practice attitudes – ulation scenario should contain the ethi needs of patients to ensure students • op skills applicable in clinical practice to ote patient safety.	•		Both the students and educators must evaluate simulation learning experiences to inform advancement.

ANNEXURE 26: DELPHI STUDY ROUND ONE COMMENTS

ROUND 1 COMMENTS: RELEVANCE

Domain A:

Activity 5:

Simulation cannot be a like-real educational experience. Implementation might be challenged by limited material resources ***Activity 15:***

Membership generally has financial and time commitments

ROUND 1 COMMENTS: FEASIBILITY DOMAIN A:

Activity 1:

not feasible for us to get simulation champions since most lecturers are overworked, and we do not have expert clinical instructors who can be trained within the nursing programme the government may not agree to pay simulation champions.

Activity 3:

depends on the willingness of the existing lecturers but is feasible with new lecturers for orientation.

Activity 4:

depends on the availability of the equipment and audiovisual devices. NE9

There is a need for resources, especially for the audiovisuals. (NE8)

How to use simulation equipment and devices might be challenged by a lack of applicable infrastructure and equipment. NE10 ***Activity 2, 4, 5:***

The programme can be developed, but in this university's current state of affairs, where or how can we get the simulation gadgets/equipment in the stated space of time? This is very relevant, but simulation requires that you have the equipment and materials available so that teaching the student is like or very close to the real and situated clinical context. Currently, our Clinical lab is wanting in terms of the infrastructure, simulation gadgets/equipment, medical materials, and supplies. Yet, there is no commitment from the management to improve the situation (at least in my NEI). So, for lecturers to be trained on using simulation equipment and fidelity calls for the same availability. The infrastructure of our CSL is an open plan without an observation room. Yet, assessment for simulation requires that the student practice as though in the real context without or with very minimal interference. Also, I suppose you also need to identify champions from the clinical agency for seamless integration (the purpose may be beyond the objectives of your study) (N5) ***Activity 8:***

It might be difficult to develop the simulation scenarios because of a lack of experience.

Activity 11:

Debriefing tools depend on the availability of funds. ***Activity 13****: there are not enough equipment and supplies in our simulation labs. There is also a lack of funding to equip the labs. There are no resources.*

Activity 14:

It is good to have standardised patients for students to have proper clinical real-time learning. However, the lack of funds to pay them might pose a challenge. (NE1)

If the government cannot pay for those (SPs), maybe students can be asked to volunteer for non-invasive procedures, and manikins can also be used. (NE2)

Requires a lot of motivation and incentives (NE9)

Requires support (financial).(NE9)

It might be difficult to recruit SPs as they may decline due to moral beliefs; however, training is feasible if the equipment is available. (NE10) ***Activity 15:***

Depending on the type of resources required, some institutions might be at zero. If membership requires subscriptions, then it may be a challenge to some institutions

Membership generally has financial and time commitments

Institutional Membership or affiliation is crucial for the sustainability of the change and accountability. However, the NEI I work for has difficulty supporting such endeavours, especially when such requires subscriptions, unless individual lecturers would be encouraged to join such on their own.

Activity 16:

Developing a simulation community to share best practices may take longer than the proposed timeline, considering the landscape. Maybe ideal in phase III.

Activity 17:

Requires a lot of resources which are currently not available.

Activity 19:

Partially agreeing to Faculty members obtaining formal training in simulation that leads to certification because it will sorely depend on their willingness and perceived need unless the training is provided within the University/Faculty(NE3)
Financial issues – training may need money(NE6)
Formal training may begin at the certificate level (NE8)
Those interested in certification training may not have funds or support, yet the training is very important.(NE1)
Requires only those involved in simulation. It is a speciality. (NE9)
A degree program might not be feasible since this is something new that is being introduced.(NE10) *Just a refresher course can assist.* (NE14) *General comments:*
Ongoing update of midwifery staff on simulation, yearly short training.
Other aspects of feasibility may be fine, but the financial aspect in our context may not be guaranteed. Developing a simulation community to share best practices may take longer than the proposed timeline, considering the landscape. Maybe ideal in phase III.

