CHALLENGES FACING NURSE EDUCATORS IN THE IMPLEMENTATION OF HIGH FIDELITY SIMULATION AT A PUBLIC NURSING COLLEGE

By

JACINTA MARIA KAPP

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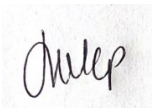
DECLARATION

I, Jacinta Maria Kapp, hereby declare that the dissertation submitted for the degree qualification: Master of Nursing, at the University of the Free State, is my own independent work and has not been previously submitted by me for a degree to another university of faculty. I further waive my copyright of the dissertation in favour of the University of the Free State.

Signature: 

Jacinta Maria Kapp

Date: 30 November 2020

DEDICATION

For Luky, Lucy and Mary

"Our greatest weakness lies in giving up. The most certain way to succeed is always to try just one more time" – Thomas Alva Edison

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LANGUAGE EDITING

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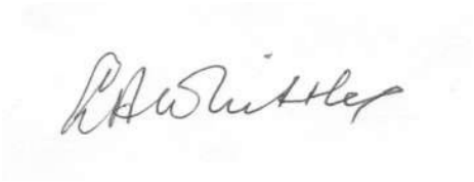
I made a number of suggestions in terms of the linguistic and punctuation contents of the dissertation which I submitted to the magistra for consideration and application if she deemed them appropriate, which was duly accomplished.



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ABSTRACT

The new nursing curriculum, Regulation 171 for introduction at Nursing Education Institutions throughout South Africa, as approved by the South African Nursing Council and Council for Higher Education, stipulates that 20% of practical hours are to be spent in simulation laboratories. High fidelity simulation is available in varying degrees at all the campuses of the public nursing education institution selected for this study, yet it is not formally being utilised. The purpose of this study was to identify the challenges that nurse educators perceived to be standing in the way of their implementing high fidelity simulation at this nursing education institution.

A qualitative, explorative, descriptive research design was employed and data was collected by means of the nominal group technique. The empirical data was analysed and themes, categories and subcategories were identified.

The three main themes identified were stakeholders, readiness of staff and high fidelity simulation. Stakeholders' four categories included finances, human resources, physical and material resources and attitudes. The three readiness of staff categories were identified as nurse educators' training, empowerment/autonomy and students' training. The three categories, responsibilities of the high fidelity simulation manager, standards of high fidelity simulation sessions and the information technology control centre were identified under the theme high fidelity simulation.

Key recommendations included the coming together of all stakeholders for budgeting and financial purposes, the careful management of human resources, early consultation of nurse educators, comprehensive training and preparation of nurse educators for the implementation of high fidelity simulation and the availability of a fully functional information technology-controlled simulation laboratory, complete with control room.

Key words: challenges, nurse educators, high fidelity simulation, implementation, nurse education institutions.

LIST OF ABBREVIATIONS

CHE	Council on Higher Education
ETQA	Education and Training Quality Assurer
FSSoN	Free State School of Nursing
HSREC	Health Science Research Ethics Committee
HFS	High Fidelity Simulation
NCSBN	National Council of State Boards of Nursing
NDoH	National Department of Health
NEI	Nursing Education Institution
NGT	Nominal Group Technique
NMC	Nursing and Midwifery Council
NQF	National Qualifications Framework
SANC	South African Nursing Council
SAQA	South African Qualifications Authority
WIL	Work Integrated Learning

CLARIFICATION OF CONCEPTS AND CONTEXT OF STUDY

The purpose of this research was to gain insight into challenges nurse educators face in implementing high fidelity simulation (HFS) at the three campuses of the Free State School of Nursing (FSSoN). To review the literature surrounding the importance of HFS and the need for its formal implementation into the South African field of nursing education, the following concepts require clarification: challenges, high fidelity simulation, nurse educator and nursing school.

Challenges

The Macmillan Dictionary (2019:online) defines challenges as “something that needs a lot of skill, energy and determination to deal with or achieve, especially something you have never done before”. A challenge according to Mutshatshi *et al*. (2018:2) is a difficult situation and/or problems at a given time, experienced by nurses.

In this study the word “challenges” will refer to the difficulties that nurse educators considered to be hampering the introduction and implementation of HFS at the NEI as part of the new nursing curriculum 2020. These challenges are identified by the nurse educators themselves.

High fidelity simulation

Meakim *et al.* (2013:S6) use the definition of HFS as “experiences using full-scale computerised patient simulators, virtual reality or standardised patients that are extremely realistic and provide a high level of interactivity and realism for the learner”.

In this study, HFS will be used to describe the computerised patient simulators or manikins recommended in literature to use with regard to the practical training of

nursing students as a learning and teaching strategy. One campus has been equipped with five HFS manikins, whereas the remaining two have one manikin each.

Nurse educator / Lecturer

Mosby (2009:1300) defines a nurse educator as “a registered nurse whose primary area of interest, competence, and professional practice is the education of nurses”. The nursing educator incorporates the concepts of teacher, leader and mentor within the nursing environment.

The nurse educators selected to participate in this study have all successfully completed the required post-graduate additional qualification in nursing course as stipulated by the South African Nursing Council and Council on Higher Education (CHE), while they have been registered with SANC and are employed as nursing educators at the NEI and responsible for the implementation of HFS.

The participants mostly referred to nurse educators as lecturers. For purposes of this study, the researcher refers to nurse educators, and only to lecturers when quoting participants’ responses.

Nursing education institution / Public nursing college

In the Higher Education Act 101 of 1997 a nursing education institution is described as any such institution established or declared a nursing education institution under the act and accredited by the South African Nursing Council. This act was later amended to include public nursing colleges.

The NEI and its three campuses referred to in this study was established after the Free State Nursing Education Act 15 of 1998 transformed all the public nursing colleges in the Free State into one NEI. For purposes of this study the NEI will be referred to as “a public nursing college” in order to avoid confusion between the college and

university nursing training institutions. In respect of the literature of this study, the terms public nursing colleges and nursing education institutions will be used jointly.

Context

The public nursing college selected for this study was tasked with introducing HFS into its new undergraduate curriculum 2020. The public nursing college is divided into three campuses namely: Campus A, Campus B and Campus C. The map in Figure 0.1 illustrates where the campuses are situated. Each of these campuses has its own campus head, or dean. The principal, who is responsible for the entire institution, is stationed at Campus A. The public nursing college complies with all the regulatory requirements necessary for a Nursing Education Institution (NEI) and its accreditation by the South African Nursing Council (SANC) and Council of Higher Education (CHE) was in the process of being updated. The ethical and professional obligations of the campuses are to ensure the development and implementation of comprehensive and effective simulation, including HFS, at their campuses. Researching the anticipated challenges facing campus nurse educators with respect to the implementation of HFS, should initiate and support the beneficial process of implementation of the programme for all stakeholders.

In 2017, one of the campuses included in this study received a grant from Internet Content Adaption Protocol (ICAP) as part of the Nursing Education Partnership Initiative (NEPI) project. This grant included a HFS laboratory, complete with five HFS manikins, necessary technology, furniture and other required equipment. The NEI has a responsibility towards the Department of Health, the South African Nursing Council and, most crucially, to the nursing students, so as to ensure this implementation is carried out successfully. Although not grant recipients, the remaining two campuses

included within this study each have a manikin for use in assisting students with regard to simulation. HFS is therefore accessible at all three campuses.

Figure 0.1: Adapted map of the Free State Province of SA indicating campuses of NEI (SA Places, 2020).

The researcher is a nurse educator at one of the campuses of the public nursing college chosen for this study. As such, permission was requested and readily obtained from all participants for the researcher to be present during nominal group sessions.

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CHAPTER 1: OVERVIEW OF THE STUDY

"Nothing in life is to be feared, it is only to be understood. Now is the time to understand more, so that we may fear less".

Marie Curie

1.1 Introduction

Nurse educators have been responsible for ensuring quality training to future generations of professional nurses. Internationally, the exponential pace of change within 21st century technology and virtual reality encouraged the implementation of simulation as an effective learning strategy for nursing students (Botma *et al*. 2014:7,108). High fidelity simulation (HFS) in nursing education has achieved global recognition as a successful learning and teaching strategy (Bailey & Mixer, 2018:66). Many international nursing boards acknowledged the importance of simulation in learning and teaching (Alexander *et al.* 2015:39-40). This led to an increase in the amount of time allocated to simulation in nursing curricula.

The implementation of high fidelity simulation as a nursing education strategy proposed an increase of practise opportunities on manikins in realistic clinical scenarios, which proved vital for student experience, yet difficult to find within the clinical area itself (Bailey & Mixer, 2018:65; Janse van Vuuren *et al.* 2018:1; Kim *et al*. 2016:1). The students' learning experiences and cognitive judgemental skills might be improved, which would lead to more confident and capable nurses and optimal patient care (Guise *et al*. 2012:412; Nel & Stellenberg, 2015:176), as well as increased patient safety (Lazzara *et al*. 2014:27; Peterson *et al.* 2017:254; Pinar & Peksoy, 2016:137). Nursing educators, therefore, needed to remain abreast of current developments in the field of simulation technology and its increasing value as a teaching strategy.

South African nurse educators face an exciting and challenging new era in the dynamic field of nursing education. The proposed introduction and implementation of the new nursing curricula in 2020 and the move to higher education signalled the introduction of profound changes in the South African nursing education (Armstrong & Rispel, 2015:1). Simulation, which includes HFS, had not previously been pertinently included in the undergraduate nursing curriculum since it was a relatively new and rapidly developing pedagogy in learning and teaching in South Africa. The transition of nurses training to higher education encouraged nurse educators in South Africa to ensure that their teaching methods were directly aligned with those required by the Council of Higher Education (CHE), and South African Nursing Council (SANC), as well as with international nursing training trends, which increasingly featured HFS.

Little was known of the challenges facing South African nurse educators in implementing HFS, as they had not yet been thoroughly explored. Investigating such potential challenges would serve to identify these and be of assistance to the effective implementation of HFS which has become mandatory.

1.2 Problem statement

Nurse educators face challenges in implementing HFS in the new curriculum. Unless these potential challenges were investigated, such an omission might contribute to the unsuccessful endeavour to the implementation of HFS, and even to its non-implementation. The new undergraduate nursing curriculum for registration as a nurse (South African Nursing Council, 2013) set for introduction in 2020 by the South African Nursing Council stipulated that all new programmes must include clinical hours spent in simulation or skills laboratory as part of work-integrated learning (WIL) (South African Nursing Council, 2020). WIL is the combining of formal learning with student

exposure to the world-of-work in their chosen profession (Jackson, 2015:350). The changes from the old undergraduate nursing curriculum to the new undergraduate nursing curriculum brought many new challenges in the educator's learning and teaching environment. Concepts such as HFS and WIL were new to them, bringing emotional turmoil and other issues that needed to be explored and addressed. The researcher identified the need nurse educators had for identifying and investigating these challenges so that they could be addressed. This study investigated the anticipated challenges nurse educators faced with regard to the implementation of HFS.

1.3 Research purpose

Research purpose is a succinct statement clearly specifying what the researcher wants to accomplish with this research (Botma *et al.* 2010:287; Brink *et al*. 2012:62). The purpose of this research study was to describe challenges nurse educators perceived to be facing with regard to the implementation of HFS at a public nursing college.

1.4 Research question

The research question for this study was: What are the challenges facing nurse educators with regard to the implementation of HFS at a public nursing college?

1.5 Research paradigm

Each research study has a unique research paradigm with its own norms and standards which explains the researchers' *modus operandi* with regard to research

along four magnitudes: ontology, epistemology axiology and methodology (Botma *et al.* 2010:287; Terreblanche *et al*. 2006:6, Killam, 2013:6). Within this study, **constructivism** as a worldview characteristic of qualitative research was applied.

The **ontological** question to be answered was related to **ontological assumptions** which were concerned about the nature of reality, what is. Nurse educators needed to examine their perceptions on how things really were and how things really worked. Qualitative research conformed to ideas that reality is socially constructed and that questioning is inevitably value-laden (Cleland, 2017:62; Scotland, 2012:9). In this study, the ontological question, or nature of reality, comprised the challenges that nurse educators working at this NEI found to be standing in their way of successfully implementing HFS.

The **epistemological** question was linked to **epistemological assumptions** which were concerned with the nature of knowledge which cannot be measured directly – it only existed as experienced by people and by the observer. In other words, what it means to know (Cleland, 2017:62; Scotland, 2012:9). The epistemology of this study will be of assistance to the researcher in gaining new knowledge on what challenges nurse educators experience.

The **axiological** question to be answered was related to **axiological assumptions** which were concerned with the nature of ethical behaviour (Killam, 2013:6), made values explicit, and in the process raised the participants' awareness of a multiplicity of meanings which thus acknowledged that their backgrounds shaped their interpretation (Creswell, 2014:8-9; Savin-Baden & Major, 2013:23; Zuber-Skerrit *et al.* 2015:111). The nurse educators were unique, within their personal ethical behaviour, values and backgrounds. Consequently, these characteristics would form their

perceptions of challenges they considered to be facing in terms of the implementation of HFS.

The **methodology** of this study was a qualitative approach used to answer the questions concerned with why, what, where, when, and the manner in which data was collected and analysed (Scotland, 2012:9).

1.6 Research design

A research design is an overall strategy selected by the researcher that is most appropriate to the research problem and purpose. It has a social value through generation of knowledge that can lead to improvement of existing knowledge (Brink *et al.* 2012:128; Burns & Grove, 2009:22; Creswell, 2014:11; Botma *et al.* 2010:5).

For this research to be able to draft stratagems in order to identify and describe challenges facing nurse educators in the implementation of high fidelity simulation at a public nursing college, a qualitative, descriptive approach was chosen.

1.6.1 Descriptive design

Burns and Grove (2009:696) as well as Brink *et al*. (2012:112) assert that a descriptive design is used to determine a happening of importance, identify variable elements within that happening, draw up theoretical and practical descriptions of these variables and describe them in their normal location.

Furthermore, Botma *et al.* (2010:110) state that a descriptive design is employed when a topic is relatively unknown. It was essential to capture and describe data correctly to understand a phenomenon within a descriptive study. All the steps and procedures within this research were described in detail in Chapter 3. The researcher set out to

capture and describe the anticipated challenges that faced nurse educators in the implementation of high fidelity simulation at a public nursing college.

1.7 Research technique

The **Nominal Group Technique (NGT)** was employed within this study in order to gather data. The NGT has been found to be a popular and effective group process involving problem identification, solution generation and decision-making (Delbecq & Van den Ven, 1971:473,481; Harvey & Holmes, 2012:188; McMillan, King & Tully, 2016:655-662). This research technique was a planned small group discussion with the goal of identifying problems and finding solutions to them (Delbecq & Van den Ven, 1971:466; Harvey & Holmes, 2012:188; Botma *et al*. 2010:251). NGT was selected by the researcher to collect data to explore and describe the challenges that nurse educators perceived to be facing with the implementation of HFS.

The NGT is a comprehensively structured method which requires full adherence to the protocol of the technique. There were five Steps to this technique. The sessions would be started with the Step 1, which was the introduction and explanation. Step 2 was the non-vocal generation of recommendations. Step 3 was the Round Robin reporting of recommendations, to be followed by the group discussion and clarification phase as Step 4. The final phase was Step 5, during the course of which the recommendations were ranked through voting and prioritisation. The group sessions themselves were comprehensively discussed within Chapter 3.

The **advantages** of the Nominal Group Technique were that all participants were actively involved in the NGT (Harvey & Holmes, 2012:188; Islam, 2008:125), but with no direct individual interaction taking place between group members (Delbecq & Van den Ven, 1971:466; McMillan *et al*. 2016:655-662). This research technique thus

simplified the identification and exploration of anticipated challenges facing nurse educators with regard to the implementation of HFS in an orderly and impartial manner. Furthermore, participants could confidently express their opinions in an even-handed and impersonal manner as the recommendations of participants would not be identifiable. Moreover, data validity was enriched as both facilitator and participants were present during generation, control and verification of the data (Allen *et al*. 2004:110). The NGT was time-efficient, since only one session was required per group and a considerable amount of information was gathered in a relatively short time. The NGT was financially viable as the venues were available without charge, the participants were familiar and comfortable with the environment and they did not need to travel to participate in the sessions. A further advantage was that participants did not need to make preparations for the session, which reduced stress and left them relaxed. As the NGT session progressed, the participants became part of the discovering of data and dissemination of results. This produced a sense of achievement at the end of the session. Group members all had equal representation. It was however important for the facilitator to ensure that no participant dominated the group. Participants were all offered the opportunity to state their opinions and empowered to share information that they felt might lead to a more successful implementation of HFS. Harvey and Homes (2012:190) concurred that the advantages of NGT far outweighed the disadvantages.

Few **disadvantages** of the Nominal Group Technique could be resourced in literature. According to Varga-Atkins *et al*. (2015:8)*,* disadvantages of the NGT were that its structure did not allow for a thorough in-depth interview of each participant; and facilitators could not always understand the output in the form of brief note responses from the participants. In order to address this, the researcher decided to take field

notes during the nominal group sessions. Moreover, unless the correct participants had been selected for the NGT from the correct population, the value of the data would have been compromised. **Limitations of NGT:** Lack of anonymity in a face to face NGT may impact on the participants. However the participants in this study seemed to be comfortable to participate; even though they met face-to-face in a group. There were no personal information on the data collected.

1.8 Population and unit of analysis

According to Polit and Beck (2012:738), the concept of population comprises all elements (events, individuals, substances or objects) which meet the sampling criteria within a study. The population concept is described by Brink *et al*. (2012:131) as all the persons who meet required research conditions. The population of this study comprised 65 nurse educators employed at the campuses of a public nursing college in the Free State Province of South Africa. The unit of analysis of this study was all the nurse educators at the campuses of a public nursing college NEI. Included were all the participants who gave voluntary informed consent and had worked at the NEI for over six months and were professionally conversant with English, the official language of the campuses.

1.9 Exploratory interview

According to Polit and Beck (2012:563), an explorative interview is a practice performed in preparation for the larger data collection process. It makes use of a smaller population sample that might be included in the main study if the question were to remain the same (Botma *et al.* 2010:291). Expert researchers were consulted

for the explorative interview, which is discussed in chapter three. The question that was used during the NGT was approved for data collection.

1.10 Data collection

The experienced facilitators made use of the data collection technique in respect of nominal groups. The researcher was present, with the permission of the participants, as an observer during the sessions and took field notes for the facilitator during the nominal group discussions. Smaller classrooms were chosen for the nominal group sessions, as these venues were both familiar and friendlier for the number of participants. The classrooms were located in a quiet, secluded campus areas and possessed adequate illumination with an ensured comfortable temperature. Dates, times and localities for the NGT-sessions had been arranged before the time with the management of the campuses, as well as the facilitators and participants. Two sessions with a total of fifteen participants were carried out by means of the NGT-process. According to Brink *et al*. (2012:34), researchers throughout their research were obliged to adhere to the basic ethical principles. In chapter three the data collection process is explained in more detail. The data analysis process had already been initiated by participants during NGT sessions.

1.11 Data analysis

It was the opinion of Polit and Beck (2012:725) that data analysis was the organised, systematic synthesis of research data to be able to compare, reduce and give meaning to data. Data was analysed by using content analysis, as was fully discussed in chapter three. An experienced co-coder with a master's degree in qualitative research assisted with data analysis. Polit & Beck (2012:745) stated that there should be a high

degree of confidence in the findings of the data. The researcher strove to adhere to this.

1.12 Trustworthiness

Creswell cited by Botma, (2010:230) identified trustworthiness as an important part of a qualitative study. Trustworthiness may be broken down into four epistemological standards, namely truth-value, applicability, consistency and neutrality. The model of Lincoln and Guba (1985), referred to these as credibility, dependability, confirmability and transferability (Brink *et al.* 2012:172) and Polit & Beck (2012:584), added authenticity as a fifth criterion. The researcher made use of all these criteria within the study in order to increase the element of trustworthiness in the research. Trustworthiness was further enhanced during the nominal group discussions by the direct involvement of the participants in the process of data collection and confirmation of its accuracy. Each criterion and the application thereof is discussed in detail within chapter three. The participants in the research were treated with respect and the researcher endeavoured to apply the highest ethical principles throughout.

1.13 Ethical aspects

Ethical aspects are a system of moral values guiding researchers. The basic principles of respect for persons, beneficence and justice must be honoured according to Botma *et al. (*2010:277). Respect for people was manifested in obtaining approval from an ethics committee and permission from institutions where the research took place (Dhai, 2019:60-67). Permission to conduct the research was obtained from the following: UFS School of Nursing Evaluation Committee, UFS Health Sciences Research Ethics Committee (Appendix 1), Free State Provincial Health Research

Committee (Appendix 3), acting principal of the public nursing school and deans of each campus (Appendix 4).

Ethical aspects needed to be enforced through procedures when individuals were used in research, as their rights must be protected (Polit & Beck, 2012:150). Therefore, the researcher considered issues regarding respect for persons, justice, and beneficence throughout the study. The researcher explained both the purpose and the extent of the study to the participants. Voluntary informed written consent was obtained from the participants. All other ethical aspects are elaborated on in chapter three.

1.14 Layout of chapters

Chapter one presents a brief overview of the study. In chapter two the background and literature review are discussed to promote a better understanding of the study context. Chapter three comprises a description of the qualitative research methodology. Chapter four contains a record of the data analysis and their results. Findings and recommendations are concluded in chapter five.

1.15 Conclusion

In summary, in this chapter, the researcher gave a brief description of the background and the importance of executing the research study. The research method, technique and other important elements were briefly explained and will be elaborated on in chapter three. Chapter two which follows will afford the reader further information and background into the need for the study.

CHAPTER 2: LITERATURE REVIEW

"Research is to see what everybody else has seen, and to think what nobody else has thought".

Werner von Braun

2.1 Introduction

A concise overview of this research study was discussed in the previous chapter. Reasons for, and the importance of, identifying the challenges nurse educators perceive to be facing with regard to the implementation of HFS in a public nursing college in South Africa, will be discussed in this chapter. Health care educators in South Africa perceived the need to explore the importance of implementing HFS in the new undergraduate nursing curriculum. Internationally, the number of simulation facilities across the world is growing rapidly (Seropian & Laverly, 2010:338). SANC and CHE have set into motion the transformation of nurses' training with the objective of bringing nursing education progressively within the parameters of this relatively new pedagogical trend.

2.2 Background of developments in South African nursing education

An Anglican Sister, Henrietta Stockdale, started the first formal nursing training course in South Africa, on the Kimberley diamond mines in 1877 (Horwitz, 2010:2). According to Searle (cited by Ehlers, 2002:207) South Africa became the world's first country to grant state registration to professional nurses in 1891, when the Medical and Pharmacy Act 34 of 1891 made provision for the registration of, among others, nurses and midwives. The South African Nursing Council (SANC) came into being in 1944, through Act 45 of 1944 (Ehlers, 2002:207; Horwitz, 2010:3), and has remained

responsible for the maintenance of standards for all nursing courses offered in South Africa leading to registrations with the SANC (Ehlers, 2002:207).

Training took place within hospital-based colleges, allowing nurse educators to integrate theoretical with practical learning (Searle, 1965:244). Nurse training was also offered at universities, with the introduction of the first nursing diploma by the University of the Witwatersrand in 1937. The University of Pretoria offered the first basic nurse training at a university level with a B.A. in Nursing in 1955 (Horwitz, 2010:1,4). In 1980, the De Lange Commission of Enquiry recommended that colleges be placed in post-secondary education institutions (Searle, 1988:155). This resulted in formal affiliation agreements between nursing colleges and university nursing schools in order to monitor academic standards (Mashaba, 1995:129). All nursing education and training responsibilities in terms of the Nursing Act 50 of 1978, as amended, were allocated to the South African Nursing Council (SANC) (Searle, 1988:149).

This situation changed again in 1995, in response to the rise of democracy and a new dispensation for South Africa, which included a call for unification and a single co-ordinated higher education system for South Africa. In terms of The Higher Education Act 101 of 1997, all higher education institutions, (including those offering nursing) were placed under the National Department of Education.

2.2.1 South African Qualifications Authority

The South African Qualifications Authority Act 58 of 1995 categorised all qualifications in South Africa – including those of nursing – into basic, further and higher education; a uniform structure known as the South African National Qualification Authority, or SAQA (Direko & Davhana-Maselesele, 2017:2). SAQA is responsible for the

development of the National Qualifications Framework (NQF) used in South Africa to determine levels of qualifications today – see Table 2.1 for post-matric (national certificate) qualifications levels.

Table 2.1 SAQA National Qualifications Framework NQF levels (adapted from www.saqa.org.za).

SANC was compelled to adapt its nursing education framework in order to accommodate these new developments and the higher education qualification system.

2.2.2 South African Nursing Council

As was the case with other South African statutory bodies, the South African Nursing Council (SANC) became a subject of transformation within the democratic dispensation of South Africa. The National Health Act 61 of 2003 and Nursing Act 33 of 2005 led to the inauguration of the new SANC in 2013. SANC was accredited by

SAQA as an Education and Training Quality Assurance Body (ETQA) for nursing qualifications. This permitted SANC to establish and control standards and quality of nursing education, provide the scopes of practice of the different categories of nurses, afford directives and regulations for new nursing education training programmes and qualifications, endorse new curricula and manage accreditation of NEIs.

2.2.3 Governing bodies accountable for nursing education in South Africa

The responsibility of nursing colleges and nursing education, which formerly resided under the sole legislative responsibility of SANC, was in the process of being restructured and moved to higher education where it would resort under shared responsibility and partnerships between SANC, Council of Higher Education (CHE) and National Department of Health (NDoH), implying forthcoming changes in qualifications and the need for new undergraduate nursing curricula (Blaauw *et al*. 2014:2, Direko & Davhana-Maselesele, 2017:1). These curricula, designed by the collaboration of various role-players, were scheduled for release and implementation during 2020. Role-players involved included SANC, the Human Resources Division of the National Department of Health (NDoH), South African Qualifications Authority (SAQA) and the Council on Higher Education (CHE). Input was likewise received from Nursing Education Institutions (NEIs) nurse educators, nursing organisations and health sector unions (Blaauw *et al*. 2014:6). The provincial departments of health were tasked to develop an integrated plan for provisioning of nurse education based on, among other, new technology, evidence of skills shortages and requirements, cost containment, and quality improvement (National Department of Health, 2019:15).

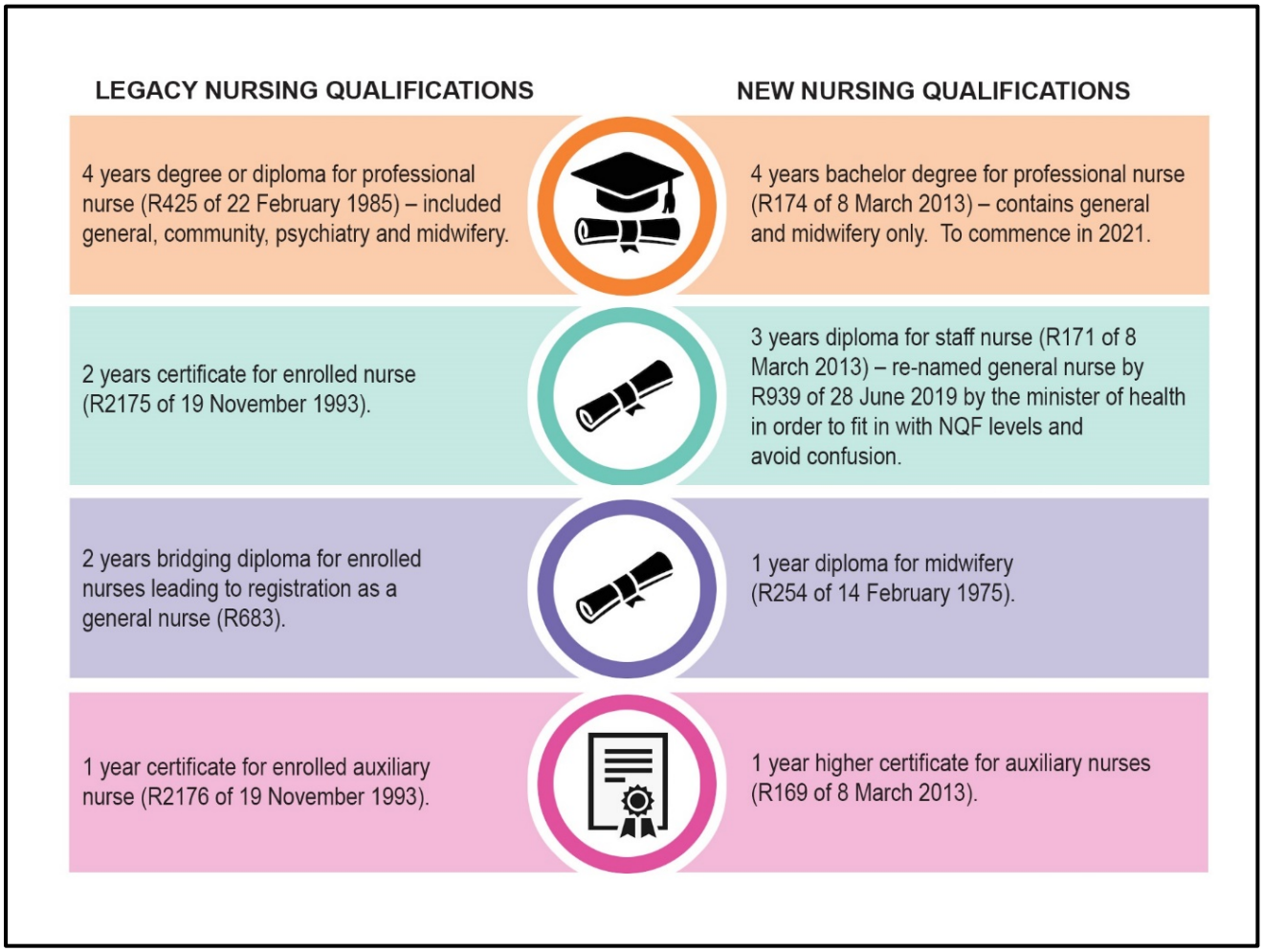
2.2.4 Nursing education institution

The Strategic Plan for Nursing Education, Training and Practice, was released in 2013 as part of the process of transformation of nursing education, thereby regulating the new nursing qualifications and replacing the previous nursing qualifications (referred to as legacy nursing qualifications). Table 2.2 displays a comparison of the previous nursing qualifications with the new nursing qualifications.

The final intake for the R425 programme took place in 2019. It was anticipated that the programme would continue to run concurrently with, yet separately from, the new R171 undergraduate nursing curriculum for the next four to six academic years, including two years teach-out period, after which it would naturally be phased out in 2024 (SANC, 2020:online).

The new undergraduate nursing curriculum for registration as a Professional Nurse and Midwife (Regulation No. 174 of 08 March 2013 introduced in 2020 by the SANC quoted from the Nursing Act 33 of 2005) states that “Clinical learning must take place in a range of clinical settings and other learning sites that will facilitate the achievement of the programme outcomes” and that “a minimum of 60% of formative clinical assessment activities must be done in real life situations” (SANC 2013:6,7). Therefore 40% of other activities, such as HFS, might be utilised. In their new undergraduate nursing curriculum, the NEI employed for this study has indicated that 20% of clinical learning hours, eight hours a week, would be spent in simulation as part of students’ work-integrated learning (WIL).

Table 2.2 Legacy nursing qualifications compared to the new nursing qualifications (adapted from sanc.co.za).



2.3 The implementation of HFS in the new nursing curricula

The implementation of HFS in the new undergraduate nursing curriculum, and as a new nursing education strategy proposed to lead to an increase in practice opportunities on manikins in realistic clinical scenarios which are vital for students nursing experiences, yet difficult to find within the clinical area. The students' learning experiences and cognitive judgemental skills might be improved, leading to more confident and capable nurses and optimal patient care (Guise, Chambers & Välimäki, 2012:412; Nel & Stellenberg, 2015:176). The use of HFS would not only assist nurse

educators to expose more students to scenarios pivotal to their training but would likewise ensure that it be done in a realistic yet safe, controlled environment, without the potential of harm to patients while learning took place.

In South Africa, there has been an increase in the incidence of medical (including the nursing community) negligence litigation claims against the Department of Health, resulting in considerable financial settlements. (Maphumulo & Bhengu, 2019:2). Some of these settlements might possibly have been avoided if nurses involved had been given more realistic exposure to clinical scenarios by means of HFS training. In recent reviews in respect of the use of clinical simulation to improve quality and safety in health care, Escudero *et al*. (2019:13) discovered that using simulation in the study of health care improvement was a promising approach that could usefully complement established research methods. Experience gained in practicing procedures on manikins during HFS sessions before carrying them out on patients was expected to improved quality and safety of patient care.

Moving nursing to higher education would serve to encourage nurse educators in South Africa to ensure that their learning and teaching methods, while remaining in a South African context, were in line with international nursing trends that increasingly feature HFS. One such trend encompassed the growth and development of simulation as a teaching- and learning strategy (King, 2018:235). In terms of changes and the new undergraduate nursing curriculum, nurse educators were challenged to assess current teaching methods in order to ensure that these methods remained relevant with regard to changing trends within nursing education. NEIs needed to support nurse educators by generating a favourable environment in which to execute and accomplish this innovative strategy within the new nursing qualifications curricula. The campuses of the public nursing education institution (NEI) researched in terms of this study, had

limited access to HFS and required its formal and effective implementation in the public NEI.

2.4 HFS: A learning and teaching strategy

Simulation constitutes a kind of play which imitates operations of real-world processes or systems, and may be divided into low, medium and high fidelity simulation. It is a teaching strategy that uses “one or more typologies to promote, improve or validate a participant’s progression from novice to expert” (Meakim *et al.* 2013:53).

Simulation in various forms is used for a variety of reasons; it is used in health professions education, in part for teaching, learning, and assessment. Globally, research outcomes confirm the successful use of simulation as a learning strategy in nursing education (Weaver, 2010:37; Bambini *et al.* 2009:80; Welman & Spies, 2016:2; Kim *et al*. 2016:7). The early use of simulation was limited to low- and medium fidelity simulation, but significant technological advances in the past two decades have advanced the use from medium to high fidelity simulation (Guise *et al*. 2012:412; Oh *et al*. 2015:e6).

Low fidelity simulation, the use of anatomical models by students to practise the administration of injections and other competencies (Lavoie & Clarke, 2017:18), and medium fidelity simulation and the use of manikins simulating basic heart, breathing and bowel sounds without the realistic environment of high fidelity manikins (Ntlokonkulu *et al.* 2018:2) have long been used as an effective teaching strategy by NEIs, including the NEI chosen for this study.

High fidelity simulation (HFS) is the distinct use of computerised manikins, virtual simulation or standardised patients in life-like realistic and safe nursing simulated

scenarios (D'Souza *et al*. 2017:340; Duphily, 2014:127). Health care systems worldwide require registered nurses to have sufficient knowledge, skills and attitudes to ensure safe practice. Simulation training in nursing education may be used as an effective teaching strategy for students to evaluate their own actions during simulation, reflect on abilities and evaluate the clinical decisions of others (King, 2018:236) in order to improve technical, communication and team working skills. High fidelity simulation is a powerful training tool within the field of health care. Research reveals that the use of simulation in nursing education is gaining in validity and reliability as a teaching model to provide nursing students with the experiences required for skills development (Connelley, 2016:14, Fero *et al.* 2010:2184).

The American National Council of State Boards of Nursing National Simulation Study assessed incoming nursing students from ten pre-licensure (pre-accreditation) programmes across the United States of America by means of randomisation into one of three study groups: a control group, a 25% group with students who had 25% of their traditional clinical hours replaced by simulation, and a 50% group who had 50% of their traditional clinical hours replaced by simulation. The results of this study provided substantial evidence that substitution of high-quality simulation experiences for up to half of traditional clinical hours produced comparable end-of-programme educational outcomes and new graduates who were ready to enter clinical practice: thus, a favourable result (Hayden *et al.* 2014: abstract). An example of this might be observed in midwifery students who gained confidence and acquired skill and experience from practising simulated normal vertex or complicated deliveries on HFS manikins specifically designed to simulate childbirth (Cooper *et al*. 2011:12). These skills could be experienced and practised in the safety of the HF simulation laboratory, with the guidance of skilled nurse educators.

The Nursing and Midwifery Council of the United Kingdom lifted its 300- hours limit that students may spend in simulated practice, (Nursing & Midwifery Council: 2018:25) stating that their "new approach is to be less prescriptive and more outcome-focused, allowing autonomy to enhance and develop forms and uses of simulation for learning and assessment that facilitate safe and effective care" (Dawson, 2018:online). There appears to be a gradual trend for international nursing education statutory bodies to turn to simulation, including HFS with its many advantages, in order to afford students much-needed opportunities to practise and develop critical nursing skills in a safe and positively controlled environment. Nurse educators today need to be increasingly innovative. They need to empower themselves by becoming skilled in new, ground-breaking nurse education strategies in order to prepare their students for the professional challenges they may face in future. HFS is one such strategy which is currently receiving much attention, encouraging educators to think innovatively in order to incorporate simulation into their programmes.

2.4.1 Advantages of high fidelity simulation

The justification for using simulation in nursing education is the enhancement of students' knowledge, skills and attitudes in a safe learning environment, prior to their interaction with patients. Students benefit through development of confidence and experience satisfaction by means of this mode of learning strategy (Jeffries, 2005:102). Nurse educators likewise benefit: they can teach, assess and ensure that the students are optimally equipped for clinical settings. Moreover, nurse educators could become increasingly autonomous, creative and experts in their speciality fields through the exercise of educational skills within high-fidelity simulation. Simulation is therefore also aimed at transferring learning to the clinical setting, ensuring patient safety and improved outcomes (Janse van Vuuren *et al.* 2018:3) and developing

clinical judgement, communication skills and group collaboration, as well as legal-ethical perspectives and aesthetic values (Issenberg *et al.* 2011:155-163; Moule, 2011:645; Gamble *et al.* 2016:1).

Simulation plays an important role in critical thinking and the mastering of skills in a number of different sectors such as aviation, the military and medicine (Hallenbeck, 2012:260). It is aimed at reducing the risk and cost of human error, as well as at training novice practitioners in problem-solving skills and crisis management, particularly when new and possibly hazardous procedures and equipment are introduced (Botma *et al.* 2014:75). In nursing institutions in South Africa, simulation affords nursing students the opportunity to develop and practise their skills in a realistic, safe and controlled environment on manikins (Welman & Spies, 2016:2), before entering the workplace and nursing real patients.

Simulation is a successful learning strategy which is evolving rapidly across the health care spectrum in the preparation of health care professionals and specialist nurses in actual clinical situations. The success of the various types of simulation is attributed by the literature to learning by doing and reflective practices incorporated into the learning strategy.

Other advantages of HFS include opportunities for the nurse educators to integrate simulation into the curriculum, flexibility to use an assortment of learning strategies, instantaneous feedback may be given, the level of skill needed for the scenario may be adjusted accordingly during simulation and learning experience can be adapted to suit the specific needs of the student (Kim *et al.* 2016:2). Garret *et al*. (2010:309) found that students being taught by simulation absorbed skills more speedily than those being taught through traditional education practises, while Kneebone (cited by

Welman & Spies, 2016:2) asserts that stimulation produces ideal teachable moments by placing students' needs at the centre of attention.

2.4.2 Disadvantages of high fidelity simulation

Literature provides but few examples of disadvantages of HFS (Larue *et al.* 2015:134 check spelling). Some students experience simulation as being stressful and as an impediment to learning (Leigh 2008:6; Valler-Jones *et al.* 2011:630). However, Khadivzdh and Erfanian (2012) posit that students' perception of simulated experiences were more positive than the traditional learning style because simulation led to lower anxiety in real clinical practices.

Simulation demands large amounts of time, effort and resources on the part of the staff to acquire simulation skills and introduce these into the curriculum (Abrahamson *et al.* 2006). Nurse educators find it difficult to design a tool for assessing students' efforts in respect of simulation practises (Morgan *et al.* 2007). These disadvantages, however, might be turned into advantages. Once the initial time, effort and resources have been put to good use, and staff have acquired simulation skills and scenarios, and tools for assessing students' efforts have been designed, it may become possible for HFS sessions to be implemented and for these to run smoothly and effectively on a year on year basis.

Simulation is a costly process, both in respect of material and human resources. Acquiring and maintaining manikins, developing, running and revising scenarios, producing and preparing places for simulation to take place and teaching smaller groups of students at a time is financially expensive (Larue *et al.* 2015:134). Challenges to implement HFS globally, nationally and locally are the same everywhere but in varying degrees. For example, countries with more financial and other resources

will find it easier to implement HFS than poorer countries with less resources available to them. NEIs should have prepared their nurse educators for the implementation of the new undergraduate nursing curriculum, including HFS, timeously. Nurse educators, a costly human resource, play a large role in HFS.

2.4.3 Nurse educators' role in high fidelity simulation

Nurse educators play an essential role in directing and assisting students to gain knowledge, acquire competency skills, demonstrate affective attitudes and master psychomotor skills for a safe professional practice. They also play an important part in improving the image of nursing (Baghoomian, 2014:51, 49). As the number of nursing schools grew, there was an increased need for new models of education associated with concerns about patient safety, the shortage of nurse educators, and preparing students for an increasingly high-technologically complex work environment (King, 2018:236). The existing shortage of nurse educators resulted in an increased lecture-student ratio in the clinical setting.

Nurse educators constantly seek more realistic environments in which to train their students. Unfortunately not all clinical areas are conducive to such training. Finding opportunities for students to learn critical skills while considering patients' safety is a challenge. Students are not guaranteed of exposure to learning opportunities of "low-incidence but highly critical events" in the clinical setting (Janse van Vuuren *et al.* 2018:2). Nurse educators, therefore, need to expose themselves to new learning and teaching strategies.

The primary obligation of nurse educators is to facilitate student learning by creating a learning environment in classrooms and clinical skills laboratories that enable students to accomplish desirable outcomes (Baghoomian, 2014:51). HFS is an

effective learning and teaching method aimed at achieving these outcomes, with debriefing playing a vital role.

Debriefing after HFS sessions is an effective way of interactive communication between nurse educators and their students to aid the latter in identifying and understanding their thinking patterns in order to correct these where necessary. Feedback should be provided by nurse educators in a safe debriefing environment, correcting mistakes in a respectful manner and allowing students to share their experiences (Kolbe *et al.* 2015:89,90; Kable *et al.* 2013:237; Welman & Spies, 2016:1). A confidentiality agreement should be reached between nurse educators and students to maintain confidentiality about simulation and debriefing proceedings, as this increases the psychological safety felt by students (Welman & Spies, 2016:1).

Training institutions are required to address the quality of teaching and learning as well as the delivery of quality education on a continuous basis by means of exploration of new strategies and techniques of promoting in-depth learning (Biggs & Tang, 2011:3; Potgieter, 2012:4). As opposed to traditional teaching methods, simulation maximises learning since this method provides a realistic, controlled learning environment while minimising the risk of harm to the patient (Rodriguez *et al.* 2017:30). Current evidence suggests that key learning outcomes such as self-confidence, critical thinking abilities and mastery of clinical skills - associated with competent clinical nursing practice – are obtained when HFS is woven throughout the curriculum (Rodriguez *et al.* 2017:31). Integrating HFS would challenge nurse educators to think imaginatively about how to introduce HFS into their subject matter in a resourceful and creative way that would encourage active learning.

The success of simulation might depend on factors such as the ability of nurse educators to transform educational perceptions from a teaching perspective to an active learning view, developing new technological skills, administrative and logistical support, adoption of the simulation and some factors might be unknown (Dyson, 2018:98). The relevant literature indicated a number of barriers facing nurse educators in the effective implementation of simulation. Lack of support, time, resources, and motivation, as well as fear of using HFS simulation based on lack of training and previous negative experiences of nurse educators contributed to resistance and under-utilisation of HFS (Munangatire & Naidoo, 2017:45). In order for HFS as a complex learning strategy to be employed successfully, planning of a very high standard and co-operation between all the role-players is of paramount importance (Issenberg *et al.* 2005:27). Nurse educators may become frustrated and disappointed if HFS was not properly implemented, resulting in its benefits' being severely compromised (Munangatire & Naidoo, 2017:47). A state of readiness for the implementation of HFS was an important factor to ensure initial success. Planning to initiate simulation as a learning strategy entailed the identification of obstacles that might obstruct the way forward.