Domain B:
Activity 24:
I Partly agree because of the funding challenges at the university, which may take longer than anticipated Our institution is financially challenged, and as such, it would be difficult to fund and support simulation-based education
Activity 25:
It can be done when the need arises.
Activity 23, 24, 25:
Financial challenges and successfully attracting funds may not be guaranteed; Grants and/or external funding may not be sustainable.
Activity 26:
The institution has a shortage of staff. Hence, having committees may be difficult. It would be best to have a champion or a focal person.
Activity 27:
I think there is no need; we already know that simulation enhances midwifery education.
Does not require a review of the curriculum only. Requires a refurbished demo lab with equipment.
Activity 28:
The current Midwifery program offered by our department is competency-based. We are already implementing a simulation-based training program to help students achieve clinical competencies. This is why I have selected "partially agree" in some of these responses. It is because we are already doing these activities. Resources and funding have been the biggest barriers so far.
Activity 30:
Already available in the competency-based curriculum.
Activity 32:
The stated positions/cadres (e.g. clinical instructors) are non-extent (existent) in some institutions, and establishing them is a process. Workload:- unless more staff is hired, otherwise each lecturer is often loaded, and little room to extend a hand to assist in other lectures' courses ***Activity 34:***
Implementation would require a curriculum review, which might not be feasible within the set limits, and lack of funding contributes to delays.
Not all plans might have been actioned by then.
Activity 36:
Not all goals might have been actioned.
Activity 37:
The Midwifery Department has no control over the curriculum of other departments in the nursing program The issue of curriculum review plays a major role in integrating simulation into the programme and others. General comments:
Be careful not to develop a simulation-based education vision, mission, and strategy as a stand-alone. This would mean fragmentation of clinical learning. I see SBE as a pedagogic modality for clinical education. When treated differently, it would mean fragmentation of teaching and learning as you will have to develop classroom teaching's vision, mission and strategy. You have SBE with its own as well as clinical education. I totally agree with the integration. The emphasis on integrating SBE into the existing nursing education curriculum to improve deep and

authentic learning in the CSL needs to be accentuated and, ultimately, for the application and delivery of quality nursing/midwifery care, ensuring patient safety. The fear I have when it becomes a stand-alone, especially now as we move to online-based training, is that it can lead to nurse training done without the real clinical context, which can pose a problem as not all cases and patient responses can be simulated. Yet, the situated clinical context is necessary for authentic clinical reasoning, dispositional responses and subsequent actions with the therapeutic use of self (the virtues engraved in the nursing philosophy). Simulation in nursing cannot be treated as the "pilot kind of training", as not all human responses can be simulated. We need all three working in tandem for optimal learning. (N5)

Activity 18: *RE: the last bullet, the "other departments", must be included at the outset. For a productive move, I suppose using the curriculum to guide integration at all levels is objective enough and reduces resistance. Hence, involving everyone from the outset is crucial for acceptability, ownership and accountability.*

DOMAIN C:

Activity 41

low-cost mannequins cannot be used for long because they tear off quickly, and we may not meet the intended objectives.(NE4)

Even though they are low-cost, it would be difficult for the institution to do that without funding.(NE10)

Financial constraints will be a challenge even though the priority is low-cost equipment. (NE2)

Budgetary constraints to procure equipment. (NE12) ***Activity 41, 42, 43,44, 47, 48:***

*Depending on the availability of funds (*NE6)

The institution would need proper infrastructure and funds to procure the furnishings (NE10)

It is not feasible for the institution to buy technological devices unless there is funding.(NE12)

There are no funds to make any purchases. (NE2) ***Activity 46:***

It would be difficult for the institution to maintain the equipment without help with the maintenance.

Activity 47, 48

Such also requires space and staff retraining on using high-fidelity equipment. Fund availability is a major determinant.

Without funding, it would be difficult to purchase equipment.

It is impossible to procure high-fidelity mannequins due to a lack of funds and infrastructure where they can be placed.

General comments:

We may need to upgrade the CSL to create or design a "controls booth" for simulation assessment purposes. I do not want to sound pessimistic, but finances from our institution are. One/ the Department really needs to widely search and apply for GRANTS/ SPONSORSHIPS from local and international entities. Otherwise, the feasibility of this awesome plan may not be realised in the stipulated time. So, in my own opinion, the Grant or Sponsorship scouting must be one of the KEY activities if this wonderful plan is to be realised in the stipulated time.

DOMAIN D:

Activity 51*: Such also requires space and staff retraining on using high-fidelity equipment. Fund availability is a major determinant.* ***Activity 52, 53, 54, 55, 57:***

All are subject to the availability of funds (NE6)

The university should allocate the department premises since there is already a shortage of space in the existing demo labs. (NE8)

Having a building with 4 or more rooms will depend solely on space availability. (NE8)

Allocation of extra space to the existing structure may be required. (N12) ***Activity 53, 55***

The Midwifery department is located within a small physical space (land) and an infrastructure-challenged campus of the (X)(sic) University. Having the above separate spaces may not be feasible. Therefore, we use one space for all the above listed. (NE16) It might take more than 6 months. (NE2)

At 6 months is a preliminary [too early] (sic) stage such that having a fully functional infrastructure might not be possible. (NE10)

Activity 57:

The current simulation lab is too small and used by both midwifery and nursing.

Activity 58:

The building may be costly, but redesigning or renovating the current SL is challenging, especially because of space. (NE15)

Space may be available to build a simulation lab, but that would need much funding since the institution does not have money. (NE1)

Physical space might be an issue. (NE16)
There is no funding to build a new lab. (NE1)
Inadequate finances
The available space can be upgraded because building a simulation lab can take time, looking at the financial constraints the country is faced with. Yet, it is a very important programme that must be quickly implemented for our students. (NE11) General comment:
Approach both local and international organisations **DOMAIN E**:
General comment:
Phase 1- I guess this exercise must be ongoing, not only confined to the 1st phase, since the simulation is integrated into the ongoing learning.
Activity 64*- re Bullet 1: I suppose you need to review and evaluate the entire programme rather than students' needs only*

ANNEXURE 27: ROUND TWO CONTENT ANALYSIS

MEANING UNIT	CONDENSED UNIT	CODES	CATEGORIES
Domain A: Training/ Preparation of Ed ucators for Simulation			
Activity 4: Educators should be trained in how to use simulation equipment and audiovisual devices			
QUESTION: How can the institution ens re the availability of simulation equipment?			
OVERARCHING THEME: ST RATEGIES TO ENSURE THE AVAILABILITY OF SIMULATION EQUIPMENT			
– Lack of resources is a question of institutional financial management issues and priorities. – Respective Departments (X University Foundation and the Administration [HODs, Deans, and Directors]) must be proactive in seeking Donor funds – Academic staff, i.e. Deans, HODs, and Lecturers, seem to be overloaded with teaching load, leaving them with no time to engage in some form of fund-generating activities. – Training is feasible with support from the country's development partners. – There is limited financial flexibility where possible, loaning of equipment from hospitals – Seek external funding _from local and international companies and organisations. – This can be achieved through securing sponsorship – equipment availability, which may depend on donor involvement and lobbying from the Ministry of Education. – There is indeed a lack of equipment in our facilities. Due to the country's economic status, donors like UNFPA and other healthrelated NGOs can be contacted – Engage the Government and also source for funding from NGOs.	– Management lacks prioritisation of learning resources. – Management must be proactive in seeking donor funds. – Heavy workload limits academic staff's time to source funds. – Activity is feasible if support from development partners is available. – Loaning of equipment from hospitals. – Seek funding from local companies and international organisations. – Secure sponsorship. – Involve donors and lobby the Ministry of Education. – Contact donors like UNFPA and other health-related NGOs. – Engage government and NGOs for funding.	– Management must prioritise seeking donors to fund resources. – Source funds from donors – Source support from partners. – Academics should create time to source funds. – Seek support from a partner. – Source equipment from the hospital – Seek funds from external donors – Sponsorship – Seek donors – Lobby Ministry of Education – Seek donors – Engage government and NGOs	– Management to prioritise sourcing funds for resources. – Seeking funding from local companies, international donors (UNFPA), and partners/NGOs – Source equipment from hospitals. – Applying for grants – Lobbying Government (Ministry of Education)

Activity 14: Recruitment and Training of Standardised Patients (SPs)
Comment: Training educators on how to recruit and train standardised patients is intended to upskill the educator; please re-evaluate and advise
OVERARCHING THEME: FACILITATORS AND BARRIER TO USING STANDARDISED PATIENTS

– It is a good strategy in the abstract, but infeasible and financially unsustainable in our setting. – Given the cultural aspect, volunteers can be sourced from the various people used in promoting current health programmes in the country, e.g. community people already involved in various health programmes. – SPs may need to be compensated for their input, perhaps. – It is **feasible** to train educators on how to recruit and train standardised patients because the institution has education specialists. – The use of SPs can be **feasible** if incentivised. – So, to me, this activity is feasible. However, I think you first have to develop the ethical guideline for recruitment and validate it through the QUALITY assurance mechanisms by ESA to ensure that candidates are not high risk and the school is somehow protected. – Rather than pay, maybe the departments could provide tokens of appreciation for the SPs, and their use could be limited to cut costs/expenses. – I recommend getting consent from interested students if it is non-invasive. – Training SPs is feasible as long as there is a commitment to sustainability, and it will upskill the educator. – It is important to recruit and train standardised patients __which might be **feasible.** – It may be **feasible** to train educators on how to recruit SPs. However, I do not see it working long-term if they have no incentives.	– Good but unfeasible due to financial constraints. – Volunteers can be sourced from current health programmes. – SPs may need to be compensated – Feasible to train educators on the SPs recruitment process. – Using SPs can be feasible if incentivised – It is feasible, but ethical guidelines should be developed. – Departments could provide tokens of appreciation for the SPs rather than payment. – Using SPs should be limited to cut costs/expenses – Involve students rather than SPs for non-invasive procedures. – It is feasible if there is a commitment to sustainability and upskilling of educators. – Feasible to recruit and train SPs. – It is feasible to train educators on using SPs. – It is not sustainable if there are no incentives. – SPs are needed, and the government should be contacted for payments. – It is a good idea and will help assess student performance.	– financial constraints. – It is possible to source volunteers. – Compensation needed – Require trained educators. – Incentives needed. – Develop ethical guidelines – Token of appreciation. – Limit use to reduce costs. – Expenses – Use students – Commitment to ensure sustainability. – Train educators. – Feasible – Train educators – Source funds from the government to pay SPs. – Incentivise to ensure sustainability. – Seek support from the government for paying SPs. – Helpful in providing feedback on student performance. – Train educators. – Incentivise-airtime	Facilitators: – Volunteers – Students – Management commitment – Token of appreciation – Support from government – Limit the use of SPs – Trained educators – Incentives Barriers: – Financial constraints