Little was known of the challenges facing the nurse educators in implementing HFS since these challenges, by and large, had not yet been explored. Unless these educational challenges were to be identified and investigated, such an omission might contribute to the unsuccessful implementation or even to the non-implementation, of HFS. The aim of this study was the investigation of the anticipated challenges faced by nurse educators with regard to the implementation of HFS into the new curricula at the campuses of a public nursing college of the Free State Province: this province is situated in the geographical centre of South Africa. Nurse educators are challenged to

stay abreast of the newest trends for training nurses for the future. In the light of this, and as mentioned previously, the intention of this research was to gain insight into anticipated challenges faced by nurse educators in implementing high fidelity simulation (HFS) at a public nursing college, in which the nurse educators themselves are employed.

Although research exists to support the concept of student learning through simulation, there remains a want in the available literature in respect of the successful process of implementing HFS in NEIs in South Africa. Institutions and nurse educators had reported that they faced challenges and barriers as far as the implementation of simulation as a teaching method was concerned (Nehring *et al.* 2013:1,5,13). Barriers might negatively affect or hamper nurse educators' perceptions regarding the successes of HFS implementation (Berragan, 2011:662-663). Doubts about the efficacy of simulation might result from barriers experienced during the implementation of HFS.

2.4.4 National evidence of HFS

In South African nursing education, HFS was a relatively new approach, with little local literature available on the simulation method used by nurse educators in their instruction. The dearth in available literature on the use of simulation in South African NEIs suggested that NEIs and nurse educators were not utilising simulators as effectively as they should be (Thurling, 2017:31). Nurse educators were aware of the advantages of simulation-based training, yet some lacked the motivation to learn how to use the technology or felt uncomfortable with it, and the aging population of nurse educators caused anxiety and frustration (Janse van Vuuren *et al.* 2018:1). A national survey of nurse educators and clinical training specialists carried out at a private nursing college in South Africa to determine the perceptions of nurse educators

regarding the use of HFS at their college revealed that while the participants were at the same level as far as technological readiness was concerned, this did not play an important role in the use of HFS. Instead, it was found that training was needed to prepare them adequately for the use simulation equipment and further research to determine what other factors play a role in the use of HFS. (Janse van Vuuren *et al.* 2018:1).

The latest South African nursing curriculum would oblige nurse educators to re-evaluate their attitudes towards simulation. As far as the researcher was able to ascertain, the UFS was the only South African university currently offering a short learning course for nurse educators on high fidelity simulation training, although institutions such as the Nelson Mandela University in Port Elizabeth had implemented HFS as part of their nursing training. University of the Free State (UFS) School of Nursing inaugurated an advanced nursing education facility (the NEF) in 2009, with the first undergraduate HFS educational experiences introduced in February 2011(Spies, 2016:3). UFS also presented a short learning programme, 'Simulation for Health Professions Educators', geared at preparing health educators tasked with the introduction of HFS at their own institutions across South Africa.

2.5 Current situation in NEI utilised for this study regarding HFS

In 2017, one of the campuses included in this study received a grant from Internet Content Adaption Protocol (ICAP) as part of the Nursing Education Partnership Initiative (NEPI) project. This grant included a HFS laboratory, complete with five HFS manikins, necessary technology, furniture and other required equipment. The campus concerned therefore had a crucial obligation to the nursing students in order to ensure that this implementation was successfully carried out, and to the donors to ensure the

successful implementation and running of this laboratory. Moreover, the campus had a responsibility towards its employer, the Department of Health, as well as towards the South African Nursing Council.

Although two of the three campuses included in this study were not grant recipients, each had a midwifery high fidelity manikin for use in assisting students with simulation learning and training. HFS in one form or another was therefore accessible at all three campuses, which thus enabled inclusion of all nurse educators in the study.

At the time of this study, seven of the 35 nurse educators who took part in this study had attended the formal short learning programme course presented by the University of the Free State for HFS Educators, three from Campus A and two each from campuses B and C. One of them was the researcher of this study who for ethical reasons could not become involved as a participant in the data provision. Of the remaining six nurse educators one afforded informed consent and participated in the study. The NEI intended eventually to send all nurse educators from the three campuses to attend the course. All three campuses did, however, receive training from the manufacturers on the manner in which to operate the manikins.

2.6 Conclusion

In this chapter, the history was given of South African nursing education and its governing bodies from its beginning until the implementation of the new undergraduate nursing curriculum. The implementation of HFS in this new curriculum focusing on its advantages and disadvantages were described. The nurse educators play an important role with respect to the successful implementation of HFS, and as such their challenges regarding the implementation of HFS were investigated. The qualitative research methodology lent itself ideally to this study. In chapter three the researcher will explain the execution of the methodology.

CHAPTER 3: RESEARCH METHODOLOGY

"Qualitative research is very important in educational research as it addresses the "how" and "why" research questions and enables deeper understanding of experiences, phenomena, and context. Qualitative research allows you to ask questions that cannot be easily put into numbers to understand human experience".

Jennifer Anne Cleland

3.1 Introduction

In the previous chapter, the researcher discussed why High Fidelity Simulation (HFS) is playing an increasingly important role in clinical areas across all occupational fields in terms of which students perform practical procedures, with particular reference to nursing education. The importance of researching challenges facing nurse lecturers in the implementation of HFS was also addressed. This chapter will describe the applicable research methodology in detail.

Research is defined by Burns and Grove (2009:2) as exploring something over again. It is concerned with gaining new knowledge by employing a variety of structured techniques and practises in such a way that the new knowledge discovered can be confirmed as the truth (Botma *et al.* 2010:34; Brink *et al.* 2012:2). Research is also a scientific process which is described in every detail by the researcher (De Vos *et al.* 2011:316), so that other researchers may repeat the research in a similar setting in order to compare the results (Brink *et al.* 2012:2; Polit & Beck, 2012:741).

As stated in chapter one, in this research study a qualitative research methodology was followed. This methodology enabled the researcher to observe social life in its natural setting to understand the attitudes and behaviours of participants (Babbie, 2016:289). Smith (cited by Austin & Sutton, 2014:436) described methodology as the

“explanation of the approach, methods and procedures with some justification for their selection”. The researcher using a qualitative paradigm is concerned with understanding naturalistic observation rather than explanation (De Vos *et al.* 2011:308).

3.2 Research paradigm

A research paradigm is an all-inclusive structure of interconnected action and reflection that explains how researchers are going about their research along four magnitudes: ontology, epistemology axiology and methodology (Botma *et al.* 2010:287; Terreblanche *et al.* 2006:6; Killam, 2013:6).

Ontological assumptions concerns are with the constituent parts of reality; in other words, about ‘what is’: it deals with the assumptions about the nature of reality. Reality cannot be directly measured, it occurs as perceived by people and by the spectator (Cleland, 2017:62). Researchers need to take a look at their perceptions on how things really are and how things really work (Scotland, 2012:9). The researcher’s ontology derives from what he believes the research question will honestly address (De Vos *et al.* 2011:309).

The ontological view of this study derived from the nurse educators of the NEI themselves, giving their own honest opinions as to what anticipated challenges were facing them as they prepared to implement HFS in their various campuses.

Epistemological assumptions are with the knowledge that will be created, acquired and communicated by people as they interconnect with the world as they understand it, in other words, what it means to know (Austin & Sutton, 2014:436; Scotland, 2012:9), assumptions about the nature of knowledge (Cleland, 2017:61). The

epistemological approach of this study was in agreement with the theory that knowledge and different opinions would be acquired by means of communication between the participants and the facilitator. The researcher believed that reality should be identified by constructionism, i.e. reality is socially and personally constructed, and the participants of the research must be actively involved in identifying their reality (De Vos *et al.* 2011:310). Epistemology also concentrates on the layout of one's knowledge rather than what it contains (Botma *et al.* 2010:40). Such interaction between the researcher and participants would be a vital factor within the creation of multiple meanings.

Each participant had his or her own particular views on the challenges facing nurse educators regarding the implementation of HFS, and these inputs generate knowledge. Identifying, sharing and analysing these views enable the researcher to identify challenges, potentially highlighting and addressing them, and ultimately assisting in the smooth implementation of HFS at their campuses. It was anticipated that this study might also be of assistance to other NEIs implementing HFS.

Axiological assumptions are concerned with the nature of ethical behaviour (Killam, 2013:6) and values that the research is based upon (Zuber-Skerrit *et al.* 2015:111). The researcher adhered to the highest possible ethical standards throughout the study, respecting all participants, obtaining informed consent and ensuring beneficence and justice. Values were clearly specified, a good relationship with the participants was built on by the facilitator, participants were made aware of the diversity between their different understandings of meanings and the researcher presented a fair picture of the participants' views, continuing to be aware of the advantaged position of the researcher in relation to that of the different participants

(Mertens, 2010:17-18) The researcher remained fully aware that the various participants' backgrounds shaped their interpretation.

Methodological assumptions concerns are with why, what, where, when, and how data will be collected and analysed (Scotland, 2012:9). The researcher followed a qualitative approach, using the nominal group technique whereby the participants gave their inputs regarding the anticipated challenges facing nurse educators in the implementation of HFS.

Social constructivism is a worldview characteristic of qualitative research, whereby social constructivists believe that individuals seek understanding of the world in which they live and work, constructing subjective meanings of their experiences (Creswell, 2014:8; Cleland, 2017:62; De Vos, *et al.* 2011:358). Social constructivism acknowledges the social context, thereby embracing multiple realities, making "uncertainty" a key principle of this paradigm (Henning & Smit, 2004:20).

Participants provided their personal opinions on the anticipated challenges they were faced with on implementing HFS. By verbalising their thoughts, experiences and ideas they were able to identify and give insight into the challenges they perceived with the implementation of HFS, giving the researcher as well as one another a better understanding of the variety and nature of these challenges. The researcher therefore concluded that a qualitative research design would be appropriate for this research topic.

3.3 Research design

Research designs are broadly divided into three categories: qualitative, quantitative

(Brink *et al.* 2012:11; Burns & Grove, 2009:22), and mixed methods research designs (Creswell, 2014:11; Botma *et al.* 2010:255). Quantitative research is a method used to examine neutral models by studying the association among variables, while qualitative research is used for investigating and recognising the sense groups or individuals make of a human or communal problem (Creswell, 2014:4). Mixed methods design contains aspects of both approaches (Creswell, 2014:3).

This research study adopted a qualitative research design, exploratory approach and descriptive in nature, using social constructivism as its guiding paradigm, a view relevant in the context of this study. As stated earlier, the purpose of the study required a naturalistic inquiry that supports the philosophical stance of constructivism (Cleland, 2017:62; Creswell, 2014:5). The researcher selected a qualitative approach to capture the richness and complexity of the participants' responses describing the challenges that they as nurse educators perceived to be facing in the implementation of HFS.

3.3.1 Qualitative design

Qualitative research is a methodical, collaborative, interactive, subjective approach to investigate and describe life experiences in an in-depth and holistic manner and make sense of these (Burns & Grove, 2009:22; Polit & Beck, 2012:739). It is concerned with "how the social world is interpreted, understood, experienced, or constructed" (Cleland, 2017:62). This design can be used if little is known about an occurrence and the researcher would like to investigate, describe and achieve an understanding of personal experiences which would be difficult to otherwise quantify (Babbie, 2016:90; Brink *et al.* 2006:120). The qualitative design entails the collection of information of people's experiences and perceptions regarding a specific situation in a systematic, interactive and subjective way in order to gain insight into that situation (Brink *et al.* 2012:113; Creswell, 2014:185-186). Qualitative research is concerned with

individuals' personal experiences of a life event, its aim to understand what they have said in order to convey why they have said it (Austin & Sutton, 2014:438). Different people have different views of the same thing, depending on their upbringing and other experiences, professional background and training (Cleland, 2017:62). In this study the participants experiences and perceptions of challenges they may be facing in the implementation of HFS is vital for the researcher, and were collected in a systematic, interactive and subjective manner by means of the nominal group technique.

As an emergent design, qualitative research reveals the path to be followed as the researcher makes continuous decisions on design based on information as it is acquired in the progress of the research. Therefore, the researcher took into account context, and interaction with participants elicited the categories of meaning, personal experiences, and needs, thereby avoiding the personal conclusions of the researcher. (Creswell, 2014:186,205-206; Polit & Beck, 2012:717). Qualitative research with the appropriate research technique has the capacity to evoke the necessary responses from the participants.

3.3.1.1 Advantages of qualitative design

The advantages of qualitative research design within this particular ambit are manifold: firstly, qualitative research design is based upon human experiences and observations. Secondly, this form of design enables subject materials to be evaluated in detail. Thirdly, the gathered data has a predictive quality to it (Sutton & Austin, 2015:226-229). These three factors were invaluable in assisting an emergent qualitative research design to come to fruition in full and balanced format within this study. Creswell (2014:185) concurs by elaborating on the basic characteristics of qualitative research needed for a study. They include, natural setting, researcher as key instrument, multiple sources of data, inductive and deductive data analysis,

participants' meanings, emergent design, reflexivity and holistic account. The researcher developed a complex depiction of challenges the participants perceived to be experiencing. They shared their own personal experiences regarding challenges perceived to be facing them with the implementation of HFS. The documentation written down by each participant and the field notes made by the researcher during the discussions were comprehensively evaluated in minute detail during analysis of the data. The high specialisation and expertise of the participants taking part in the study meant that their inputs and therefore the findings of the study had a predictive quality, probably representing challenges similar to those that would face other nurse educators implementing HFS at other NEIs.

Another advantage of the qualitative research design approach is that this method creates wider understanding of behaviour and assists with problem-solving (Daniel, 2016:92). Qualitative design attempts to facilitate wider understanding of the challenges faced by these nurse educators who are human beings with varying individual affecting factors. Their individual perspectives enable nurse educators to offer unique and varying standpoints regarding a specific issue. The different perceptions of each person taken individually casts a specific light upon an issue.

Qualitative research design by the researcher with the assistance of a co-coder may be found to take a lengthier period of time in comparison to quantitative research design. This, however, may prove advantageous as in-depth data analysis carried out by the researcher enhances the quality and credibility of the study. Systematic, in-depth fieldwork that yields high quality data together with methodical and conscientious analysis of data with attention to issues of credibility are two elements upon which the credibility of qualitative inquiry depend (Patton, 2015:654).

3.3.1.2 Disadvantages of qualitative design

One disadvantage of the qualitative design is that rigour is more problematic to sustain, assess and demonstrate (Anderson, 2010:1). This constraint can be overcome by means of rigorous examination of data by the researcher with regard to reliability (Anderson, 2010:5) and validity of the qualitative research design in order to assess both objectivity and credibility of the research. According to Anderson (2010:1) the terms reliability and validity that have traditionally been related to quantitative research are being progressively considered as important concepts in qualitative research too. Validity relates to the honesty and authenticity of research data and, reliability relates to both stability and reproducibility of data (Anderson, 2010:2). Polit & Beck (2012: 582-583) stated that validity and reliability are more applicable to quantitative design and Creswell (2014:206) asserted that the qualitative researcher "seeks believability based on coherence, insight and instrumental utility and trustworthiness".

According to literature, a further disadvantage of qualitative design is that data interpretation and analysis may be more difficult and complex (Rahman, 2017:105). The experience of the researcher found this to be true, in that the process of both data gathering and the analysis thereof, proved to be a time-consuming and intensive process. The qualitative form of research design had thus proved to be a more laborious and complex process than that employed by quantitative research design.

Quantitative research design may prove swifter to process due to the fact that statisticians assist with data analysis thus shortening the time needed for data analysis. The researcher, however, found qualitative design to be more advantageous than quantitative research for this specific study. Employing a qualitative research approach, the researcher was able to explore and describe the nurse educator's

anticipated challenges regarding the development of a constructivist approach to teaching HFS. A quantitative approach would not have been appropriate for this research study, because a qualitative research design is subjective, broad, characterised by words and an individuals' understanding and experience of the unique situation in which they find themselves (Burns & Grove, 2009:23; Creswell, 2014:186; Polit & Beck, 2012:532-534).

A qualitative design helped the participants to explore their experience, as the data collection quorum allowed participants to reflect upon their own active construction of knowledge and the reality which was determined by the experience of the participants.

3.3.2 Descriptive design

A descriptive design is employed when a topic is relatively unknown (Botma *et al.* 2010:110). Schmidt and Brown (2012:176) also Polit and Beck (2012:226) indicate that descriptive design provides a clear picture of the situation as it occurs naturally. The researcher observed and then described what was observed by means of field notes during NGT groups. Babbie (2016:91) noted that "many qualitative studies aim primarily at description". A descriptive design is used to determine a happening of importance, identify variable elements within that happening, draw up theoretical and practical descriptions of these variables, and describe them in their normal location (Burns & Grove, 2009:696; Brink *et al.* 2012:112). Botma *et al.* (2010:110) stated that advantages of this design are that it can be carried out in a reasonably short amount of time and is reasonably economical. Disadvantages are that the level of information attained is sometimes found to be shallow, this design cannot be used to examine a relationship between variables (Botma *et al.* 2010:110).

The research design of this study was descriptive in nature and lent itself ideally to this study as it set out to define the anticipated challenges faced by nursing educators with

the implementation of HFS. The researcher explored the option of different approaches in order to choose the optimum research technique. A descriptive design was held by the researcher to be the most appropriate choice. Pursuant to this consideration was the fact that not much was known at present regarding the perceived issues of the nurse educators with respect to the implementation of HFS, perceived issues which form the ground of research for this study. The researcher made use of guided small group discussions (nominal group technique) to collect data as recommended by Babbie (2016:90).

3.4 Research technique – the nominal group

The researcher selected the nominal group technique for this research study to describe the challenges nurse educators perceived to be facing with regard to the implementation of HFS at a public nursing college.

The **nominal group technique** (**NGT**) is a popular and effective group process involving problem identification, solution generation and decision-making (Delbecq & Van den Ven, 1971; Harvey & Holmes, 2012:188; McMillan *et al.* 2016:655-662). This research technique, developed by Delbecq and Van den Ven in 1968 (Delbecq *et al.*1975:5; Harvey & Holmes, 2012:188), is a planned small group discussion with the goal of identifying problems and finding solutions to them (Delbecq & Van den Ven, 1971:466; Harvey & Holmes, 2012:188; Botma *et al.* 2010:251). All participants are actively involved in the NGT (Harvey & Holmes, 2012:188; Islam, 2008:125), but with no direct individual interaction between group members taking place (Delbecq & Van den Ven, 1971:466).

This concept was applied throughout the study, as participants directed all their interactions not through the researcher or each other, but solely through the facilitator.

The ideas generated during the process were based on a specific question (Harvey & Holmes, 2012:191). The facilitator communicated the following question to the participants:

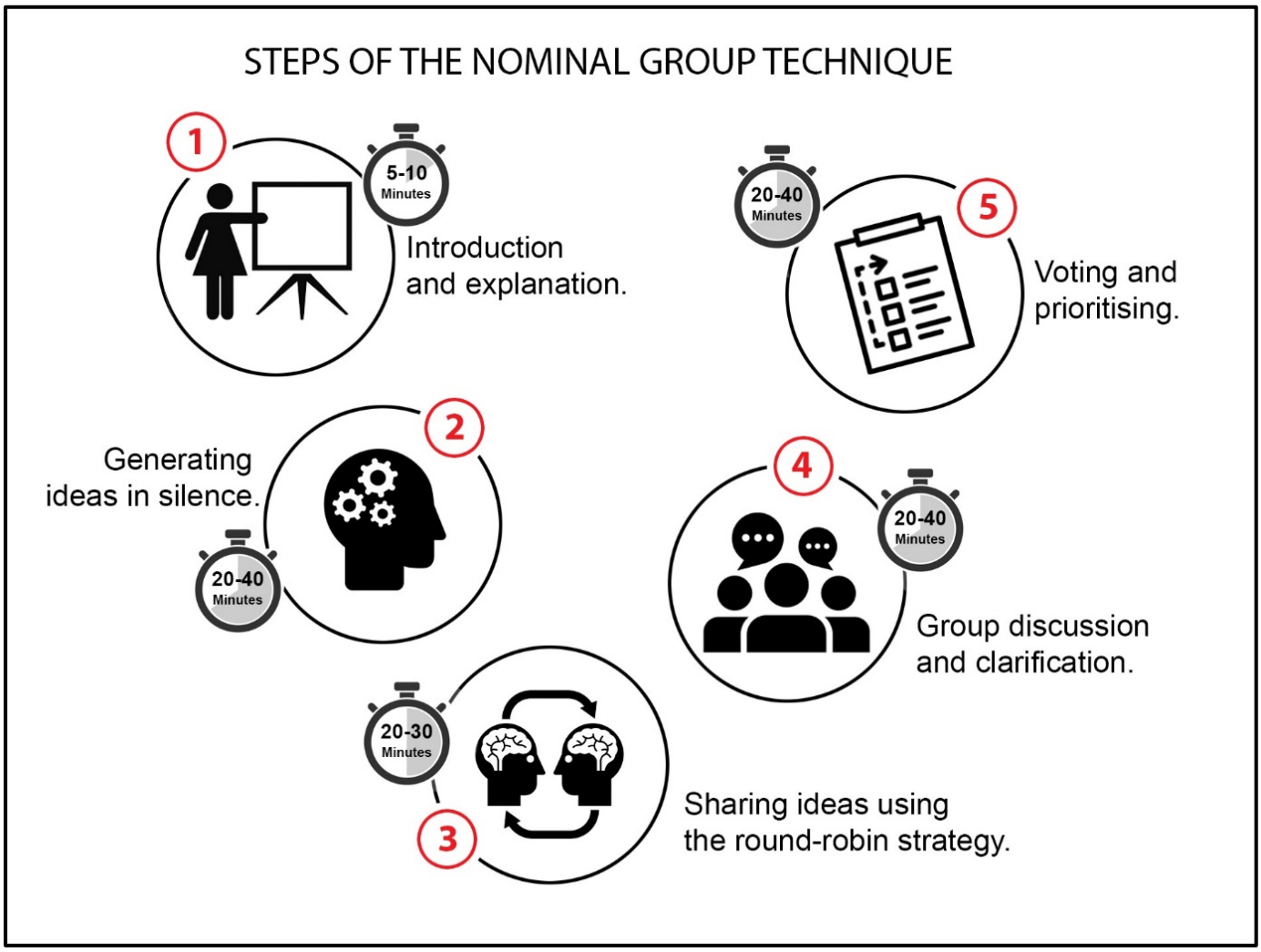
> ***What, in your opinion, are challenges facing nurse educators with regard to the implementation of HFS at Free State nursing college? Please list these challenges.***

The NGT question clarifies the objective of the meeting and illustrates the desired responses in terms of the level of abstraction and scope (Creswell, 2012:105). The question is frequently posed in a pilot test prior to the actual research to test its effectiveness. This is known as an explorative interview and will be discussed under 3.7.