– There is a need for the SPs; let us not assume that government cannot pay them. The government must be contacted on the issue. – This can be a good idea because besides being very good at assessing students' performance, they can evaluate the effectiveness of the curriculum, see where students are doing well and identify areas that need improvement. – True; there is a need to capacitate educators to recruit and train SPs for easy simulation. However, if SPs are unavailable, some alternatives can be used depending on the type of procedure to be demonstrated. About – the recruitment of standardised patients, my advice is that if patients are not willing to participate, they may be promised a small incentive like airtime.	– It is necessary to prepare educators to train and recruit SPs. – If patients are not willing to participate, they may be promised a small incentive like airtime		
Activity 19: Faculty members should obtain formal training in simulation that leads to certification (certificate, diploma/degree). **Comment:** The formal training that leads to certification can be through in-service training, workshops, short courses and programmes that lead to certification. It is intended for upskilling educators involved in clinical teaching and learning using simulators; please evaluate and advise			
OVERARCHING THEME: PREFERRED LEVEL OF FORMAL TRAINING IN SIMULATION PEDAGOGIES			

– I maintain that training and certification do not seem essential and relevant in our current setting, given our equipment and the scope of our training. First, we advance our clinical labs and programmes. – Formal training leading to certification is only necessary for the key simulators, e.g. those in charge of simulation labs; the rest of the nurse/ midwifery educators only require inservice training as every educator is responsible for clinical practice for students. – **Certification is required** since this is a distinct speciality	– training and certification do not seem essential and relevant in our current setting, given our equipment and the scope of our training – Formal training leading to certification is only necessary for the key simulators, – Training is for those in charge of simulation labs; – the nurse/ midwifery educators only require in-service training as every educator is responsible for clinical practice for students	– Training educators is not a priority to equipment currently. – Training is not necessary for academic staff. – Formal training for lab officers. – Nurse/midwifery educators require inservice training only. – Certification is required. – Workshops and on-thejob training – CPD on-the-job training	– In-service training – Workshops – Short courses – CPD – Recommendations: – Standardised training program – Certification for quality assurance

– Education specialists in the institution may facilitate workshops and on-the-job training on simulation for educators. – If the training is provided as CPD on the job, **then it is feasible**; I believe the Faculty will be interested. – Certification might have financial challenges, **but it would be best to secure sponsorship** so that all lecturers are trained. – The training can indeed be part of in-service training or workshops since it may be ideal only for those involved in skill transfer; however, the certificate should be valuable beyond the university in terms of recognition. – **I agree that formal training that leads to certification can be through in-service trainin**g, workshops, and short courses. – **Short courses and workshops are feasible**; that would be a good start. – Workshops and short courses **can be organised with certification to capacitate educators** and registered nurses. – It is **feasible to conduct workshops and inservice training for all faculty**, including those requiring short courses or higher certification. – It is pointless to have the equipment and not be able to utilise them. Any educator who needs to be equipped with the skill can be workshopped. – There should be a standardised training program that includes a practical course; scenarios have to be included in this training. – True; a short course should be provided to enhance the skills of those involved in simulations – Certification is required for quality assurance	– certification is required since it is a speciality. – The institution may facilitate workshops and on-the-job training on simulation for educators. – Feasible if the training is provided as CPD on the job – The training can be part of inservice training or workshops. – Formal training that leads to certification can be through inservice training, workshops, and short courses. – Short courses and workshops are feasible. – Workshops and short courses can be organised with certification to capacitate educators – feasible to conduct workshops and in-service training for all faculty and those who require short courses or higher certification. – Any educator who needs to be equipped with the skill can be workshopped. – There should be a standardised training programme. – A short course should be provided to enhance the skills of those involved in simulations. – Certification is required for quality assurance.	– In-service training or workshops – In-service training, workshops, short courses. – Short courses and workshops – Workshops and short courses. – It is feasible to conduct workshops and in-service training for all faculty. – Workshopped – There should be a standardised training programme. – Short course. – Certification is required for quality assurance.	

DOMAIN C: SIMULATION EQUIPMENT

Activity 41: Prepare a budget to procure mannequins, prioritising buying low-cost mannequins (Mama Natalia and Neo Natalia, task trainers) at this phase if there are financial constraints.

Question: Do you think preparing a budget plan for procuring low-cost simulation equipment is feasible?

OVERARCHING THEME: FACTORS PROMOTING PROCUREMENT OF MANNEQUINS

– In my view, that is **very feasible**. I disagree that we totally do not have money at all. It is more about priorities. The Faculty Executive has a duty to press on the admin and make them understand the importance of that equipment in clinical teaching. – Yes, **it is feasible**. This forms the beginning of establishing a simulation lab. – It is **feasible**, however, that the issue could be prioritised by higher management. – It is **feasible to** prepare a budget to purchase low-cost simulation equipment. – It is **feasible** if you can source external funding. – **Yes**, it would be the first step towards making the programme a reality. – Preparing the budget is **feasible** once everyone involved has been made aware of its importance. – Most of our institutions are financially challenged; preparing a budget for buying simulation equipment is not feasible. What can save the institutions is to apply for funding to buy the equipment. – **Preparing a budget can be done** and has been done frequently in our institution, but it has not yielded the desired results. – **Yes, it is feasible.** The local government should be engaged to prioritise education in collaboration with its stakeholders to ensure sufficient funding for training institutions. – Yes, it is feasible. – Yes, it is feasible. –	– The Faculty Executive has a duty to press on the admin and make them understand the importance of that equipment in clinical teaching. – It is feasible, and this forms the beginning of establishing a simulation lab. – It is feasible, however, that the issue could be prioritised by higher management. – Preparing the budget is feasible once everyone involved has been made aware of its importance. – . What can save the institutions is to apply for funding to buy the equipment. – The local government should be engaged to prioritise education in collaboration with its stakeholders to ensure sufficient funding for training institutions.	– The Faculty Executive should inform institutional management about the needed clinical teaching equipment. – The issue could be prioritised by higher management. – Preparing the budget is feasible once everyone involved has been made aware of its importance. – The institutions must apply for funding to buy the equipment. – Local government and stakeholders should be engaged to prioritise education needs.	– Faculty Executive and higher management commitment is needed. – Get the buy-in of everyone (stakeholders). – Apply for grants/funding. – Engage local government and stakeholders.

– Yes, a budget can be made, but the challenge with low-cost equipment is that they might be of poor quality. – Having a budget is good as it is the first step in working towards ordering the needed equipment, and making the request for equipment is better than not making an effort at all.			
Activity 42: Room furnishings (e.g., beds, carts, monitors, medical instruments) **Question:** What alternative options could you suggest for your institution to acquire basic hospital/clinical equipment for the simulation laboratory?			
OVERARCHING THEME	**STRATEGIES TO FURNISH SIMULATION LEARNING ENVIRONMENT**		

– I still see it as **feasible.** We do have Partners-in-Health in the country. We do not seem to be actively scouting for funds out there. Examples are WHO, ICAP, UNDP, and UNICEF. – Loaning from hospitals and clinics. – We can request organisations to donate funding to source the equipment. – Alternatively, we may request that private hospitals donate functional equipment they no longer use in patient care. – External funding and sponsorships. – Donations. – The institutions may also need to partner – with local companies to request funds from the Company's Community Service to help our institutions buy the basic equipment. – Donors and some hospitals can be contacted as equipment is kept in their store rooms and unused. – Grants applications and proposal writing to potential sponsors and the local government. – Donor funding – Equipment can be sought from the UN and other similar agencies –	– We do have Partners-in-Health in the country. We do not seem to be actively scouting for funds out there. – Loaning from hospitals and clinics. – Request organisations to donate funding to source the equipment. – Request private hospitals donate functional equipment they no longer use in patient care. – External funding and sponsorships – Donations. – The institutions may also need to partner with local companies to request funds from the Company's Community Service to help our institutions buy the basic equipment. – Donors and some hospitals can be contacted as the equipment is kept in their store rooms and unused. – Grants applications and proposal writing to potential sponsors and the local government. – Donor funding	– Actively scouting for funds from Healthcare Partners. – Loaning from hospitals and clinics. – Request organisations to donate funding to source the equipment. – Request unused equipment from private hospitals. – External funding and sponsorships – Donations. – Request funding from local partners to buy equipment. – Donors – Request unused equipment from hospitals. – Apply for grants. – Donor funding.	– Apply for grants to fund equipment. – Request unused equipment (donations) from hospitals and clinics.