The researcher of this study utilised the nominal group technique since this research technique allowed the group to identify, clarify, discuss and prioritise challenges faced as nurse educators regarding the implementation of HFS at various campuses of the NEI. The NGT has been adapted by researchers to suit the individuality of each study (Dobbie *et al.* 2004:402). For purposes of this research, the NGT was conducted using

the following five steps (Harvey & Holmes, 2012:191; Potter *et al.* 2004:128) as described in figure 3.1:

Figure 3.1 Five steps of nominal group technique.



Nominal group discussions were held at the campuses of the NEI. The steps that were followed are discussed in more detail under 3.8: Data Collection.

3.5 Population

Population is the “entire aggregation of cases in which a researcher is interested in” (Polit & Beck, 2012:273). According to Burns and Grove (2009:344), the concept of population comprises all elements (events, individuals, substances or objects) meeting the sampling criteria to be included in a study, whereas the population concept is described by Brink *et al* (2012:131) as all the persons who meet the conditions that the researcher is concerned about within the study. Polit and Beck (2012:274) make a distinction between target and accessible population. The first is the aggregate of cases that conform to the chosen criteria and that are available for a study. The latter is the aggregate of cases about which the researcher would like to generalise.

The population of this study included all the nurse educators employed at the three campuses of a public nursing college, which comprised 65 nurse educators. Campus A had 31 nurse educators, Campus B had 14 nurse educators and at Campus C there were 20 nurse educators.

3.6 Unit of analysis

The unit of analysis or sample population constitutes a group of people, happenings, conduct or other elements that have been chosen for a specific research study (Burns and Grove, 2009:343; Botma *et al.* 2010:290). The choice of a unit of analysis inevitably takes place when the problem to be researched is identified (De Vos *et al.* 2011:107). The unit of analysis for this study comprised 15 nurse educators who gave voluntary informed consent to take part.

Purposeful sampling uses participants who are experienced and knowledgeable about the subject researched, and is often used in qualitative research (Brink *et al.* 2012:141). Due to the involvement of nurse educators employed at the NEI taking part in the study in the implementation of HFS at the campuses, purposive sampling was conducted. Nurse educators at the campuses of a NEI who provided voluntary informed consent to take part in this study and who were conversant with the official language, English, formed the unit of analysis for this study.

3.6.1 Inclusion criteria

The inclusion criteria for this study were the following:

All participants:

- Who worked as nurse educators at a NEI for six months or longer prior to the conducting of the study and are responsible for the implementation of HFS.
- Who were willing and available to participate, and who gave voluntary informed consent.

3.6.2 Exclusion criteria

The exclusion criteria for this study were the following:

All participants:

- Who worked as nurse educators at a NEI for less than six months prior to the study.
- Who were not willing to participate.

3.7 Exploratory interview

An explorative interview is a practice performed in preparation for the larger research interview (Polit & Beck, 2012:563), using a smaller sample of the population that may be included in the main study if the question remains the same (Botma *et al.* 2010:291). Polit and Beck (2012:563-564) describe a pilot study, also known as a feasibility study, as a trial run done in preparation for a major research study. This serves to indicate the effectiveness of the questions asked, and to identify areas that may need attention early on, thereby saving money and time when the larger interview and data collection is compiled (Van der Merwe, 2005). Probability does not normally play a large role in the pilot study of a qualitative research paradigm, because the researcher does not plan to generalise the findings (De Vos, 2011:237).

Due to the limited population taking part in the study, the UFS School of Nursing Evaluation Committee allowed the proposed research question to be scrutinised by experts in nursing research, teaching and simulation (Brink *et al.* 2012:174; Burns & Grove, 2009:44), to evaluate whether the question was clearly understandable, and to identify and correct any possible misperceptions encountered. Four experts in qualitative research, including three PhD holders - one of whom is a high fidelity simulation authority - and one PhD candidate associated with UFS, were approached and asked to evaluate the research question to be given to the participants. The said experts were of the unanimous opinion that the proposed question was effective, clearly understandable, and susceptible of the possibility to collect the data required. The researcher left the proposed question as originally submitted for approval. Copious data was obtained during the NGT sessions, indicating that the question was well understood by the participants.

3.8 Data collection

Data collection pertaining to qualitative research is divided into five steps: obtaining permission and admission into the institution being researched; identification of participants and environment; determining the type of data to be collected; development of data collection document and executing the research in an ethically acceptable way (Creswell, 2012:204). The researcher adhered to the above steps by implementing certain measures:

3.8.1 Obtaining consent

After permission to conduct the research study was obtained from the relevant institutions, eligible participants gave voluntary informed consent prior to commencement of data collection, as Creswell (2012:205) has described. Informed consent has been discussed more fully under the heading of ethical issues.

3.8.2 Determining dates

The liaison person identified by the Department of Health for purposes of this research was the acting principal of the three campuses. The researcher consulted with the liaison person in order to discuss the research and data collection dates. The finalised dates were confirmed by means of e-mail and telephonic communications with the three campus deans: one of whom - the liaison person - holds the dual role of both acting principal and dean (Appendix 4). Communication was held with the deans in their capacity as gatekeepers (cf. Ethical Considerations 3.12.2 for detailed discussion of gatekeepers). Proof of permission from the Department of Health and the University of the Free State Health Sciences Research Ethics Committee served as attachments to the e-mail. Telephonic follow-up of data collection dates and reminders thereof were communicated on two occasions prior to the data collection process commencing.

3.8.3 Recruitment of participants

During qualitative research, participants are purposefully chosen by the researcher (Creswell, 2012:205). Therefore, for the purposes of this study, the researcher intentionally selected educators working at the public NEI identified to investigate challenges facing nurse educators in the implementation of HFS. Gatekeepers met with prospective participants and obtained verbal consent. Informed written consent was obtained by the facilitator before each NGT session commenced (cf. Ethical Considerations 3.12).

Nurse educators at each campus who met the requirements of the inclusion criteria were invited to attend the nominal group technique session in order to identify the challenges faced by themselves in respect of HFS and the implementation thereof in the new undergraduate nursing curriculum (2020). An information brochure was also made available, which explained informed consent (Appendix 5) and the voluntary nature of the informed consent form, as well as the right of the potential participants to withdraw from the study at any point.

3.8.4. Preparation for the NGT groups

Venues and general preparations for nominal groups to take place are required to meet certain criteria.

3.8.4.1 Criteria for the venues

Burns and Grove (2009:543) and Delbecq *et al*. (1975:41) specify that the venues should be able to comfortably accommodate five to nine chairs and tables positioned in a U-shape, with a flip chart placed at the open end for the facilitator to record each participant's responses. Venues need to be located in a quiet setting in order to enable

critical thinking. The environment must also be familiar to the participants in order to reduce feelings of intimidation and anxiety (Gallagher *et al.* 1993:79)

Initially, the venues for the data collection were to be the boardrooms of each of the respective campuses. Upon reflection, the researcher decided to opt for the smaller classroom venues instead, being familiar and friendlier, and since the groups were smaller than originally anticipated. The classrooms were located in quiet, secluded areas of the campuses. The illumination of the classrooms was adequate due to large windows, which were opened to ensure a comfortable temperature. Fans were made available in case of necessity.

3.8.4.2 General preparation

Essential preparation had to be made by the researcher before the NGT groups could take place. This included meeting with the group facilitators, ensuring that the NGT question was correctly formulated and printed and in the participants' file (Harvey & Holmes, 2012:189).

On the day of data collection, the researcher prepared the classroom by arranging the desks and chairs into a U-shape and ensured that the following items were in place:

- Each participant was given an information brochure file which included the following: A4 papers featuring the research question in print, writing paper, stick-it cards for their allocation of marks and a black pen.
- Stationery for the NGT-facilitator: flip charts and pens, a white board and pens, writing pad and Prestik were placed on a desk beside the facilitator, who preferred to work directly with the participants, without an assistant.

- Water, drinking glasses and bonbons were placed on the tables for the participants.
- A clearly visible wall clock.

The facilitator allowed sufficient time for feedback and discussion to ensure that the sessions were successfully conducted.

3.8.4.3 The facilitator

An experienced NGT facilitator in possession of a Master of Nursing degree facilitated Campus A, and was assisted by another Master's NGT alumna who then facilitated Campus B in exactly the same way. This alumna was also available to facilitate Campus C which unfortunately could not take place.

3.8.4.4 Dates and times of NGT sessions

The researcher made appointments as mentioned before and had secured the following dates for data collection:

Campus A: Monday 28 October 2019 from 10h00 till 13h00.

Campus B: Friday 01 November 2019 from 10h00 till 13h00.

Campus C: Wednesday 30 October 2019 from 10h00 till 13h00

Due to unforeseen circumstances, NGT session at Campus C did not take place, see 3.9.3 for comprehensive explanation why not.

3.8.5. The nominal group technique

Information was gathered through NGT groups and the facilitator directed the groups in accordance with the following steps:

3.8.5.1 Step 1: Introduction and explanation

The facilitator welcomed all the participants and after an ice-breaker briefly explained the goal of the study once again, and followed this with a brief explanation and summary of what the NGT constitutes and how it would be directed. She thanked participants for their presence and willingness to partake in the study without receiving any remuneration. Participants were asked to respect one another's opinions and contributions, and maintain group confidentiality. Voluntary informed consent forms were then signed.

3.8.5.2 Step 2: Generating of ideas in silence

The intended question was given to the group both verbally and in writing. All participants were given time to write down and reflect upon the challenges facing nurse educators with regard to the implementation of HFS at a public nursing college. This was done in silence, without interaction between individuals or intrusion from the facilitator. The participants indicated when they had completed the work by putting down their pens.

3.8.5.3 Step 3: Sharing ideas by round-robin strategy

Next the participants in turn shared their responses with the facilitator and the remainder of the group, sharing one opinion at a time. Participants were asked not to repeat any responses that had already been given in feedback and were encouraged to add to their list new responses that occurred to them during this time and share them. All the responses were recorded on the flip chart. Participants were requested not to comment on or discuss any of the comments given during this step. Thus the possibility of intimidation among participants was avoided. This process was repeated

until all the responses were exhausted. See figure 3.2 for seating arrangements for the nominal group discussion and direction of flow for the round-robin strategy.

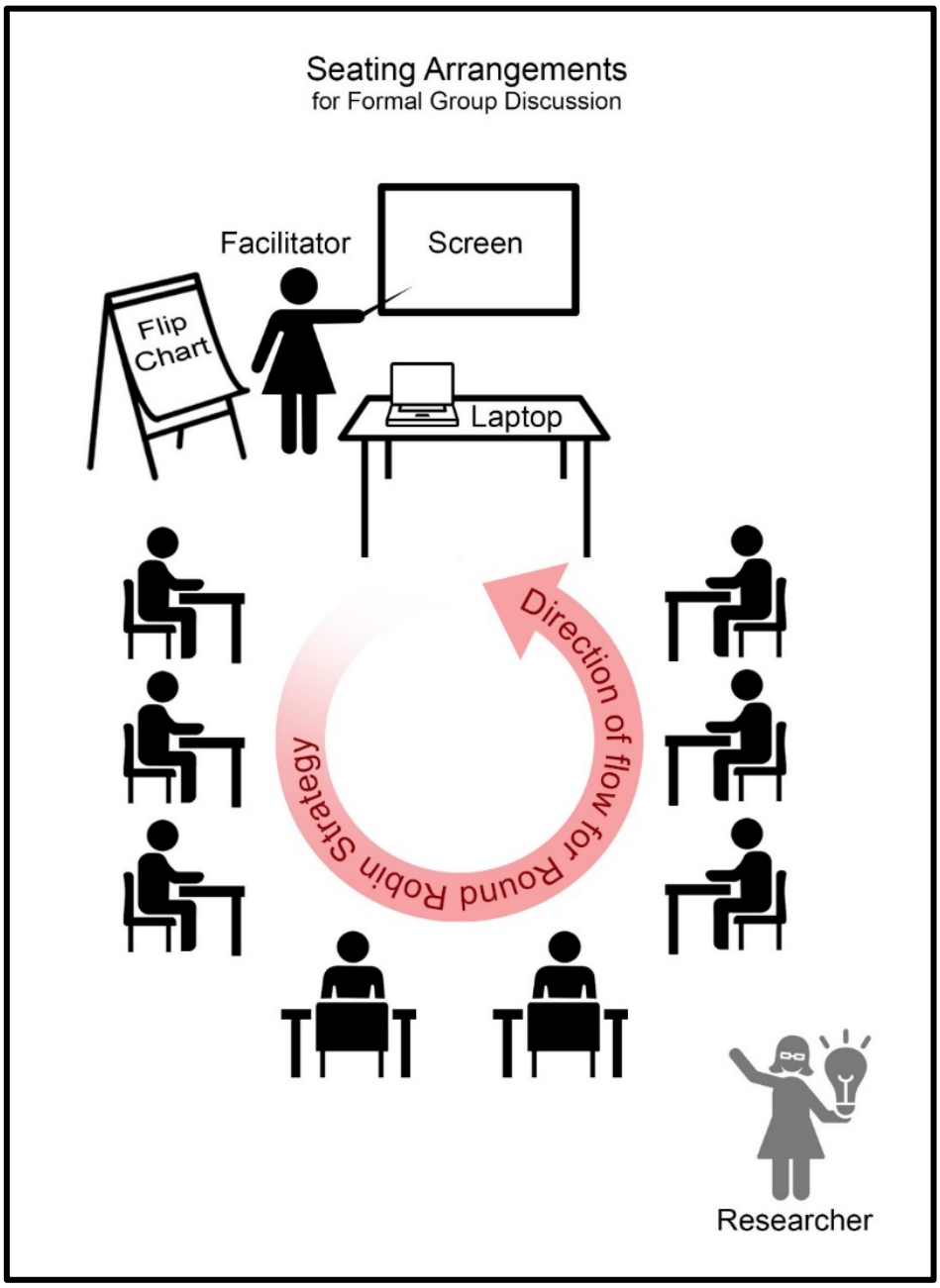


Figure 3.2: Seating arrangements for the nominal group discussion and direction of flow for the round-robin strategy

3.8.5.4 Step 4: Group discussion and clarification

Each response recorded on the flip chart was then discussed and scrutinised by the group. During the discussion, some responses were withdrawn while others were clarified and added to. The facilitator facilitated the group throughout and ensured that all participants were given a fair opportunity to explain their opinions and take part in the discussions freely without possibility of intimidation from their colleagues. Similar responses were grouped together with the use of a different colour marker, until all members of the group were satisfied with the final list of answers. Key words or phrases of each response were underlined. The updated list on the flip chart was then re-numbered with another different colour marker. The red writing in Table 3.1 and Table 3.2 indicate the additional responses during the discussion step.

3.8.5.5 Step 5: Voting and prioritising

The participants selected their five most important responses from the final list. They were given five stick-it cards (also known as post-it notes), one card for each response selected before being asked to write down the keyword or phrase in the centre of the stick-it card. Each participant was asked to put their finger on the response they considered to be of most importance. Participants were then invited to write the number as it was given on the flip chart in the left upper corner of the stick-it card and a five (5) in the right lower corner of the card. Next, they chose what they considered their least important response and repeated the process, giving it a one (1) in the right lower corner of the stick-it card. Participants were then asked to affix their responses onto the flip chart, beside the corresponding number in the left upper corner. This exercise strengthened trustworthiness and enabled the participants to feel more closely engaged with the process. Next, they had to select their most important response from the remaining three stick-it cards, put their finger on it, give it a four (4)

in the right lower corner and write in the corresponding number from the flip chart in the left upper corner of the card. Participants next had to choose their least important response from the remaining two (2) cards and give it a two (2). The remaining card was given a three (3) before all the cards were affixed to the flip chart. The facilitator and participants checked that all the right cards were in the right places and that the number of responses tallied with the number of participants. See figure 3.3 for the example of a stick-it card.

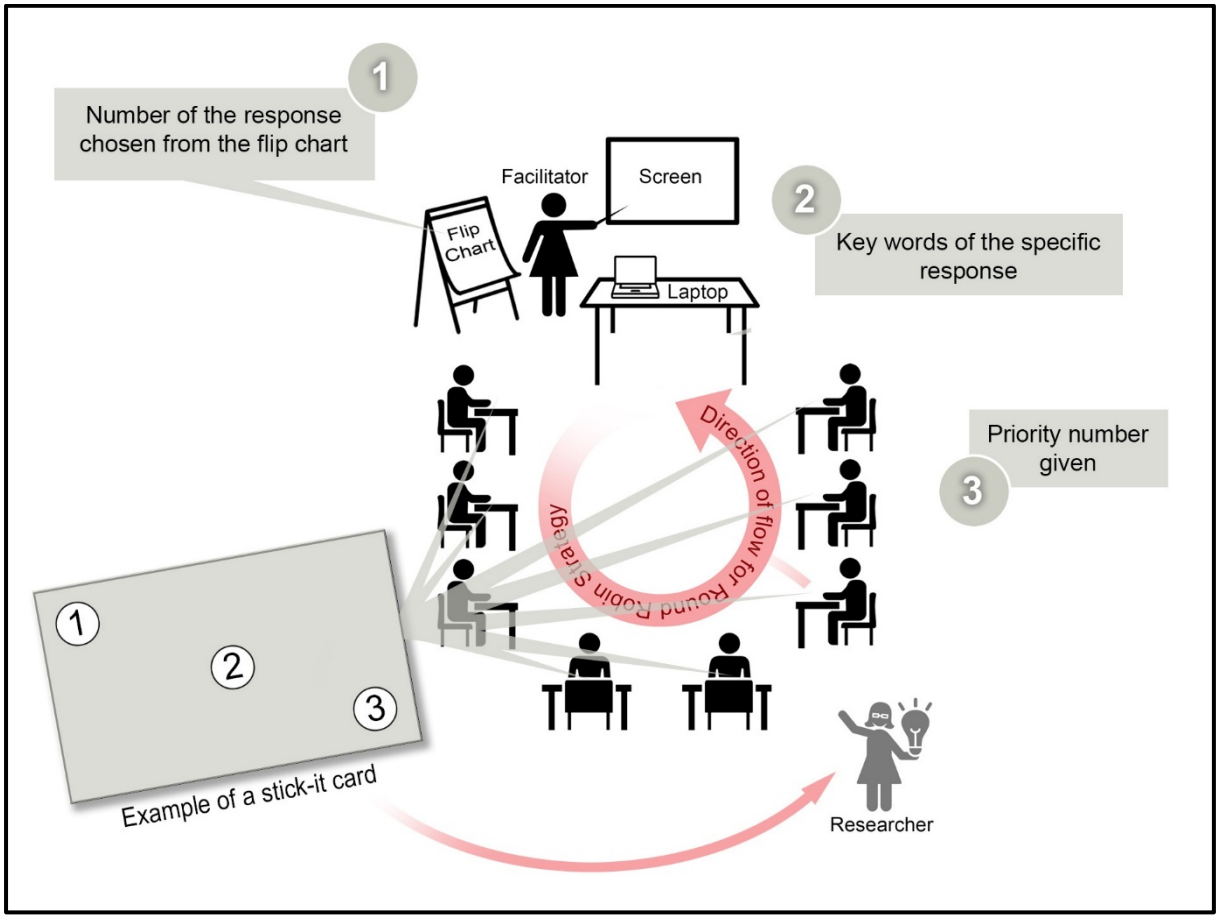


Figure 3.3 Example of a stick-it card

The total points for each response were written down and added. The grand total of points for each response were then presented and checked by the participants.

Finally, the responses to the exercise were prioritised according to the points obtained. The card counts of each participant were recorded beside each corresponding response on the flip chart. When all the participants had provided their top five responses, the points given to each response were added and the total points for each response were recorded. Table 3.1 illustrates challenges listed by campus A in order of priority.

Table 3.1: Challenges listed by campus A in order of priority[1]

No. OF CHALLENGE	CHALLENGE	VOTES	PRIORITY
4.	Readiness of staff *-Lack of knowledge of new curriculum* *-Fear of unknown* *- Lack of knowledge about HFS*	5+4+4+4+2+ 5+5+4 = 33	1
13.	Attitudes *-of all stakeholders (lecturing, finance, students, admin)* *-Management* *-Support (crisis) and buy in (of management)* *Lack of emotional intelligence* *Influence of different stakeholders*	4+1+5+2 +3 = 15	2
2.[1]	Purchasing cost *-initial* *-cost of resources* *-manikins and learning aids* *-computers* *-not enough manikins and learning aids*	5+2+3 +4 = 14	3
5.	Infrastructure *-Space for the lab* *-Safe* *-Renovation* *-Moving around*	1+5+2+2 +3 = 13	4
1.	Discomfort / *fear* with technology	4+4+3	5

[1] Tables 3.1 and 3.2 are exact replications of the information recorded on flip charts, including grammar and spelling, as completed by the facilitator from information gained from participants during steps four and five of the NGT sessions.