Activity 43: Technological devices and audiovisual systems

Question: *What suggestion would you g ive to ensure the availability of funds for procuring technological devices such as computers and audiovisual devices to ad ance simulation-based education in your institution?*

OVERARCHING THEME: STRATE GIES TO PROCURE TECHNOLOGICAL DEVICES AND AUDIOVISUAL SYSTEMS

– I maintain that **it is feasible**. (1) We should charge enough tuition to cover our training needs, including procurement of that equipment if necessary, and then ensure that the collected revenue is channelled to the rightful intended purpose. – The departments through the university structures should develop relevant proposals for funding and submit them to the country's corporate as well as development partners through the Ministry of Health. – Increase the tuition for nursing science. – A budget must be prepared on time so the institution spares funds to purchase the required equipment. Another alternative would be to purchase low-cost devices. – External funding and sponsorships. – Secure sponsorship. – Our faculties and departments need to make – deliberate partnerships and network with other universities so that we can request funding for the technological devices. – Alternatively, they (institutions) may help by sharing what they already have in their institutions. – Grants applications, proposal writing to potential sponsors and the local government, and engaging in research work for the government and non-government organisations. – Engage in income-generating projects and donor funding.	— We should charge enough tuition to cover our training needs and ensure that the collected revenue is channelled to the rightful intended purpose. — The departments through the university structures should develop relevant proposals for funding and submit them to the country's corporate and development partners through the Ministry of Health. — Increase the tuition for nursing science. — A budget must be prepared on time so the institution can spare funds to purchase the required equipment. — External funding and sponsorships. — Secure sponsorship. — Faculties and Departments need to make deliberate partnerships and network with other universities so that we can request funding for the technological devices. — Institutions may help by sharing what they already have in their institutions.	— Increase tuition to meet the financial resource needs of the institution. — Departments should develop proposals requesting funding from the country's corporate and development partners through the Ministry of Health. — Increase tuition fees. — Prepare the budget for equipment on time. — External funding and sponsorships. — Secure sponsorship. — Faculties and Departments should develop partnerships and network with other universities so that we can request funding. — Institutions may share the resources with other institutions. — Develop proposals for grant applications to potential sponsors and the local government,	— Increase tuition fees. — Apply for grants-sought national grants. — Increase tuition fees — Prepare a budget for funding equipment. — Develop proposals for grant applications to potential external sponsors. — Forge linkages and networks with potential funders. — Sharing of educational resources within institutions. — Engage in research activities with potential sponsors and local government. — Engage in incomegenerating projects.

	— Grants applications, proposal writing to potential sponsors and the local government, — Engaging in research work for the government and nongovernment organisations. — Engage in income-generating projects and donor funding.	—Engage in research with the government and NGOs to secure funds. —Engage in incomegenerating projects.	
DOMAIN D: SIMULATION INFRASTRU CTURE:			
Activity 51: The department should allocate premises for building the simulation laboratory or renovating/redesigning an existing structure **Question:** How can the issues regarding the allocation of premises for the simulation learning environment be addressed within the current financial situation?			
OVERARCHING THEME: INFRASTRUCTURE DEVELOPMENT NEEDS			

– The Faculty Planning Committee needs to press on the office of the Physical Planner for a possible moving of the Faculty to a new and spacious place. – The **current demo labs can easily be converted** into such an activity once the decision is made. What is only required is the relevant equipment and resources. – The department may formally request the relevant structures in the institution to allocate space for building a simulation laboratory on campus. – Work with the planning department/committee, share your ideas, and have a proposed plan on how the current CSL could be altered/renovated to enable simulation. – Seek funding for infrastructure from companies known to support such activities: MTN, Build It, SPTC, etc. – Using existing Labs to ensure wasted space is utilised, i.e. storage or including adjacent classrooms as Lab space. – The university should allocate the department premises.	– The Faculty Planning Committee needs to consider possible moving of the Faculty to a new and spacious place. – The current demo labs can easily be converted into such an activity once the decision is made. – Departments may formally request for an allocation of space for building the lab. – Share ideas with the Planning Department and a proposed plan on how the current CSL (clinical simulation learning) could be altered/renovated to enable simulation. – Seek funding for infrastructure from companies known to support such activities: MTN, Build It, SPTC. – Using existing Labs to ensure wasted space is utilised, i.e.	– Consider relocating the Faculty to a new and spacious setting. – Current demo labs can easily be converted. – Formally request the relevant structures in the institution to allocate space for building a simulation laboratory on campus. – Propose a plan on how the current CSL (clinical simulation learning) could be altered/renovated. – Seek funding for infrastructure from companies known to support such activities. – Using existing Labs to ensure wasted space is utilised.	– No space, relocate Faculty. – Redesign existing laboratories. – Allocate building premises on campus. – Redesign existing structure. – Seeking funding from interested companies. – Redesign/repurpose existing structure.

– The need for funding is a priority, and institutions can avail premises if there is funding to build the simulation labs. – The cheapest way is to buy containers that are used for building houses. It can be much cheaper for the institutions. – A space can be created in the clinical skills lab. – It is solely dependent on the availability of space and funds. – Utilisation of the available structures.	storage or including adjacent classrooms as Lab space. — The university should allocate the department premises. — The need for funding is a priority, and institutions can avail premises if there is funding to build the simulation labs. — The cheapest way is to buy containers that are used for building houses. — A space can be created in the clinical skills lab. — Utilisation of the available structures.	— The university should locate the building premises. — Sourcing funding should be a priority, and building space allocation will not be an issue. — Buy containers that are used for building houses. — A space can be created in the clinical skills lab. — Utilisation of the available structures	— Allocate building premises. — Source funds to allocate building premises. — Buy containers. — Redesign/repurpose existing structure. — Redesign/repurpose existing structure.
Activity 52: *Observation room* estion: How feasible is it to rearrange **Qu**the layout or repurpose existing structures to create a space for the learners?			
OVERARCHING THEME: HINDRANCES CREATING AN EXTRA SPACE OBSERVATION ROOM			

– I do not think it is feasible. The students are too many, and the space is too small and used for multipurpose. – A **link can be** made to a different room already in existence, e.g., the current Health Education room is underutilised. – Existing structures can not adequately meet the simulation needs of currently enrolled students. – **It is possible to rearrange the existing structure and install** a big television screen that can be used for observations. – A booth can be created, and **it is feasible**, I believe. – We already conduct classes in the demo lab, which combines theory and practice; hence, it is **possible to repurpose the space**. – The skills laboratory is small, and there would be no space for an observation room.	— The students are too many, and the space is too small and used for multipurpose. — A link can be made to a different room already in existence. — Existing structures can not adequately meet the simulation needs. — It is possible to rearrange the existing structure and install a big television screen that can be used for observations. — A booth can be created. — We already conduct classes in the demo lab, which combines theory and practice.	— students are too many, — the space is too small and used for multipurpose. — Link can be made to a different room. — Install a big television screen that can be used for observations. — Create a booth. — Already conduct classes in the demo lab. — The skills laboratory is too small to repurpose. — There is no space. — It is impossible to rearrange existing structures. — It is not possible because of their size.	— Too many students. — No space — Buildings can be linked. — Observation screen/window. — A booth can be made. — Space can be rearranged. — No space; too small — No space — No space — No space; too small

– Yes, it is possible, as we can use our demonstration rooms for assimilation [sic] purposes. – Since there is no space, it is impossible to rearrange the existing structures to create space for an observation room. We need new premises for a fully functional simulation lab. – The existing structures are too small for that. – Yes, it might not be possible because of their sizes. – Some are congested already, thus not possible for re-arrangement. – It is possible because that is where practical skill is taught, Yes, it is possible.	— The skills laboratory is small, and there would be no space for an observation room. — There is no space; it is impossible to rearrange the existing structures to create space for an observation room. — We need new premises for a fully functional simulation lab. — It might not be possible because of their sizes. — Congested already, thus not possible for re-arrangement — It is	— We need new premises for a fully functional simulation lab. — It is congested already. — Practical skills taught in the lab.	— No space — No space (congested) — Space can be arranged.

–	possible because that is where practical skill is taught		

Activity 53: ***Debriefing room***

Comment: Debriefing is a critical compo ient in a clinical course, needed to facilitate learners' meaningful learning after the experience. It can take place in a classro om; please re-evaluate and advise.