No. OF CHALLENGE	CHALLENGE	VOTES	PRIORITY
	-Lecturers older, not used to technology *-students born in technology era but deprived* *-older students* *-students with lack a of computer/technical experience*	+1 = 12	
7.	Time management / allocation *-Optimal use of HFS* *-Enough preparation time* *-Co-ordination of whole three year programme* *-? Booklet of simulation programme*	1+2+1+1 +3 = 8	6
14.	Preparation of stakeholders -*Short courses – staff* *-Info day for support staff* *-Purchasing office / supply chain management* *-up to date knowledge on HFS*	5 + 3 = 8	7
9.	Large number of students *-to facilitate* *-Ratio of manikins for campuses take into consideration*	2+3+2=7	8
6.	Funding for operational equipment -*For sustaining the simulations* *-Maintenance of mannikins* *-Back up if equipment is broken – no money*	3+1+2=6	9
3.	Employment of staff *-preceptors* -*a technician* *-DoH to create posts and funds* *-availability of a technician*	5+1=6	10
11.	Standard for HFS sessions *-Set a standard for HF sessions and lab rules – current lack*	5	11
16.	Staff must be exposed to clinical setting to improve authenticity of lab / HFS sessions	4	12
10.	Safety of equipment *-And security of equipment*	3	13

No. OF CHALLENGE	CHALLENGE	VOTES	PRIORITY
	-Policy *-Implementation*		
12.	Loadshedding[2] *-Generator* *-Battery charger*	1	14
8.	Authenticity of HFS sessions *-How far can you take the authenticity?* *-Intergrate disciplines* *-Holistic approach* *-stereotyping of scenarios in terms of the discipline (one discipline)*	0	15
15.	Correct qualifications that educators should have	0	16

As with Campus A, Campus B's participants also listed their challenges and voted for their top five, resulting in Table 3.2.

Table 3.2: Challenges listed by campus B in order of priority

No. OF CHALLENGE	CHALLENGE	VOTES	PRIORITY
1.	Lecturers lack of knowledge *-How to operate the simulator* *-Computer literacy to operate simulator*	5+5+5+ 2+3+5 = 25	1
2.	Enough finances *-More manekins*	5+5+3+ 4 = 17	2
8.	IT support *-needed*	2+4+3+ 2+2 = 13	3
7.	Infrastructure *-Space* *-Equipment storage*	3+3+4+ 2 = 12	4
4.	Enough space	4+4+4=12	5
5.	Availability of electricity *-Back up / solar*	2+1=3	6
6.	Control room *-For simulator*	3	7
3.	Lack of manpower *-Not enough lecturers* *-Somebody to operate manekins*	1+1=2	8

[2] Loadshedding - scheduled rolling blackouts.

No. OF CHALLENGE	CHALLENGE	VOTES	PRIORITY
11.	Number of students	1+1=2	9
10.	Care of manekins	1	10
9.	Security *of manekin* *-?Camera* *-?Burglar proof*	0	11

Both groups appeared to be interested in the topic. Participants from both campuses actively took part in the sessions and contributed generously to the challenges they were facing with implementing HFS. Discussions were thorough and points made discussed and reasoned out among the participants, who enjoyed playing an active role in the research process and felt part of the research study, eager to see the final results. Both groups commented on how much they enjoyed the nominal group technique and how interesting and informative the technique was. Participants were aware that they could withdraw from the discussion at any time they felt the need to do so. All the participants had an equal opportunity to state their opinions and there was no domination from any source (Dobbie *et al.* 2004:405; McMillan *et al.* 2016:655-662; Harvey & Holmes 2012:190).

3.9 Narrative of the nominal group technique sessions

3.9.1 Campus A

Campus A is located in a large, wealthy cosmopolitan city in Central Free State area. The students are drawn from the Southern and Central Free State area. There is sufficient accommodation available for the students on and around the campus. There are also sufficient classrooms and offices for nurse educators. Programmes presented include R425 (Diploma in Nursing), R683 (Bridging Course), Midwifery and Critical Care speciality course. The nine participants who took part from this campus showed

interest in the research and a pleasant session was held with them. The researcher, after first ensuring that the participants had no objection, sat in a desk behind and away from the participants and did not take part in the discussions at all, only taking field notes and observing the proceedings. The group interacted well and enthusiastically with one another, readily discussing HFS and the challenges they faced with its introduction into the curriculum in the New Year of 2020. The session took longer than expected and afterwards the group expressed their enjoyment in taking part and felt they had been given an opportunity to identify and articulate their challenges with HFS, for which they were grateful.

3.9.2 Campus B

This Campus is located in a rural Eastern Free State town with less-developed infrastructure than that available in urban areas. It is much smaller than Campus A with students drawn from the Eastern Free State area. There is limited available accommodation on and around the Campus. Programmes presented here are the R425 (Diploma in Nursing), R683 (Bridging course) and Midwifery speciality. This Campus has basic challenges such as regular shortages of water and interruptions of electricity supply. The researcher and facilitator were once again warmly greeted by management and accompanied to where the nominal group session was to take place. Once again, the researcher prepared and arranged the venue accordingly. The participants took their places and the session started.

The participants were very co-operative with the facilitator and took an active part in the discussions. The researcher once again, after first ensuring that the participants had no objection, sat behind the participants and took field notes, being careful not to take part in any discussions or influencing the participants. The group was smaller than the one on Campus A, with six participants taking part. Data obtained from them

was very similar to Campus A and the group displayed an interest in the question and co-operated well with the facilitator, although the researcher did find them to be somewhat less spontaneous than Campus A, perhaps because of the smaller number and familiarity. All participants actively took part in the session and also verbalised afterwards that they had enjoyed the session and were grateful for an opportunity to explore the challenges they as colleagues were facing in terms of the implementation of HFS at their Campus.

3.9.3 Campus C

Campus C is located in a gold-mining city in Northern Free State, with students drawn from the Northern Free State. There is sufficient accommodation available for the students on Campus. There are also sufficient classrooms and offices for nurse educators. Programmes presented include R425, R683 and Midwifery speciality course.

Campus C failed to achieve a quorum upon the pre-arranged time and date of data collection. Nine participants had indicated verbal consent to take part in the NGT data collection. Three of the nine participants arrived for the NGT thus resulting in quorum failure. The researcher endeavoured to recruit other nurse educators without success. The researcher and NGT facilitator waited for an hour in case any of the nurse educators became available. Thereafter they left Campus C for the city they had set out from earlier in the day.

Collected data at Campus A (9 participants) and Campus B (6 participants) proved to be sufficiently rich with plentiful and similar identified challenges. The study leader, pursuant to consultation with other researchers in the School of Nursing, deemed that the study was uncompromised due to satisfactory data. The university has a time limit

to complete a Master's degree and this constraint would have been compromised if further time had been spent trying to organise another visit to Campus C for data collection. The NEI itself was preparing for examinations and therefore the data collection would only have been able to take place in 2020. Valuable months for data analysis and completion of the study would have been lost. Finally, the advent of the Covid-19 pandemic rendered any ultimate attempt at collecting data from Campus C impossible. The institute further recognised the logistics surrounding the expenses and challenges a further quorum venture would entail and thus recommended that the researcher continue the project with the existing body of data.

3.10 Analysis of nominal group data

Data analysis is an ongoing process and one of the most critical phases in a qualitative research study (Savin-Badin & Major, 2013:447-449). During step three of the NGT the participants started with content analysis of the data (Van Breda, 2005:5). The researcher further used content analysis to scrutinise the data. Content analysis is a straightforward method of reducing, processing and analysing data. It entails the systematic classification and coding of data into topics or ideas, which form the basis of data analysis (Burns & Grove, 2009:528, Cohen & Morrison, 2007:475; Moule *et.al.* 2009:349).

For purposes of this study, the researcher decided to make use of Van Breda's seven steps (phases) for analysing multiple-group NGT data (Van Breda, 2005:4-11). At phase three of Van Breda's data analysis process, the researcher made use of Tesch's data analysis process (cited by Creswell, 2014:198). The researcher substituted the word "steps" used by Van Breda with the synonym "phases" in order to avoid confusion and to differentiate clearly between the steps used in the nominal group technique and Van Breda's seven phases, which are as follows:

Phase 1	All data collected is entered into a computer
Phase 2	The top five statements are identified and prioritised
Phase 3	The content of the data is analysed
Phase 4	The findings of this analysis are confirmed
Phase 5	The various groups' data is combined in order of importance
Phase 6	The demographical groups' data is compared (optional)
Phase 7	The NGT data is reported on

As the researcher had fewer groups than those researched by Van Breda (2005:1), some of the steps were not used in their totality, but rather as a guideline instead. Once the data had been analysed, the value of the research became evident. The researcher identified themes using Tesch's eight phases in the coding process, as outlined by Creswell (2014:198) in Table 3.3.

Table 3.3: Tesch's Eight Step Coding Process.

Step 1: Read through all the participant's inputs carefully. Write down any ideas that may come to mind as one reads.
Step 2: Choose a document and go through it, asking what it is about, concentrate on the fundamental sense of what has been written, writing thoughts in the margin.
Step 3: Repeat this for a few documents. Identify all the topics identified, cluster similar topics together and put them into columns.

Step 4: Together with this list, return to the data and abbreviate topics as codes, entering these at applicable parts of the text. Identify any new categories or codes that develop.
Step 5: Search for most descriptive wording for the topics and turn them into categories. Group topics are related together, thereby reducing the list of categories.
Step 6: Decide on the abbreviation for each category and place these codes into alphabetical order
Step 7: Place all the data material belonging to each category together and complete a preliminary analysis.
Step 8: Recode existing data if necessary

The data analysis followed an inductive approach where the researcher allowed the data “to speak for itself” by the emergence of conceptual categories and descriptive themes. The researcher remained open-minded about multiple possibilities or ways to consider what the participants were expressing in the data. The researcher therefore became immersed in the data in order to recognise meaningful patterns and themes, making notes throughout. Cleland (2017:67) states that “a good qualitative research has a logical chain of reasoning, multiple source of converging evidence to support an explanation, and rules out rival hypotheses with convincing arguments and solid data”. The data was repeatedly scrutinised by the researcher and focal points of the participants’ inputs were identified. The researcher examined the collected data pertaining to the research question in minute detail. Particular cognisance was taken of similarities and the repetitive underlying gist of the participants’ responses. Themes were independently identified and relevant findings categorised by the researcher and co-coder. This was done in order to reflect a fully accurate representation of the data analysis with regard to the challenges identified by the participants. All the top priorities

voted for during the NGT sessions were included during the data analysis and incorporated into the themes.

Table 3.4 is an example of the themes, categories, subcategories and responses agreed upon by the researcher and co-coder, revealing a commonality in the data conclusion. Participant code e.g. Group A4 indicates a response or an excerpt from a response of participant 4 in Campus A.

Table 3.4: Example of the themes, categories, sub-categories and responses.

THEMES	CATEGORIES	SUB-CATEGORIES	Responses	Participant
4.7.1. Stakeholders	4.7.1.1 Finances	Initial cost	”No money to buy”	Group A4
			“No high fidelity manikins”	Group B5
			“Money to equip the lab”	Group A2
			“Procurement”	Group A9
			“Finance to purchase?? Cost per doll/procedures”	Group B4
			“Lack of finances”	Group A7
			“Financial resources”	Group A8
			“Cost”	Group A9
			“Budget”	Group B5

THEMES	CATEGORIES	SUB-CATEGORIES	Responses	Participant
		Funding for operational equipment	”Funding”	Group A3
		Sufficient finances	”Contract and follow-up service plans from suppliers lack (maintenance)”	Group A4
			“Broken equipment not serviced – not repaired”	Group A9

The researcher ensured trustworthiness throughout the study, from data collection through to data analysis and presentation of the findings, as recommended by Cleland (2017:68).

3.11 Trustworthiness

Trustworthiness of a qualitative study may be achieved by applying the four criteria proposed by the model of Lincoln and Guba in 1985, namely credibility, dependability, confirmability and transferability (Brink *et al.* 2012:172; Cleland, 2017:68-69). Polit & Beck, (2012:745) added a fifth quality to trustworthiness, namely authenticity. The researcher used all the criteria to increase the trustworthiness element of this research.

3.11.1 Credibility

Credibility entails qualitative researchers' quest for the truth, for honesty and for trustworthiness in their findings and in the contents of their research (Polit & Beck, 2012:585). Credibility is enhanced when data is returned to the participants to allow findings to be verified and confirmed (Creswell, 2012:259). Validity may also be strengthened by implementing credible strategies such as member checking, group discussion and using an authoritative researcher (Botma *et al.* 2010:233). The correct participants (nurse educators) took part in the NGT, ensuring credibility of the results. During the NGT, participants were involved in group discussion and were each given equal opportunity to partake in verbalising ideas through step 2 of the NGT and in gathered data checking. The NGT facilitator leading the group was an experienced, authoritative facilitator with a post-graduate degree in qualitative research in nursing education, further strengthening the credibility of this research. After the data collection an experienced co-coder assisted the researcher in terms of data analysis, thereby further increasing credibility of the study.

3.11.2 Dependability

Dependability refers to the stability of data over time and circumstances (Polit & Beck, 2012:585). The repetition of the study by a colleague or a review audit may likewise increase the dependability or consistency of the study (Botma *et al.* 2010:233). Although no immediate repetition of this study is foreseen, all documentation collected during this research study will be in the safekeeping of the researcher in case of enquiries or possible investigations (Creswell, 2012:260).

All data was checked by a second party, (a lecturer at the UFS School of Nursing and a qualitative research expert), before and after being captured on the computer.

3.11.3 Confirmability

Confirmability means that the findings represent the information given by the participants (Polit & Beck, 2012:585) and are supported by the data obtained (Brink *et al.* 2012:127). All original written responses of the participants were collected and have been carefully and safely stored, thereby confirming that they demonstrate the original inputs of the participants and exclude possible researcher bias as recommended by Botma *et al.* (2010:233). All the collected data leaves an audit trail which has been carefully secured and is available for inspection if necessary. The qualified facilitators of the NGT contribute to the confirmability of the data, as well as the participants themselves by peer reviewing one another during the NGT process.

3.11.4 Transferability

Transferability refers to the applicability and generalisation of the study. The findings must be transferable to other populations and may be strengthened by criteria such as source selection (Botma *et al.* 2010:233). The researcher has to describe and produce accurate results so that others may be enabled to decide whether the study is applicable to them or transferrable to their situation (Polit & Beck, 2012:585). The researcher of this study has identified the type of workplace and occupations of the participants involved. Other investigators in similar situations are free to look at this description and decide for themselves whether the information gathered by this research is applicable or transferrable to their situation

3.11.5 Authenticity

Authenticity emerges in a study when the feelings of participants' lives as they are lived is conveyed. It also refers to the extent in which the researcher shows a range of realities truthfully (Polit and Beck, 2012:585). The researcher strove to give an

authentic picture of what the participants perceived as challenges facing them in the implementation of HFS. Trustworthiness of data played a vital role in this research study, and the researcher endeavoured to take other ethical considerations into account.

3.12 Ethical aspects

Researchers throughout their research are obliged to adhere to the basic ethical principles of respect for persons, beneficence and justice (Brink *et al.* 2012:34). Ethical aspects need to be enforced through procedures when individuals take part in research, as their rights must be protected (Polit & Beck, 2012:150). In compliance therewith, the proposal of this study was submitted to, and approved by, the Evaluation Committee of the Free State School of Nursing, the HSREC, and the Research Committee of the DoH. The researcher also made use of gatekeepers.

3.12.1 Institutional approval

A study proposal was completed and approval for the research to be carried out was obtained from the following institutions in the following order:

- *UFS School of Nursing Evaluation Committee*
- *UFS Health Sciences Research Ethics Committee* (HSREC see Appendix 1)
- *Free State Provincial Health Research Committee* (DoH see Appendix 2 & 3)
- *Acting principal of the public nursing school* (see Appendix 4)
- *Deans of each campus* (see Appendix 5)

The dean of each campus played the role of gatekeeper for the participants. Botma *et al.* (2010:216) emphasises the importance of obtaining permission from all relevant stakeholders, gatekeepers and people involved in the study. Thus all individuals directly involved in the study should be consulted.

3.12.2 Gatekeepers

Ethically, the term “gatekeeper” refers to the person who liaises with the researcher and the potential participants. This person is usually in a managerial position and has the authority to grant permission for the researcher to enter the institution and meet with the participants (Botma *et al.* 2010:216; Denscombe 2012:71).

The gatekeepers for this study were the deans of the three campuses of the NEI. As discussed earlier, they were actively involved in finalising dates and were reminded of the impending research the week before and again on the day before data collection was to take place at their facility.

3.12.3 Respect for persons

Respect for persons includes the participant’s right to choose whether or not to take part in the study and to withdraw at any given point without penalty. This includes beneficence, respect for human dignity, and justice. A risk-benefit assessment should be conducted before the research study commences (Burns & Grove, 2009:188, 190; Polit & Beck, 2012:153-156). The researcher ensured that all information was given to the participants beforehand, and all questions or concerns had been reasonably addressed. Finally, voluntary informed written consent, as discussed in detail below, was obtained from all participants before the study commenced.

3.12.3.1 Informed consent

Informed consent requires that the participants must be given full information regarding the research, comprehend this information, and have the capability to give or withhold consent (Polit & Beck, 2012:157).

Informed consent consists of various aspects, as set out by Polit and Beck (2012:158) and Dhai (2019:65, 86). These include the participant’s title, aim of the study, type of

data to be collected, all procedures to take place, the nature of their relationship with the study, sponsorships, selection of participants, potential risks, potential advantages and disadvantages, alternative compensation, confidentiality, voluntary participation, the right to withdraw or withhold information, and the contact person's details. The researcher drew up an information leaflet (Appendix 5) consisting of all the information requested to conform to the requirements of the Faculty of Health Sciences Ethics Committee. The researcher also clearly stated in the leaflet that participants would receive no remuneration for taking part in the study.

All nurse educators were given the information leaflet and their questions were addressed by the researcher. Participants gave voluntarily informed consent to participate in the study and were requested to sign the consent form to ensure procedures were followed. Informed consent forms were collected by the researcher and kept with all other documentation in a secure place. These consents further increased the credibility of the study.

3.12.4 Beneficence

Beneficence necessitates that all the actions of the researcher are moral and correct, and are aimed at avoidance of harming the participants before other legitimate concerns (Burns & Grove, 2009:188; Polit & Beck, 2012:152). The researcher strove to protect the participants from all physical or emotional harm which might have arisen throughout the study by timeously identifying and excluding any potential threats that might have occurred. To the researcher's knowledge, none were either anticipated or experienced.

3.12.5 Justice

According to Burns and Grove (2009:188) and Polit & Beck (2012:155), people taking part in research should be treated fairly and have the right to privacy. The researcher reasonably ensured that all participants were treated with the same high degree of fairness, respect and courtesy throughout the study. The participants shared their inputs spontaneously throughout the NGT process without compromising their right of privacy, and were aware that no remuneration would be given.

3.13 Conclusion

In this chapter, the researcher discussed the research methodology in detail. Qualitative research design with NGT sessions as the research technique was successful in collecting data. The participants assisted in the beginning stages of data analysis which contributed to the trustworthiness of the study. In chapter four the findings of the nominal groups and the detailed analysis of the collected data together with supporting literature authenticating the findings will be discussed by the researcher.

CHAPTER 4: DATA PRESENTATION AND SUBSTANTIATION FROM LITERATURE

"If you can't explain it simply, you don't understand it well enough".

Albert Einstein

4.1 Introduction

The collection of data was comprehensively discussed in Chapter three, describing in detail how the researcher immersed in the data in order to be able to discern meaningful patterns and themes, making notes throughout the proses of data collection and analysis, and then using these notes to guide the analysis strategy. The researcher used content analysis to uncover the challenges perceived by nurse educators to be facing them in the implementation of HFS in the new undergraduate nursing curriculum. In this chapter the data analysis, the interpretation of findings and substantiation from literature has been dealt with.

4.2 Demographical data

The study involved fifteen nurse educators with high-level nursing qualifications living within the province of Free State, Republic of South Africa. The participants met the inclusion criteria which specified that they needed to have been employed at the NEI as nurse educators for at least six months before data collection, were responsible for the implementation of HFS at the public nursing college and must give informed consent. The researcher verified that all the participants met all the criteria.

As explained in chapter three, Campus C could not participate. Therefore the data-collection of the other participants was taken from Campus A and Campus B.

The demographics of participants from Campus A and Campus B as shown in comparison (see Table 4.1):

TABLE 4.1: Comparison of demographics of participants

CHARACTERISTICS	CAMPUS A	CAMPUS B
Age in years:		
30 – 39	2	-
40 - 49	2	-
50 - 59	4	5
60 - 65	1	1
Gender:		
Male	1	0
Female	8	6
Ethnicity:		
African	6	6
White	3	0
Highest level of education reached:		
B. Cur	5	5
B. Cur Honours	1	1
B. Adv. Nursing	2	0
M Nursing	1	0
Period working as a nurse educator at NEI:		
6 months – 9 years	6	2

CHARACTERISTICS	CAMPUS A	CAMPUS B
10years – 19 years	1	3
20 years – 29 years	2	1
nurse educators that have taken part in HFS short course training for health professions educators, presented by UFS:	1	0

The ages of the participants ranged between 30 and 65 years at campus A and between 50 and 65 years at campus B. The ratio at campus A was two participants in their thirties, two in their forties, four in their fifties and one in their sixth decade. The campus A ratio is thus 2:2:4:1. The ratio at campus B was five participants between the ages of 50 and 59 years and one in their sixties. Thus the ratio at campus B is 5:1.

The majority of the participants in this study were female. The composition of gender among the participants was predominantly female. The ratio of male to female participants within the two campuses was one male to eight females at campus A, and zero males to six females at Campus B. The ratio of male to female among participants was one male to 14 females. The ethnicity of the participants was six Africans at Campus B, while Campus A reflected a demographic of six Africans to three Whites.

The highest level of formal education of the participants was classified into four categories. The first category included participants with the B. Cur degree, the second those who hold the B. Cur Honours degree, the third category comprised B. Adv.

Nursing and the fourth M. Nursing. Campus A has five participants who hold the B. Cur degree; one participant with B. Cur. Honours, two participants with B. Adv. Nursing, and one participant with M. Nursing. Campus B has five participants who hold the B. Cur degree, and one participant with B. Cur Honours. The two campuses thus hold a mean ration of ten participants with B. Cur degree, two with B. Cur Honours, two with B. Adv. Nursing and one with M. Nursing.

The characteristics of the participants in terms of experience in nursing education ranged between six months and 29 years. Campus A had six participants in the six months to nine years range and one participant in the ten to 19 years range. Campus B had two participants with between six months and nine years' experience and three participants with between ten and 19 years nurse lecturing experience. Two participants from Campus A and one from Campus B fell in the 20 - 29 year range, spending the most time in the field of nursing education.

Only one participant took part in a HFS short course training for health professions educators presented by UFS: thus only one participant in Table 4.1 has formally undergone recognised HFS training.

4.3 Observation during data collection

In step three of the NGT, the sharing of ideas by round-robin strategy, 31 responses were listed by Campus A (73 inputs were registered on the participants' raw data written down by participants in step 2, but they had been asked not to repeat inputs already provided by another participant in step 3) and 15 responses by Campus B (31 inputs were registered on the raw data) regarding the research question, namely **"*What, in your opinion, are challenges facing nurse educators with regard to the***

implementation of HFS at Free State nursing college? Please list these challenges". These responses were discussed and clarified during step four of the NGT, further reducing campus A's inputs to 16 challenges recorded and that were finally voted on. Campus B's final number of challenges to be voted on after discussion and clarification was 11.

4.4 Data collected entered into computer

All data collected was entered into a computer by the researcher, assisted and monitored by another nurse educator. Appendix 6 illustrates an example of the first page of verbatim responses of participants from Campus A collected during step 2 of the nominal group technique: generating ideas in silence and writing them down.

4.5 Data analysis of the group responses

Analysis of this data was already started during steps three to five of the NGT by the participants themselves. Step three involved the sharing of challenges identified by the participants by using the round robin strategy as discussed in chapter three. There were a total of 104 responses between the two campuses.

During step four of the NGT, the group discussion and clarification of the responses, various responses were found to be the same or similar. The group incorporated these responses into one. In the final step of the NGT all participants had to choose their five most important challenges and allocate each one with a mark from one to five, five marks being the most important challenge they felt they were would be faced with and one for the challenge they felt was the least important of the five they chose.

With the assistance of the participants, the top five most important inputs identified by the group as a whole were identified and recorded. These steps have been thoroughly discussed in chapter three.

4.6 Groups' data combined in order of importance

In the comparison between campus A's and Campus B's challenges, illustrated in Table 4.2, it was evident that the challenges faced were perceived to be very similar by both campuses, expressing clear similarities in the priorities selected independently by each campus. When comparing campus A and campus B's data, it was evident from the similarities that data saturation has been reached.

TABLE 4.2: Comparison of challenges listed by campus A and campus B[3]

PRIORITY	CAMPUS A	CAMPUS B
1.	Readiness of staff to implement HFS programme (33)	Lecturers lack of knowledge (25)
2.	Attitudes of stakeholders (15)	Enough finances (17)
3.	Initial cost (14)	IT support (13)
4.	Infrastructure (13)	Infrastructure (12)
5.	Discomfort / fear with technology (12)	Enough space (12)
6.	Time management / allocation (8)	Availability of electricity (3)
7.	Preparation of stakeholders (8)	Control room (3)
8.	Large number of students (7)	Lack of manpower (2)

[3] The information in Table 4.2 comprises the verbatim priorities from Tables 3.1 and 3.2.

PRIORITY	CAMPUS A	CAMPUS B
9.	Funding for operational equipment (6)	Number of students (1)
10.	Employment of staff (6)	Care of manekins (1)
11.	Standard for HFS sessions (5)	Security (0)
12.	Exposure to clinical setting (4)	
13.	Safety of equipment (3)	
14.	Loadshedding (1)	
15.	Authenticity of HFS sessions (0)	
16.	Correct qualifications (0)	

Readiness of staff and lecturers' lack of knowledge received the highest votes. Attitudes of stakeholders and sufficient finances came in second, with initial cost and IT support third. Interestingly, both campuses identified infrastructure as their fourth biggest challenge with discomfort of technology and enough space featuring as their fifth biggest challenges respectively.

4.7 The findings of this analysis are confirmed

All findings were checked and re-checked independently by the researcher and another nurse educator as a co-coder and confirmed to be correct. Coding refers to the identification of topics, issues, similarities, and differences that are revealed through the participants' narratives and interpreted by the researcher. Sutton & Austin (2015:227) explained that this process enabled the researcher to begin to understand the world from each participant's perspective. They describe the most vital part in the

analysis and management of data as being “true to the participants”, and stated that “it is their voices that the researcher is trying to hear, so that they can be interpreted and reported on for others to read and learn from” (Sutton & Austin, 2015:227).

The researcher and co-coder analysed the participants’ drafts, field notes and posters of challenges and votes cast during the NGT sessions held at Campuses A and B. All the data was initially analysed independently by the researcher and co-coder who subsequently joined forces to compare and discuss their findings. Both were open to multiple possibilities and mulled over the challenges the participants perceived to be facing as recommended by Cleland (2017:67) during the process of analysis. All the top priorities voted for during the NGT sessions were included during the data analysis and incorporated into the themes. Table 4.3 represents a comprehensive summary of processed data after analysis.

TABLE 4.3 PROCESSED DATA AFTER ANALYSIS[4]

THEMES	CATEGORIES	SUB-CATEGORIES	Responses	Participant
Stakeholders	Finances	Initial cost	“Cost”	A9
			“Lack of finances”	A7;A8;B4
			“Financial resources”	A8
			“Budget”	B5
			””No money to buy”	A4
			“Finance to purchase? Cost per doll/procedures”	B4

[4] All reported responses throughout are verbatim, including grammar and spelling.

THEMES	CATEGORIES	SUB-CATEGORIES	Responses	Participant
			“No high fidelity manikins”	B5
			“Procurement”	A9
			“Money to equip the lab”	A2
		Funding for operational equipment	“Funding”	A3
			”Mannikins will need to be serviced”	A1
			“Manikins will have to be serviced and maintained, this will put a budget constraint to management”	A5
			“Manicins will need to be fixed or serviced”	A8
			“Dolls that we are supposed to work with are not in working order”	A7
			“Servicing”	A9

THEMES	CATEGORIES	SUB-CATEGORIES	Responses	Participant
			“Servicing and resources for the dolls”	A3
			”If there is not money to service manikins students will be taught with uncalibrated manikins which can give or represent a wrong simulation”	A5
			”Contract and follow-up service plans from suppliers lack (maintenance)”	A4
			“Broken equipment not serviced – not repaired”	A9
			”Lack of knowledge on which dolls to purchase”	B4

THEMES	CATEGORIES	SUB-CATEGORIES	Responses	Participant
	Human resources	Employment of staff	”Availability of human resources”	A1
			“Lack of manpower (clinical accompaniment)”	B5
			“Shortage of staff to be preseptors on application”	B4
			“Lack of staff to manage sim labs”	A3
			“Not enough personnel”	A4
		IT support	“Staffing – qualification/competence (technicians)”	A9
			“IT support for operating mannikins”	B2
			”Personnel to manage technology”	A2
			“Technological manicans will be a	A8

THEMES	CATEGORIES	SUB-CATEGORIES	Responses	Participant
			challenge to operate without technician”	
			“Technological challenges”	A9
		Lack of workforce	“Will there be somebody to assist for shortcomings”	A6
			”No one to man simulator room”	A4
			“Personnel managing simulation labs”	A2
	Physical and material resources	Infrastructure and space	”Venues are a big problem”	A2
			“Very small simulation room available in our area”	B2
			“Space where the lab will be situated”	A6
			”Capacity of the lab”	A6
			“Space used in high fidelity simulation”	B1
			“Storage space”	A9

THEMES	CATEGORIES	SUB-CATEGORIES	Responses	Participant
			“Labs limited”	A8
			“Will it be demarcated or not (disturbance)”	A6
			“Rooms are not conducive, good enough, not well ventilated”	A7
			“Infrastructure not condusive – to small”	B4
			“Infrastructure. There are no simulation labs”	B6
		Lack of simulators	”Will they be purchased in time”	A6
			“Will they be enough for all disciplines (service included)”	A6
			“Not enough mannikins, only have one for midwifery”	B2
			“There are only 2 mannikins at the	A5

THEMES	CATEGORIES	SUB-CATEGORIES	Responses	Participant
			campus that can be used, looking at the number of students that is not sufficient, therefore lack of sufficient resources”	
			“Availability of different high fidelity simulators”.	B1
		Loadshedding and availability of electricity	”If there is loadshedding for several months no simulation will be done”	A5
			“How will they be operated in case of power cuts”	A6
			“Back up”	A9
			”Back-up for electricity due to problems of the transformer etc.”	B2

THEMES	CATEGORIES	SUB-CATEGORIES	Responses	Participant
			“Electricity challenge – this is really unreliable in our area”	B3
		Availability of material resources	“Availability of other resources needed in scenarios eg gloves, dressings”	A3
			“Lack of resources...”	B6
			“… no resources”	A7
			“No well-equipped area for simulation”	A4
			“Material and equipment”	A8
			“Lack of resources (materials)”	B6
	Attitudes	Preparation	”Attitude of lecturers towards something they feel pressured in”	A3
			“High uncertainty and lack of support demoralize lecturers”	A3

THEMES	CATEGORIES	SUB-CATEGORIES	Responses	Participant
		Support from management	”Support from management”	A1
			“Lack of support from management and financial offices”	A3
			“No strategy in place about R171 and that increases anxiety for all stakeholders”	A8
			“Buy in from management”	A9
		New method of teaching/learning	”Really a new way of thinking”	A2
			“First time use of high fidelity as a requirement”	A3
			“(Too much) HFS will not make students to perform well at the real situation, therefore students must not spend more	A5

THEMES	CATEGORIES	SUB-CATEGORIES	Responses	Participant
			time on HFS than in clinical areas”	
			“Lack of emotional intelligence in terms of intergrating the traditional way”	A5
			“Some subjects/themes disciplines are abstract; will HFS assist student to gain skills”	A8
			“Not all subjects can use simulator”	A4
Readiness of nurse educators	Nurse educator’s training	Lecturers’ lack of knowledge	”How to operate the high fidelity doll”	B1
			“Skill – the doll that is available needs ample time for	B3

THEMES	CATEGORIES	SUB-CATEGORIES	Responses	Participant
			inservice and mastery of how it works”	
			“Need training of how to operate those manikins – before we can demonstrate for students”	B5
		Preparation of Lecturers	“Poor/no training of lecturers”	A8
			“WIL”	A8
			“Training on use”	A9
			“Training of lecturers to use HFS”	A1
			“Not completely prepared”	A2
			“Need training to operate mannikins”	A4

THEMES	CATEGORIES	SUB-CATEGORIES	Responses	Participant
			"Training of educators with regards to operating simulators"	A6
			"Facilitator of HFS must be well trained, an expert, at the college no training for lecturers has been done"	A5
			"Personnel trained on demonstration of the procedures?"	B4
			"Colleagues need further special training to operate manicans"	A8
		Discomfort in terms of technology	"Are educators well conversant with technology"	A6
			"Nurse educator must keep up-to-date with new technology and	A5

THEMES	CATEGORIES	SUB-CATEGORIES	Responses	Participant
			new way of doing things and have knowledge on latest development, can only do that if at clinical areas more often than students but at college not given an opportunity to work at clinical areas"	
			"Will simulators be user friendly"	A6
			"Will simulators merge the real life"	A6
			"Will simulators be appropriate for the discipline"	A6
		Time Management	"Access (to HFS) eg time tables"	A9
			"Information sessions on how to write	A2

THEMES	CATEGORIES	SUB-CATEGORIES	Responses	Participant
		Drawing up of a simulation programme	scenarios to benefit students”	
			“Alignment of the modules not yet started”	B4
			“Need training of how to operate those manikins – before we can demonstrate for students”	B5
		Correct qualifications	”The process of qualifications – educators are supposed to have Master’s degree when moving to R171”	A6
			“Academic equity”	A9
	Empowerment /autonomy	Time management	“Time management”	A3

THEMES	CATEGORIES	SUB-CATEGORIES	Responses	Participant
			”Time frame to write scenarios for 2020”	A2
			“One day (a week) in simulation room students won’t have enough time to practise”	B2
		Staff self-empowerment	“Technological skills (computer literacy)”	B6
			”Lack of knowledge of capabilities of simulators”	A3
			“Computer literacy – dolls require intense knowledge and computer skill”	B3
	Students Training	Large number of students	“Since there are few manicans present, some students might have little/no time to get exposure”	A8

THEMES	CATEGORIES	SUB-CATEGORIES	Responses	Participant
			"Large number of students"	A9
			"Size of groups too large"	A4
			"Number of student that can be accommodate in rooms for effective learning"	A3
		New programme	"Students not used to this method – preparation of the student"	A2
High Fidelity Simulation	Responsibilities of HFS manager	Management and security of HFS equipment	"Safety (mannekins)"	A9
			"Security – those (mannikins) available are not under lock and key, can easily be stolen"	B3
			Care of mannikins (high fidelity simulators)"	B1

THEMES	CATEGORIES	SUB-CATEGORIES	Responses	Participant
		Authenticity of HFS sessions	”Equipment to manage/manipulate real life situations not available → technology not enough	A2
	Standards of HFS sessions	Lack of a standardised framework	“Testing what is supposed to be tested – same experience for all students”	A9
			“Extent of ‘real life”	A9
		Drawing up of HFS programme	“Standard framework?”	A5
		Computer literacy requirements	“Need training to operate manequins”	A4
	IT Control Center	Control rooms	“No control room for operation”	B1
			“Control rooms – if available soon – training	B4

4.8 Research findings

According to Botma *et al*. (2010:221), the procedure of data analysis incorporates making use and sense of image and text data so as to formulate ideas derived from the collected data. Moreover, the collection, management/synthesis and analysis of data can occur simultaneously (Polit and Beck, 2012:556). Thus the quest for vital themes and concepts is constantly in process from the moment data collection begins.

The aim of this research was to identify challenges facing nurse educators in the implementation of High Fidelity Simulation as a teaching strategy at a public nursing college (NEI). After thorough investigation, the researcher and co-coder identified themes and categories by meticulously investigating the responses listed by the participants. Both sets of findings were very similar with almost identical conclusions being drawn. Van Breda (2005:10) stresses that the more statements occurring on a specific theme, the more important that statement is likely to be. The researcher thus decided to discuss the findings according to the themes and categories identified and set out in Table 4.3 and not necessarily according to priorities, although they also played an important role and votes received were indicated.

Three themes, namely **stakeholders**, **readiness of nurse educators** and **high fidelity simulation,** were formulated from the data and placed in descending order of importance.

The formulae of the three themes which represented the challenges put forward by the participants were processed according to both Tesch's analysis (cited by Creswell, 2014:198) and van Breda (2005:1), as comprehensively described in Chapter 3. This was done in order to present a comprehensive overview of the challenges identified by the nurse educators who took part in the research study.

4.8.1 Theme 1 Stakeholders

Stakeholders in nursing education are defined by Virgolesi *et al.* (2014:559) as “people or organizations with a vested interest or stake in a resource”. This article recognised the most commonly identified nursing education stakeholders involved in the implementation of new educational pedagogy as nurse managers, educators, clinicians and students (Virgolesi *et al.* 2014:559).

Stakeholders have been identified by the participants of this study as playing a considerably important role in challenges they face in implementing HFS. Campus A voted the attitudes of stakeholders as their second highest challenge, with five participants, giving it a total of 15 points (see Table 4.2). Similarly, Campus B’s top priority two and lower represented needs that could only be fulfilled by stakeholders. Support and backing from stakeholders was of paramount importance to the successful implementation and maintenance of an HFS programme. For the purposes of this study, the researcher identified internal and external stakeholders which were crucial in order for successful HFS implementation to occur. Internal stakeholders included management, supply chain and human relations departments, nurse educators, students and local communities of the two campuses. External stakeholders included the National and Free State Departments of Health (NDoH, FSDoH) CHE, SANC and the Free State community. The researcher identified four categories under stakeholders, namely finances, human resources, physical and material resources, and attitudes.

The use of high fidelity simulators in nursing education is costly (Janse van Vuuren *et al.* 2018:1) The participants considered general funding for the entire HFS programme to be an issue of challenge. The financial support and attitudes of key nursing stakeholders is crucial for the implementation of a successful and sustainable

simulation programme. Support is required from financial and other managers to budget and secure finances for adequate laboratory space, equipment, a simulation coordinator, and an information technology support person (Ray, 2017:25).

4.8.1.1 Finances

The successful introduction and implementation of a high fidelity simulation programme requires adequate finances. Finances within the HFS programme centred mainly around the requirements of the nursing students with regard to education pertaining to high quality patient care. Funds were required for suitable environmental space for HFS education, material resources and apposite staffing of the HFS programme.

The challenges identified under finances are initial cost, funding for operational equipment, sufficient finances and maintenance of HFS manikins. The participants voiced concern regarding lack of funding for the required *initial cost* of the HFS programme. Campus A voted it as its third biggest challenge, with four participants, giving it a total of 14 points. Enough finances was Campus B's second highest challenge, with four participants giving this a total of 17 votes. A research study conducted by King (2018:235) mentions lack of funding as a challenge in the implementation of simulation at NEIs. Simulation is a costly undertaking and entails expensive equipment (Qayumi *et al.* 2014:464). The initial **"cost"** [A9] of implementing a simulation laboratory is a very expensive exercise. King (2018:236) echoes that initial costs of HFS amounts to large amounts of money. **"Lack of finances"** [A7; A8; B4;] is considered by participants to be a factor in the initial cost as there are insufficient **"Financial resources"** [A8] to equip simulation laboratories and purchase manikins. There were concerns that currently there is no **"Budget"** [B5] for the purchasing of sufficient HFS manikins, as one participant stated: **"No money to buy"** [A4]. Noteworthy

factors within the challenges faced included the following: Lack of finances with regard to start-up, **"Finance to purchase? Cost per doll/procedures"** [B4]. Other participants were under the impression that their campus currently had "**No high fidelity manikins"** [B5], which would also have an impact on the initial cost.

The participants had already voiced their concern that there was not enough money to purchase sufficient manikins for HFS to be successfully implemented. That concern included funds for essential equipment **"Procurement"** [A9]**,** needed in the operational environment. The participants anticipated that there must be **"Money to equip the lab"** [A2]. Shortage of funds reserved for ensuring that nurse educators and simulation personnel were adequately educated in all aspects of HFS (King, 2018:236) might result in no successful implementation of clinical simulation into the curricula. ***"Funding"*** [A3] for *operational equipment* for the HFS programme appeared to be a further cause for concern. **"Manikins will have to be serviced** [A1; A5] **and maintained, this will put a budget constraint to management"** [A5]**.**

According to participant feedback regarding challenges, there appeared to be insufficient funds to ensure the necessary ongoing maintenance of HFS manikins. **"Manicins will need to be fixed or serviced"** [A8], **"Dolls that we are supposed to work with are not in working order"** [A7] and **"Servicing** [A9; A3] **and resources for the dolls"** [A3] were some of the challenges mentioned. This would have noteworthy bearing upon the challenge of ongoing maintenance of HFS manikins.

It was vital that HFS equipment be timeously repaired and regularly serviced to guarantee continuous quality education. This was demonstrated by the response: **"If there is not money to service manikins... students will be taught with uncalibrated manikins which can give or represent a wrong simulation"** [A5]. The

participants indicated that there should be a **“Contract and follow-up service plans from suppliers”** [A4] in place and that **“Broken equipment not serviced – not repaired”** [A9] is counter-effective when training students.

Costs of simulation undertakings are frequently misjudged and under-researched (Qayumi *et al.* 2014:464). Concern was raised that the “**Lack of knowledge on which dolls to purchase”** [B4] could lead to wasted expenditure. Expense and the need for greater financial assistance is a challenge that needs to be addressed in order for simulation programmes to be successfully implemented (King, 2018:237, Qayumi *et al.* 2014:461, 465). Simulation centres necessitate continuous funding to operate, maintain, repair or replace necessary equipment. Stakeholders needed to budget for human resources equipped with the necessary skills. The acquisition of manpower was also essential for the successful implementation of simulation (Qayumi *et al.* 2014:464).

4.8.1.2 Human resources

The human resources category was divided into four sub-categories, namely employment of staff, IT support, management of security and lack of workforce.

Implementation and facilitation of HFS programme required a sufficient number of staff. *Employment of staff* was deemed to be the tenth most important challenge by participants from Campus A. The **“Availability of human resources”** [A1] and utilisation of highly educated staff is vital within a HFS programme. There is a demand for more nurse educators in all types of nursing programs (Jeffries, 2008:70).

The participants expressed a sense the presence of difficulties pertaining to the employment of staff for HFS programme. Effective staff management means having the right employees and enough of them in the right positions. The participants’

responses indicated that a "**Lack of manpower (clinical accompaniment)" [B5]** and the "**Shortage of staff to be preseptors on application" [B4]**, would hinder quality training of nurses. They also felt that there was a **"Lack of staff to manage sim labs" [A3]** and **"Not enough personnel" [A4]** available for the introduction and implementation of the proposed HFS programme at the NEI.

King (2018:235) identifies lack of funding for committed simulation personnel as one of the reasons why no HFS clinical simulation programme has been introduced at a well-known American university equipped with a dedicated simulation laboratory. Another reason given was the absence of a champion to implement the HFS programme. Technologically, HFS is intricate and needs to be managed and supervised by the correct expertise.

IT support was a further concern among participants, and the responses indicated that **Staffing - qualification / competence (technicians)" [A9]** and **"IT support for operating mannikins" [B2]**, were vital for the successful implementation of HFS at the campuses. The participants were of the opinion that an insufficient number of staff was currently in place to ensure the feasibility of a new HFS programme, that **"Personnel to manage technology" [A2]** was not sufficient. The participants felt that **"Technological manicans will be a challenge to operate without technician" [A8]** for nurse educators. HFS is a new learning and teaching strategy, forcing nurse educators to face and address these **"technological challenges" [A9]**.