OVERAR HING THEME: DESIGNATED SPACE FOR DEBRIEFING

– I do not see the need for, and the feasibility of, having a separate room specifically for debriefing in our setting. – The **observation room can also be used as the debriefing room**. – **I agree that debriefing** can take place in a classroom. – **Debriefing can occur in a classroom** or to individual students in an educator's office. – For feasibility, the office is sufficient. – You do not need a spare room created for this exercise. However, the office in the CSL can be repurposed at the time of need. – Debriefing only needs a specific time allocated, which can be done compared to a specific room. – for smaller groups of students, all the activities can be done in one Room – YES, debriefing is a critical component in a clinical course, needed to facilitate learners'	– There is no need for and the feasibility of a separate room specifically for debriefing in our setting. – The observation room can also be used as the debriefing room. – Debriefing can take place in a classroom. – Debriefing can occur in a classroom or to individual students in an educator's office. – You do not need a spare room created for this exercise. – However, the office in the CSL can be repurposed. – Debriefing only needs a specific time allocated, which can be done compared to a specific room.	– There is no need for a separate debriefing room. – Use the observation room for debriefing as well. – Debriefing can take place in a classroom. – Debriefing can take place in a classroom. – There is no need for a separate debriefing room. – Repurpose the current clinical simulation learning structure. – There is no need for a separate debriefing room. – It can take place in a classroom.	– Use the same space. – Use the same space. – Use a classroom. – Use a classroom. – Use same space – Use the same space. – Use the same space.

– meaningful learning after the experience. It can take place in a classroom. – Using one class as a debriefing room is a good idea – Debriefing can take place in a classroom after the assimilation [sic] period. – Debriefing is critical in learning. In our current simulation labs, it is not feasible to have a room for that. However, alternative rooms like lecture rooms can be made for debriefing. – Yes, classrooms can be utilised if there is no space. – Debriefing is important as a simulation experience can stir emotions. A classroom will not be a problem because the students have to be grouped. – Yes, though ideally, it should have a designated space to ensure privacy. – Since it is a critical component, it has to be done; hence, a classroom might be an option if it has been made conducive to suit the need.	– It can take place in a classroom. – Using one class as a debriefing room is a good idea – Debriefing can take place in a classroom – In our current simulation labs, it is not feasible to have a room for that. However, alternative rooms like the lecture rooms can be made for debriefing. – Classrooms can be utilised if there is no space. – Debriefing is important as a simulation experience can stir emotions. A classroom will not be a problem because the students have to be grouped. – It should have a designated space to ensure privacy. – Since it is a critical component, it has to be done; hence, a classroom might be an option if it has been made conducive to suit the need.	– Alternative rooms, like the lecture rooms, can be made for debriefing. – Classrooms can be utilised. – It should have a designated space to ensure privacy. – A classroom might be an option if it has been made conducive to suit the need.	– Use a classroom – Use a classroom. – Use a classroom. – Designate a debriefing room. – Use a classroom.
Activity 58: *Build the simulation learning space for the programme* **Question**: *What is your opinion regarding upgrading the existing structure than building a new simulation learning space?*			
OVERARCHING THEME: RATIONALE FOR UPGRADING THE EXISTING STRUCTURE			

– The available space can be **upgraded** because building a simulation lab can take time…due to financial constraints. – The building might take a long time or even not be finished, but **upgrading** whatever is present might take a short time. – Building a new structure from the ground up will take a very long time with the current challenges. Efforts may go towards **refurbishing** the existing space.	– Available space can be upgraded because building a simulation lab can take time. – Building a structure might take a long time or even not be finished, but upgrading whatever is present might take a short time. – Building a new structure from the ground up will take a very	– Upgrading is feasible and cost-effective, and less time-consuming. – Upgrading is feasible and can be done within a short space of time. – Building a new simulation centre will take a long and delay the initiative.	– Cheap – Less time. Time-saving. – Time-saving. –
– Starting assimilation[sic] as soon as possible would be beneficial to start by **renovating** available buildings and later building when finances are available. – The labs are too small, and upgrading them to a good standard is difficult. At the same time, building new labs is required even though it may take a long time and is based on funding availability. – **Upgrading the available space** and asking for donations for the ISO containers or Prefabs can be okay. – Yes, it will take a long. So **upgrading the available structures** is an option.	long time with the current challenges. – Starting assimilation[sic] as soon as possible would be beneficial to start by **renovating** available buildings and later building when finances are available. – The labs are too small, and upgrading them to a good standard is difficult. At the same time, building new labs is required even though it may take a long time and is based on funding availability. – Upgrading the available space and asking for donations for the ISO containers or Prefabs – It will take a long time to build a new learning space. So, upgrading the available structures is an option.	– Renovate to start simulation as soon as possible. – Labs are too small to be renovated. Instead, build new labs even if it takes too long. – Upgrade available space and ask for donations for containers/prefabs. – Upgrade the available structures.	– Time-saving – Current labs are too small; build new labs. – Upgrade and donations for containers/prefabs. Time-saving –

ANNEXURE 28: TURNITIN REPORT

Turnitin Shongwe

by Sithembile Siphiwe Shongwe

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