A *lack of workforce* of IT and simulation experts existed, which had a negative effect upon the smooth functioning of an HFS programme. The responses that addressed the participants' concerns with this were **"Will there be somebody to assist for**

shortcomings" [A6] and **"No one to man simulator room" [A4]**. The need for "**personnel managing simulation labs" [A2]** was clearly expressed.

Nursing colleges may receive the technological support needed. However, the unfortunate financial state of some nursing schools results in lack of resources and equipment (Jeffries, 2008:71).

4.8.1.3 Physical and material resources

Sufficient space, conducive venues and excellent infrastructure are essential in order for HFS laboratories to function successfully (Qayumi *et al.* 2014:464). The category regarding the challenges facing the HFS programme pertaining to physical and material resources were allocated into four sub-categories according to the feedback from the participants. They were infrastructure and space, lack of simulators, loadshedding and availability of electricity, and lastly, availability of material resources.

Both campuses identified *infrastructure and space* as their fourth biggest challenge, with five participants in Campus A giving it a total score of 13 points and four participants in Campus B giving it a total of 12. Campus B made enough space a separate challenge, with three participants giving it a total of 12, making it priority 5. For purposes of this study, the researcher decided to place infrastructure and space together.

Sufficient space for simulation is a challenge (King, 2018:237), especially when several clinical groups are working on different scenarios at one time. Equipment also needs to be stored (Jeffries, 2008:71). In addition, the type of space assigned for the simulation laboratory is significant as it will be more expensive to renovate a space that is fitted for another purpose than building it from scratch (Seropian & Lavey, 2010:338).

”**Venues are a big problem” [A2] -** The participants considered venues as a notable problem and both simulation laboratory and storage space to be either unavailable, unsuited for the purpose or insufficient in size, **“Very small simulation room available in our area” [B2]**, as evidenced in responses. Uncertainty was expressed in terms of **“Space where the lab will be situated” [A6]**, “**Capacity of the lab” [A6]**, “**Space used in high fidelity simulation” [B1]** and **“Storage space” [A9]**. A participant was concerned that there were too few laboratories, thus **“Labs limited”** [A8], while another participant wondered whether the HFS laboratory **“Will (it) be demarcated or not (disturbance)” [A6]**. The above findings are reaffirmed by Qayumi *et al.* (2014:465) that simulation needs adequate space.

Participants from Campus A stated that **“Rooms are not conducive, good enough,** and **not well ventilated” [A7]**, while those from Campus B indicated that they did not have a designated simulation laboratory **“Infrastructure not condusive – to small” [B4]**. Participant B6 was also of the opinion that **“Infrastructure. There are no simulation labs” [B6]** is a challenge.

Meaningful assessments on the value of simulation in health education cannot be carried out appropriately unless suitable infrastructure is in place. Unfortunately, the infrastructure support of many simulation centres across the world is of a weak standard (Qayumi *et al.* 2014:464,465). *Lack of simulators* compounds this problem.

HFS cannot take place without proper HFS manikins. A participant from Campus A was clearly anxious about the lack of simulators at the campus as can be seen by responses such as **“Will they be purchased in time” [A6]** and **“Will they be enough for all disciplines” [A6]**. Campus B has **“Not enough mannikins, only have one for midwifery” [B2]** while at Campus A **“There are only 2 mannikins at the campus that**

can be used, looking at the number of students that is not sufficient, therefore lack of sufficient resources" [A5]. The effectiveness of HFS as a teaching strategy is dependent on **"Availability of different high fidelity simulators"** [B1]

Loadshedding and availability of electricity can hamper the successful implementation of HFS sessions. In South Africa, electricity loadshedding has become part of everyday life, "**If there is loadshedding for several months no simulation will be done"** [A5]. International literature does not mention electricity loadshedding, beyond indicating that alternative power sources ought to be in place in the event of a power outage. The responses of the participants with regard to loadshedding and availability of electricity for the HFS programme indicated that this was an important challenge faced in their campuses **"How will they be operated in case of power cuts"** [A6]**.** Campus B had the additional challenge of overall poor electricity supply, due to its rural location, **"Back-up** [A9; B2] **for electricity due to problems of the transformer etc."** [B2] and **"Electricity challenge – this is really unreliable in our area"** [B3]**.** In addition to electricity, material resources were also a concern voiced by participants.

Challenges with a*vailability of material resources*, such as **"availability of other resources needed in scenarios eg. gloves, dressings"** [A3], and **"lack of or no resources"** [B6, A7] were identified by participants from both campuses. Jeffries (2008:71) discovered that audio-visual/information technology required to operate the high-fidelity simulators and videotape activities for debriefing are among the material resources needed to initiate and maintain HFS. It is imperative that audio-visual systems are included in the budget and during planning (Seropian & Lavey, 2010:338). Responses such as **"no well-equipped area for simulation"** [A4] and **"material and equipment"** [A8] indicated that these facilities might not yet be in place.

The concern raised by participants regarding physical and material resources related to current challenges with venue, limited and unconducive infrastructure, lack of simulators and "**lack of resources (materials)" [B6]**. Relevant space for venues as well as sound infrastructure and sufficient material resources were necessary in order to be able to introduce and implement a successful HFS programme. Stakeholders played a large role in preparing the way for change leading to development, growth and remaining up-to-date with international trends, in-service training and encouraging personnel to change their attitudes in order to prepare for necessary growth (Janse van Vuuren *et al.* 2018:2; Jansen *et al.* 2009:e12) .

4.8.1.4 Attitudes

Staff attitudes are an important factor in satisfaction and an effective work environment. Positive attitudes are conducive for the effective introduction and implementation of an HFS programme. Protecting long-established education methods and resistance to change leads to barriers to the successful implementation of simulation (Qayumi *et al.* 2014:462). The category regarding attitudes for the HFS programme was divided further into three sub-categories identified from participant feedback. They were preparation, support from management, and new method of teaching/learning.

Preparation plays an important role in defining the attitudes of nurse educators, as they are the main initiators required to introduce HFS to students. In a descriptive study by Adamson (2010:e75), faculty identified, among others, lack of support as a barrier to integrating simulation in nursing courses, and suggested that support from colleagues and administrators would assist with integration of simulation into their courses. The feedback "**attitude of lecturers towards something they feel pressured in" [A3]** and **"High uncertainty and lack of support demoralize**

lecturers"[A3] resonate with Adamson's findings. Simulation necessitates administrative support in addition to funds for various resources (Jeffries, 2008:71; King, 2018:235; Hyland & Hawkins, 2009:20). Nurse educators should be able to attend nursing education symposia and conferences to learn more about simulation and associated research, and to network with other educators using simulation.

Jeffries (2008:71-73) accentuated that nurse educators required encouragement and support in designing and implementing innovations such as simulations. Management needed to be patient and provide extended time for developing and implementing simulations at the workplace, or be prepared to spend money for commercial packages.

S*upport from management* was identified as a crucial aspect for the successful implementation of HFS. The responses from the participants reflected their views of attitudes within their work environment and the possible impact these would exert upon introduction of an HFS programme.

The participants seemed to experience challenges with **"Support from management"** [A1] as could be seen in responses such as **"Lack of support from management and financial offices"** [A3] **"No strategy in place about R171 and that increases anxiety for all stakeholders"** [A8] and **"Buy in from management"** [A9]**.** It appeared that they were experiencing challenges regarding management support. They were unsure about the way forward, what was expected from them in terms of HFS and how to go about introducing HFS into their teaching programmes. There was, however, positive feedback from the participants regarding HFS as a new learning and teaching pedagogy.

This *new method of teaching/learning* would not be without its glitches. **"Really a new way of thinking"** [A2] suggested that the participants were re-evaluating their attitude towards traditional teaching methods and looking towards modifying these, as SANC (2020) officially introduced **"first time use of high fidelity as a requirement"** [A3] According to Jansen *et* al (2009:e11) "if faculty members perceive the obstacles (of utilizing simulation) to be insurmountable, they will not effectively utilize simulation in ways that could enhance student learning".

Another concern raised was **"(too much) HFS will not make students to perform well at the real situation, therefore students must not spend more time on HFS than in clinical areas"** [A5]. This relevant concern has been previously raised internationally. The 2014 National Council of State Boards of Nursing (NCSBN) study has already addressed this, as substitution of up to 50% of traditional clinical time with HFS simulation was found to show no statistically significant differences in reaching outcomes (Alexander *et al.* 2015:41; Doolen *et al.* 2016:291).

The participants perceived the change from the traditional way of teaching to the new learning and teaching strategy as an emotional journey, **"lack of emotional intelligence in terms of intergrating (HFS with) the traditional way"** [A5] indicated that nurse educators needed to look at themselves introspectively, and re-evaluate their attitude towards HFS and new learning and teaching methods.

Certain participants were concerned that **"Some subjects/themes disciplines are abstract; will HFS assist student to gain skills"** [A8], and they were under the impression that **"Not all subjects can use simulator"** [A4]. Nurse educators who have not yet been properly exposed to training of HFS would not be aware of the ability of HFS to be utilized in all disciplines.

4.8.2 Theme 2: Readiness of nurse educators

Nurse educators are often not prepared for advances in nursing education. They are frequently expected to learn to use equipment and computer programme scenarios without any formal training, on their own (Janse van Vuuren *et al.* 2018:5). However, faculty development is vital for simulation programs to succeed (Peterson *et al.* 2017:258). The second theme was the level of the readiness of nurse educators to undertake an HFS programme. Campus A identified readiness of staff as their greatest challenge, with eight participants voting a total of 33 points.

The theme “readiness of nurse educators” was divided into three categories identified by the researcher and co-coder, with supporting responses from participants. The categories were nurse educator’s training, empowerment/autonomy and students training.

4.8.2.1: Nurse educators training

Training of staff was a vital strategy in order to equip staff with necessary skills, a quantifiable level of expertise to support quality training of students in order to assure safety of patients. Nurse educators should consistently be guided in the latest teaching trends to implement best teaching practices (Janse van Vuuren *et al.* 2018:3; King, 2018:236). Staff development and training were essential for the introduction and implementation of a successful HFS programme. The category regarding nurse educators’ training for the HFS programme was further subdivided into six sub-categories according to participants’ feedback. They were as follows: lecturers’ lack of knowledge, preparation of lecturers, discomfort in terms of technology, time management, drawing up of simulation programme and correct qualifications.

The apparent *lecturer's lack of knowledge* in the field of HFS was a source of concern for the participants, who perceived the level of education regarding HFS to be very important and currently inadequate. Six participants from Campus B gave it a total of 25 points, making it their highest priority. The lack of knowledge the participants voiced were basic elements such as "**How to operate the high fidelity doll" [B1]** and further training **"skill[s] – the doll that is available needs ample time for inservice and mastery of how it works" [B3]**. Therefore, they identified the **"need [for] training of how to operate those manikins – before we can demonstrate for students" [B5]**. Participants clearly indicated their need for preparation in the carrying out of HFS implementation before being able to integrate it into their teaching methods with students.

Preparation of lecturers was pivotal in achieving successful implementation of HFS in the new undergraduate nursing curriculum. **"Poor/no training of lecturers" [A8]** appeared to be a major concern with participants. **"WIL" [A8]** or work-integrated learning was identified as a new concept on which participants needed more clarity and guidance. Nurse educators needed **"training on use" [A9]** in the efficient and correct use of HFS equipment as well as the integration of simulation into the nursing curricula in order for the implementation of simulation to be successful at NEIs (King, 2018:237).

Participants voiced reservations with regard to the **"training of lecturers to use HFS"[A1]**, saying that they were **"not completely prepared" [A2,]** and **"need training to operate mannikins" [A4]**. Lack of Instructor training can cause barriers in implementing simulation training (Qayumi *et al.* 2014:461). **"Training of educators with regards to operating simulators" [A6]** would assist in avoiding this from happening. Other responses such as **"facilitator of HFS must be well trained, an expert, at the college no training for lecturers has been done" [A5]**, and **"Personnel trained on**

demonstration of the procedures?" [B4] indicated the need of staff training in order to introduce and implement the HFS programme. Very often nurse educators are not adequately prepared, and must experiment with simulations by trial and error (Jeffries, 2008:71). **"Colleagues need further special training to operate manicans"** [A8] was clearly a concern that needed to be addressed. Technology was relatively new in the world of the South African nurse educator, understandably instilling possible fear of failure in mastering HFS.

Discomfort in terms of technology was suggested by the participants who made a question statement **"Are educators well conversant with technology"** [A6]. Campus A had four participants giving discomfort of technology a total of 12 votes, making it their fifth largest challenge. Campus B echoed that they needed IT support, which they made their third highest priority with 13 votes. According to research, technology can be effective in achieving a variety of teaching and learning needs (Adamson, 2010:e76).

Technology within the nursing field as part of staff competence within the HFS work environment is required in order to ensure staff members' skills and professional development remain in line with technological requirements and advances. However, many faculties are not prepared for the type of teaching that requires them to embrace technology (Jeffries, 2008:70). The discomfort in terms of technology prevented the nurse educators from fully accepting technology. They apprehend the thought that **"Nurse educator must keep up-to-date with new technology and new way of doing things and have knowledge on latest development …"** [A5]. Other participants questioned **"will simulators be user friendly"** [A6] and **"will simulators merge the real life"** [A6]

Nursing faculty are interested in research-based evidence about the effectiveness of simulation (Adamson, 2010:e79). The participants were unsure about the use of manikins and their capabilities for specific disciplines, as illustrated by the response **"will simulators be appropriate for the discipline"** [A6]. Various faculty mistakenly believe that manikin-based simulations can only be applied to acute care settings (Jansen *et al.* 2009:e15).

Concern was voiced by the participants regarding the allocation of HFS training within current *time management* format. This challenge would possibly be an on-going issue as the NEI's current educational timetable allowed all disciplines only one day a week (Wednesdays) to practice simulation. That might prove a challenge to accommodate **"access (to HFS) eg time tables"** [A9]**,** as adequate HFS programme time-frame for both nurse educators and students must be in place.

The contributions from the participants reflected that they were not confident that they have the level of knowledge required in the *drawing up of a simulation programme*. They requested **"Information sessions on how to write scenarios to benefit students"** [A2] and stated that they did not feel comfortable with the current situation of "**alignment of the modules not yet started"** [B4]. Once again **"Need training of how to operate those manikins – before we can demonstrate for students"** [B5] indicated that it was very important for participants to be and feel competent in presenting HFS scenarios.

Educational programmes focus upon the need to ensure *correct qualifications* for the relevant discipline. As already discussed in chapter two, the new undergraduate nursing curriculum has been geared to moving nursing training to higher education. Included herein is the expectation that nurse educators improve their qualifications by obtaining a Master's degree, as reflected in the response "**the process of**

qualifications – educators are supposed to have Master's degree when moving to R171" [A6]. The issue of feasibility of access to HFS education within current commitments of duty as well as the process of qualification in order to ensure **"academic equity"** [A9] appeared to be of concern to the participants.

4.8.2.2: Empowerment / autonomy

A positive work environment would allow nurse educators to render HFS education with empowerment and autonomy (Wei *et al.* 2018:287). This would indicate that HFS education would be rendered over a period of time by nurse educators with specific skill-sets and sufficient time in hand to facilitate educational classes.

The category regarding the empowerment and autonomy for the HFS programme was further subdivided into three sub-categories according to the feedback from the participants. They were as follows: time management, staff self-empowerment and exposure to clinical setting.

"Time management" [A3] is a key aspect in the successful introduction of any new learning and teaching strategy, a vital skill needed to be acquired and practised by educators. Sufficient time needed to be made available to enable educators to have, among others, an adequate **"time frame to write scenarios for 2020"** [A2] in order to prepare themselves to implement HFS successfully. Educators were concerned that the WIL-based timetable with only **"one day (a week) in simulation room would mean that students won't have enough time to practise"** [B2], indicating a need for faculty to empower themselves with understanding of simulation and how it can be utilised effectively within a given short period of time.

The ability to create a professional HFS programme with the confidence which emanates from competence calls for *staff self-empowerment* to possess

comprehensive knowledge and up-to-date **"technological skills (computer literacy)"** [B6].

The general opinion of participants, which included **"lack of knowledge of capabilities of simulators"** [A3] and **"computer literacy – dolls require intense knowledge and computer skill"** [B3] suggested that insufficient knowledge regarding these existed within present structures. Once these responses have been mastered, the educators would be equipped to operate autonomously.

4.8.2.3: Students training

According to Jeffries (2008:71) "Educators need new skill sets to develop student-centred teaching techniques whereby learners are immersed in simulated clinical environments in which they solve and make decisions" (King, 2018:243; Munangatire *et al.* 2019:4,8). Students required education from the NEI in order to function with competence and safety within the field.

The category regarding the challenges facing the HFS programme with regard to students was allocated into two sub-categories according to the feedback from the participants. They were as follows: large number of students and a new programme.

The *large number of students* was one of the challenges identified by the participants for providing quality HFS education. The participants were still concerned **"since there are few manicans present, some students might have little/no time to get exposure"** [A8]. The size of the facilities for simulation should grow in relation to the increasing number of students (Qayumi *et al. 2014:462).* The **"large number of students"** [A9; A4] and the "**number of student that can be accommodate[d] in rooms for effective learning"** [A3] were issues that needed to be addressed.

Participants felt that challenges facing them with the introduction of the new curricula in 2020 included the introduction of HFS as a *new programme*. The participants'

concern was that **"Students [are] not used to this method – [effective] preparation of the student[s]"** [A2] and therefore have to adapt to this new way of learning and teaching. Once nurse educators were appropriately trained and able to function autonomously with confidence, they would embrace change and accept HFS as a learning approach, thereby ensuring its successful implementation.

4.8.3 Theme 3: High fidelity simulation

The third theme was High Fidelity Simulation, which is affected by multiple factors such as management, standards and support. It is the norm for high fidelity simulation to occur in a controlled and education-intensive background within a professional organisation (Jansen *et al.* 2009:e13, e15; Hyland & Hawkins, 2009:14). Any weakness within the educational chain might lead to compromise of student training with possible negative resultant impact upon quality patient care.

The theme "high fidelity simulation" was divided into three sub-categories with supporting responses from participants. The sub-categories were: responsibilities of HFS manager, standards of HFS sessions and IT support.

4.8.3.1: Responsibilities of HFS managers

Responsibilities of HFS managers were divided into management and security of HFS equipment and authenticity of HFS sessions. From the participants' responses it appeared that *management and security of HFS equipment*, especially the **safety [of the] (mannekins)"** [A9]*,* and the **"Security – those (mannikins) available are not under lock and key, can easily be stolen"** [B3] was another major cause of concern. Thus, the protection of equipment is a key responsibility of any manager. The maintenance and **"care of mannikins (high fidelity simulators**)**"** [B1] was vital, as damaged or stolen manikins would negatively influence the success and genuineness

of HFS sessions. The achievement of realistic HFS scenarios is another purpose that the HFS manager must strive towards.

The response of the participants with regard to the *authenticity of HFS sessions*, **”equipment to manage/manipulate real life situations not available → technology not enough” [A2]** reflected their concern that they perceived not to have appropriately equipped simulation laboratories and manikins to implement HFS effectively. However, it highlights that they find authenticity in simulation scenarios to be pivotal (Au *et al.* 2016:16-17).

4.8.3.2: Standards of HFS sessions

High standards with regard to knowledge, competence and administration are the norm within the nursing professional context. The development of a high-fidelity simulation programme within a nursing educational setting is enhanced by set high standards (King, 2018:241). This category was further divided into lack of standardised framework, feasibility of drawing up HFS programme and computer literacy requirements.

The *lack of* a *standardised framework* hampered the introduction and implementation of any new learning and teaching method. The response **“Testing what is supposed to be tested – same experience for all students” [A9]** indicated that participants perceived the need for a set standard to guide nurse educators regarding scenario educational requirement uniformity within high-fidelity simulation scenario demonstrations. The participants viewed the absence of a standardised framework at the NEI with regard to simulation **“extent of ‘real life’” [A9]** on good quantifiable outcomes, as well as enabling the high-fidelity scenario to reflect reality as closely as possible, as a concern.

The *feasibility of drawing up HFS programme* was clearly substantiated by the response **"Standard framework?"** [A5], indicating the participants' need for such a programme. A consistent set of high-fidelity simulation standards would ensure all students would receive equal simulatory education. Moreover, set standards of best practice such as the one espoused by the International Nurses Association for Clinical Simulation and Learning, the "Standards of best practice: Simulation" of 2016 offers a stable and equable framework for the establishment a high-fidelity simulation programme (King, 2018:237). In order for the programme to be successfully drawn up, nurse educators needed to be skilled or at least comfortable and competent with the computers utilised in the functioning of manikins and the presentation of HFS scenarios.

The shortage of sufficient *computer literacy requirements* among the participants is alluded to repeatedly throughout the study, as reflected in the response **"? Need [for] training to operate manequins"** [A4] The training and assistance of nurse educators in the operating of the manikins would form part of the HFS manager's responsibilities, together with the assistance of the IT support team operating the IT centre.

4.8.3.3: IT control centre

Campus B identified IT support as their third highest challenge, with five participants giving it a total of 13 points. Fully equipped and functional *control rooms* were essential in the successful implementation of HFS. **"No control room for operation"** [B1], was a cause for concern among the participants. Seropian and Lavey (2010:342), established that the "control room is a unique environment that allows the instructor and operator to observe (see and hear) and control a simulation". The operator and control room occupant must be able to see what is happening with enough detail to

allow for proper operation of the simulation and "must be able to gather sufficient meaningful and accurate data (information) to use as part of the education process post scenario", during debriefing (Seropian & Lavey, 2010:342). **"Control rooms – if available soon – training" [B4],** indicated that participants recognised the need for training therein as a further challenge.

4.9 Discussion

NGT data from fifteen nurse educators was collected to determine what challenges they perceived to be facing them in the implementation of HFS at their public NEI. The range of ages of participants from Campus A was greater than that of Campus B, which might have contributed to the challenge number one identified by participants of Campus B as being educators' lack of knowledge in respect of technology. The findings of this study revealed these challenges clearly, confirming that the research question was effective in achieving what it had set out to discover. Interestingly enough, the responses from the groups held at the two campuses were very similar. These findings also compared favourably with the literature. Although the successful implementation of the mammoth task of HFS at NEIs is not an unachievable undertaking, it does require the total backing, dedication, commitment, belief, confidence, conviction and corroboration of all ***stakeholders*** involved.

Simulation can be a *financial* burden (Laure *et al.* 2015:132), with the initial cost for equipment a disadvantage (Bilotta *et al.* 2013:4) that stakeholders need to take cognisance of. According to Adamson (2010:e79), "the initial investment in simulation requires a commitment to further maintaining that investment through maintenance, training and support".

In an international survey on the position of simulation in health care education, Qayumi *et al.* (2014:457,464) found that the lack of a sustainable business model and adequate financial support for, among others, budget, manpower and infrastructure, caused the integration of simulation into health education to be slowed down.

Lack of significant financial backing led to insufficient infrastructure support, research productivity, curricular integration and use of simulation technology in many of the simulation centres surveyed. These challenges stand in the way of simulation successfully being initiated into other vital areas, such as patient safety, advocacy, professionalism and faculty development (King, 2018:235; Qayumi *et al.* 2014:465). The NDoH's Strategic plan for Nurse Education, Training and Practice 2012/13 – 2016/17 recommended that an adequate supply and the best use of resources which include skilled human resources must be included as a critical factor for success (Strategic Plan for Nurse Education, Training and Practice 2012/13 – 2016/17:114)

Human resources is one of the most important elements in nursing education. Human resources was a concern raised, including lack of personnel to work in the HFS laboratories, manage simulation, IT support, and qualified competent personnel to manage the simulation centre. According to the aforementioned NDoH's Strategic Plan (2013:31), approximately 80% of South African professional registered nurses are trained at nursing colleges, so the availability of human resources at these NEI's is crucial. Another concern raised by the Strategic Plan (2013:22) was the increase in the attrition rate of nurses retiring or leaving the health services or the country. In HFS, not only nurse educators but also IT specialists are required to make HFS succeed. Scerbo (2016:234) states that change is inevitable, and that technology changes are increasing and will have profound effects on health care and patient care.

Physical and material resources represented an immense requirement. Infrastructure is needed and shortage of resources e.g. venues, space, simulators and material supplies were identified. Loadshedding and the availability of electricity were also cited as a cause for concern. The audit done by the NDoH mentioned in the Strategic Plan (2013:22) identified delivery challenges which included infrastructure and resource shortages. Lazzara *et al.* (2014:21) identified eight factors critical for implementing a successful simulation programme which included science, staff, space, supplies, systems, support, success and sustainability. This mirrored what emerged from the data.

Staff needed to be prepared and receive enough support from management in order to accomplish the successful introduction of HFS as a new method of learning and teaching. This should favourably influence their attitudes. The stance of the personnel on HFS should be positive and adequate training should be in place. In a study by King (2018:243), qualitative data from a survey among nurse educators on barriers to simulation led to the identification of *Training* as an important requirement for a successful simulation programme. This entailed studying to use the technology as well as designing and running scenarios, which takes time, and faculty were not allowed additional time to do this (Adamson, 2010:e77,e79). Time was a big concern for the nurse educators who needed to acquire these skills while still continuing with their already heavy workload. Nurse Educators wanted to be appropriately taught and enlightened on HFS, on what the programme meant to them as well as to their students. Training must include self-empowerment in the technological management of manikins, writing and executing scenarios and integrating HFS into the discipline taught by them.

Nurse educators indicated the need to receive *empowerment* to seize HFS and familiarise themselves with all its intricacies. Optimal training and preparation of these educators with the necessary time and opportunities to master HFS before introduction and presentation in the classroom is of paramount importance.

In a study by Munangatire *et al*. (2019:9), it was found that learning was negatively affected by students who perceived themselves and their educators to be lacking in skills to operate high fidelity simulators. Students need to perceive their educators as proficient and capable of presenting HFS effectively so that they might gain trust in this new method of learning and teaching and be reassured of its ultimate success. A proficient educator is required to manage the complexity of all aspects of simulation and have simulation education which will help students to achieve their learning objectives. Educators must be able to adjust the simulation to meet the learning objects based on the students' actions or lack thereof, thereby helping them with decision making, foster skill development, clinical judgement and reasoning (Boese *et al.* 2013:S22; Tanner 2006:204). Nurse educators are settled in their ways of traditional teaching methods and managing large classes. Students are not accustomed to HFS and large number of students might cause nurse educators to become anxious and unsure on how to utilize HFS in their programmes.

Faculty members may be suspicious of using simulator models versus traditional teaching methods (Helyer & Dickens, 2016:143). Lack of suitable equipment and support (King, 2018:240; Adamson, 2010:e75) compounds their scepticism and hampers the integration of simulation into nurse educators' teaching courses. Both instructor training and a dedicated simulation technician are needed (Qayumi *et al.* 2014:461) in order to execute HFS successfully.

Technology was found to be lacking in order to make HFS sessions more real. There appeared to be no appropriate security in place at the existing HFS locations, making participants concerned about the safety of the equipment. There was a need for an overarching HFS manager on duty exclusively for the successful running of the simulation centre. This manager needed to oversee and guarantee the *highest standards of HFS* sessions, constant availability *of IT support* and the smooth running of the simulation laboratory, including timetable and bookings (Janse van Vuuren *et al.* 2018:4).

The dual responsibilities of the HFS manager together with nurse educators included authenticity of HFS sessions and management of the manikins.

4.10 Conclusion

In this chapter the demographic information and data analysis process was discussed in detail and a comprehensive explanation of the findings was provided. The data was analysed in order to project a true reflection of, and insight into, the challenges nurse educators perceived to be facing with regards to the implementation of HFS at a public nursing college.

In chapter five the researcher concludes the findings and offers recommendations on the way forward in addressing these challenges identified by the research study.

CHAPTER 5: CONCLUSION, RECOMMENDATIONS AND LIMITATIONS

"Our reliance on the validity of a scientific conclusion depends ultimately on a judgement of coherence, and as there can exist no strict criterion for coherence, our judgement of it must always remain a qualitative, non-formal, tacit, personal judgement".

Michael Polyani

5.1 Introduction

Chapter four described the challenges nurse educators perceived to be facing with regard to the implementation of HFS at a public nursing college. The responsibility of the nurse educator is to enhance basic skills and make students more robust in terms of the stresses and strains they will encounter professionally, particularly in clinical settings. Until now, nursing students have been exposed to hands-on training tools, for example, low- and medium fidelity technology.

It has become necessary to introduce high fidelity simulation in order that nursing education should be aligned with the recent SANC and CHE requirement developments. To summarise, simulation-based training serves to develop the clinical performance of the students as well as their assessing and managing situations in clinical placements (Hustad *et al.* 2019:53). This learning and teaching strategy is used to sensitise students to the actual working environment they will be face and is therefore imperative in enhancing a nurse's clinical skills and practices. Nurse educators must be able to draw up simulation programmes and prepare and develop HFS scenarios and standardised clinical guidelines that enable students to facilitate their studies. These guidelines should be enhanced with notes that students can employ along with their own notes for future revision and reference and which will

prove to be of great use to them in professional practice as registered nurses. A well-equipped, ideally staffed smooth running high fidelity simulation centre is essential for the successful implementation of HFS in institutions. In chapter 5 the conclusion, main recommendations, limitations and value of the study are debated.

5.2 Conclusion to the study

The new undergraduate nursing curriculum included simulation-based education. The aim of this study was to describe the challenges nurse educators perceived to be facing with regard to the implementation of HFS, which was achieved. It is envisaged that the findings of this study will assist the public nursing college in the introduction of HFS at its campuses.

In these times of rapidly advancing technology it is important to the sustenance, growth and development of nursing education that HFS be successfully implemented at NEIs. In keeping with the constructivism worldview it is every nurse educator's obligation to ensure that NEIs remain updated and abreast of current international trends in the vanguard of nursing education developments.

For the purposes of this study, the researcher investigated and described the challenges nurse educators perceived to be standing in the way of their successfully implementing HFS at the public nursing college where they are employed. The study was conducted on a small scale within two campuses of one public nursing college, but the literature researched demonstrated that most of the challenges are similar or identical to those experienced worldwide (Janse van Vuuren *et al.* 2018:18; King, 2018:235; Qayumi *et al.* 2014:465; Hyland & Hawkins, 2009:20). The results indicate that the involvement and support of *stakeholders* through financial support of HFS,

employment of adequate and qualified human resources, availability of physical and material resources and positive attitudes will contribute to the successful implementation of HFS. Further training and preparation of *nurse educators* will assist them by building up their confidence and *readiness* to execute HFS as a new learning and teaching strategy. Once this is achieved, *HFS* can be initiated with a fully-functional control centre, specialised IT assistance, standardised HFS framework in place, under the supervision of a HFS manager. Themes identified during data analysis in Chapter 4 may briefly be summarised as follows:

- Stakeholders in education comprise everyone concerned in the welfare and success of the school and its students, including administrators, educators, students, parents, families, communities, and governing bodies. All should have a vested interest in, and concern for, their final product, in this case training of a professional nurse who will be capable of rendering quality patient and community care. Functions of stakeholders include provision of adequate finance required for initiating and sustaining HFS with the necessary operational equipment.

  In nursing education, nurse educators as a human resource are accepted as comprising the most important stakeholders. Nurse educators must be involved during profound changes in the curricula and the implementation of new educational approaches such as that of HFS since they are essential to ensure the successful facilitation of student nurses in order to deliver confident and competent professional nurses. Nurse educators with the correct qualifications and knowledge of simulation-based education are needed in order to ensure effective practical training in HFS. A need was also discerned for additional human resources such as an IT specialist experienced in simulation-based

education capable of providing adequate support to nurse educators in rendering quality clinical education. There must be a secure source of electricity available at all times to ensure that HFS practical experiences are not interrupted and continue to take place even when electricity supply is disrupted.

Physical and material resources play a crucial role in contributing directly and indirectly to the achievement of HFS. The need for adequate infrastructure and space at the different campuses is essential. The absence of material resources such as equipment found in clinical practice was also concern.

Personal or institutional attitudes may range between from actively supporting HFS to actively opposing it. The participants prefer a “buy-in” stance from management to support them in the new method of learning and teaching. They do not want to feel pressurised into implementing HFS.

In order to bring foundational knowledge and experience into the science of nursing, nurse educators should be well educated and knowledgeable about HFS, and possess good communication skills. The participants requested further training in this new method of learning and teaching. Nurse educators well trained in HFS may be suitably prepared to create an environment that facilitates student learning and the achievement of desired cognitive, affective and psychomotor outcomes (Spies, 2016:xi). Discomfort in terms of technology may impede quality training. To run HFS effectively, a comprehensive simulation programme needs to be compiled and synchronized with the timetables of different year groups.

- The participants need to have the competence and confidence to make nursing education decisions in accordance with the NEI’s standards of procedure policies, standards and policies that will ultimately help them to implement HFS.

The size of student groups remains a source of concern for the participants who still need to discover suitable solutions to overcome this constraint. Students also need to be successfully prepared to embrace this new method of learning and teaching.

- HFS equipment is very expensive and security and care of the manikins is a major concern. The learning sessions need to be a realistic portrayal of the clinical setting. These sessions must be planned and executed according to a standardised framework which the nurse educator must be trained in and become familiar with. HFS requires a control centre from which all sessions will be co-ordinated.

5.3 Recommendations

Recommendations will be discussed under the context of stakeholders, readiness of nurse educators and high fidelity simulation.

5.3.1 Stakeholders

The NDoH needs to fund HFS as a new learning and teaching strategy. The concerned stakeholders listed above (5.2) must be coordinated and facilitated to plan and budget for the initial cost for infrastructure, operational equipment, material resources, and generators. Simulation centre must be planned and designed by experts in the field with an eye to maximum practicality and effectivity. All campuses need to have adequate manikins and material resources to fulfil their requirements. It is vital to have an adequate annual budget to cover running costs of HFS in order that high standards may be maintained throughout training and so that NEIs may begin implementing HFS with the complete requirements in place. NDoH must regularly facilitate communication by means of meetings, minutes, e-mails and other, between role-

players / stakeholders to keep all concerned up-to-date with the latest events and developments. These measures will minimise frustration and lack of support and participation among all stakeholders.

Human resources, being one of the greatest expenses, should be carefully managed by the human resources department. Highly skilled personnel with the required qualifications (IT, simulation centre manager and co-ordinator) must be appointed to the positions for which they are qualified. Sufficient staff must be employed to ensure that the simulation centre may have its own dedicated staff to ensure quality simulation-based education. There must be sufficient nurse educators in all relevant speciality fields.

As stakeholders, nurse educators need to be consulted in advance of the intention to introduce HFS into their NEI. Their inputs are valuable and their involvement is crucial in forming a positive relationship and taking charge of the HFS teaching strategy. Nurse educators should be timeously invited by management and other stakeholders to share ownership of the new undergraduate nursing curriculum which includes HFS. Regular meetings should be instituted by management to give information and be kept up-to-date with new developments. The NEI must develop and execute a preparation plan for its nurse educators. This plan should include training on the holistic introduction and successful sustenance of HFS. Relevant experts should be invited to give training at the NEI itself so that nurse educators may see and experience how the simulation centre should be run in their own environment and programme, as they need to feel sufficiently competent and proficient to be able to present HFS sessions within their particular field of speciality.

5.3.2 Readiness of nurse educators

The principal of the public nursing college should facilitate a mind shift from traditional methods of teaching to accepting and supporting simulation-based (HFS) learning and teaching as a new pedagogy among the nurse educators. All nurse educators should receive appropriate formal training on implementation of HFS before integrating it into their learning and teaching programme. A plan needs to be drawn up with the input of all the nurse educators with regard to the schedule and sequence of training, so as to prepare them appropriately for the implementation of HFS and WIL.

Time should be allocated to nurse educators for drawing up of their scenarios. Experts from other NEIs should be invited to support and train nurse educators with this and other concerns such as time management and how to deal with successfully with large groups of students successfully. In-service training must be continuously offered throughout. Nurse educators should be introduced to inter-departmental and inter-disciplinary groups where HFS scenarios are brainstormed in unison in order that all disciplines of the healthcare team may benefit.

HFS networking should occur between various HFS champions and nurse educators with an interest in HFS from each campus, and they should be sent on conferences, seminars and workshops. The HFS champions should be employed full-time in the HFS centres, training their colleagues, working out the timetables and assisting nurse educators with the implementation of HFS scenarios in their programmes.

The HFS sector also has plans and scenarios that are shared online and which are considered very helpful and cost-effective.

Nurse educators need to take responsibility for their own continuing professional growth and development, and remain abreast of developments during their working

lifetime by attending private basic skills in computer technology classes for example the international ICDL (international computer driver's licence) course offered after hours at many FETs. This will arm them with the basic technological skills they will require in order to understand how IT works and build on their HFS skills.

5.3.3 High fidelity simulation

The NDoH must fund the services of a HFS manager to take responsibility of the simulation centre. Simulation centres infrastructure needs to be in place, fully equipped and staffed before HFS is implemented. An IT expert needs to be employed at the simulation centre and could be sent to other NEIs were HFS is already practised for training to ensure that the control centre is efficiently and effectively run.

5.4 Value of the study

The value of this master's study has assisted in identifying the challenges nurse educators perceive to be facing with regard to the implementation of HFS at a public nursing college. By providing the nurse educators with the opportunity to voice the challenges they perceived as facing them, this study has served to create the opportunity for these challenges to be noted and recognised so that they may be addressed, and pave the way for the smooth implementation of high fidelity simulation. This study will also contribute to the researcher's master's degree in nursing study, while the concluding findings will have the potential to appear as an article in an accredited scientific journal and be presented at conferences at home and abroad.

5.5 Limitations of the study

Nurse educators unavailable to attend the nominal group discussions, particularly at the last minute, was an unfortunate stumbling block experienced during the research

process at Campus C. Nurse educators who had indicated that they would be available to participate were otherwise engaged on the day and time of data collection agreed upon. Regrettably time and human resources were constrained, thus preventing possible rescheduling of data collection.

Research took place only among nurse educators who gave informed consent and their responses and opinions may differ from those who refrained from participating.

Only nurse educators were included in the study. Management and other personnel employed at the NEI were excluded as it was assumed that these categories of staff would experience different challenges in the implementation of HFS compared to the nurse educators, on whom the actual research was based.

Since this research only took place at the sole Free State public nursing college, its findings and conclusions cannot be transferred and directly applied to public colleges in other provinces of South Africa.

5.6 Recommendations for future studies

This study proposes two recommendations with respect to further study research in identifying potential challenges facing the implementation of a high fidelity simulation programme within a public nursing college. First, to expand the study to include all other categories of personnel working at the NEI concerned directly and indirectly with the implementation and sustained operation of HFS. Second, to include public nursing colleges in other provinces of South Africa in the study.

5.7 Personal reflection

The researcher is a nurse educator at the NEI used for this study. As a young student, the researcher experienced the simulation laboratory as a safe and secure place to practise and learn procedures, improving confidence and skill before finally facing the responsible and daunting task of performing clinical procedures on real-life patients. The researcher has always believed in simulation and its many attributes, patient safety being the top priority. In 2017, on an overseas visit to family, the researcher decided to travel to Buckinghamshire New University (Bucks) HFS facilities located at the School of Nursing and Allied Health Campus in Uxbridge, United Kingdom, in an effort to experience personally the atmosphere and attitudes of students and nurse educators at a top simulation centre. The researcher was warmly welcomed and given an informal tour of the 4 storey state-of-the-art nursing and allied health simulation centre. This life-changing experience convinced the researcher of the benefits an effective and successfully implemented HFS programme has for the nurse student, the nurse educator and most importantly for the patients and their families. This encounter inspired the researcher to embark on this study and make all efforts necessary to ensure its effectiveness.

The challenges raised by the participants of this research were likewise recognised by the researcher who endeavoured, in keeping with the rules laid down by the literature guiding this study, to refrain from employing any form of personal thought by way of preconceived notions or conscious bias in the treatment of the facts as presented by the participants.

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Appendix 1

University of the Free State Ethical Clearance

UNIVERSITY OF THE FREE STATE
UNIVERSITEIT VAN DIE VRYSTAAT
YUNIVESITHI YA FREISTATA

UFS·UV
HEALTH SCIENCES
GESONDHEIDSWETENSKAPPE

Health Sciences Research Ethics Committee

09-Sep-2019

Dear **Mrs Jacinta Kapp**

Ethics Clearance: **Challenges facing nurse educators in the implementation of High Fidelity Simulation at a public nursing college**

Principal Investigator: **Mrs Jacinta Kapp**

Department: **School of Nursing Department (Bloemfontein Campus)**

APPLICATION APPROVED

Please ensure that you read the whole document

With reference to your application for ethical clearance with the Faculty of Health Sciences, I am pleased to inform you on behalf of the Health Sciences Research Ethics Committee that you have been granted ethical clearance for your project.

Your ethical clearance number, to be used in all correspondence is:**UFS-HSD2019/1528/0110**

The ethical clearance number is valid for research conducted for one year from issuance. Should you require more time to complete this research, please apply for an extension.

We request that any changes that may take place during the course of your research project be submitted to the HSREC for approval to ensure we are kept up to date with your progress and any ethical implications that may arise. This includes any serious adverse events and/or termination of the study.

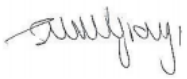
A progress report should be submitted within one year of approval, and annually for long term studies. A final report should be submitted at the completion of the study.

The HSREC functions in compliance with, but not limited to, the following documents and guidelines: The SA National Health Act. No. 61 of 2003; Ethics in Health Research: Principles, Structures and Processes (2015); SA GCP(2006); Declaration of Helsinki; The Belmont Report; The US Office of Human Research Protections 45 CFR 461 (for non-exempt research with human participants conducted or supported by the US Department of Health and Human Services- (HHS), 21 CFR 50, 21 CFR 56; CIOMS; ICH-GCP-E6 Sections 1-4; The International Conference on Harmonization and Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH Tripartite), Guidelines of the SA Medicines Control Council as well as Laws and Regulations with regard to the Control of Medicines, Constitution of the HSREC of the Faculty of Health Sciences.

For any questions or concerns, please feel free to contact HSREC Administration: 051-4017794/5 or email EthicsFHS@ufs.ac.za.

Thank you for submitting this proposal for ethical clearance and we wish you every success with your research.

Yours Sincerely



Dr. SM Le Grange
Chair : Health Sciences Research Ethics Committee

Health Sciences Research Ethics Committee
Office of the Dean: Health Sciences
T: +27 (0)51 401 7795/7794 | E: ethicsfhs@ufs.ac.za
IRB 00006240; REC 230408-011; IORG0005187; FWA00012784
Block D, Dean's Division, Room D104 | P.O. Box/Posbus 339 (Internal Post Box G40) | Bloemfontein 9300 | South Africa

Appendix 2

Letter requesting permission from Head of Department of the Free State Department of Health

P.O. Box 1872
KROONSTAD
9500
01 May 2019

The Head of Department
Free State Department of Health
Bophelo House
BLOEMFONTEIN
9301

Dear Dr Motau

REQUEST FOR PERMISSION TO USE DEPARTMENT OF HEALTH FACILITY FOR MASTER'S RESEARCH: CHALLENGES FACING NURSE EDUCATORS IN THE IMPLEMENTATION OF HIGH FIDELITY SIMULATION AT A PUBLIC NURSING COLLEGE

I am currently working on a master's degree at the University of the Free State, and have selected the above title for my dissertation. I would like to ask your kind permission in your capacity as Head of Free State Department of Health to use the Free State School of Nursing North, South and East Campuses belonging to the Department for my research.

SANC has indicated that 20% of practical hours are to be spent in simulation in the proposed R171 professional nurse diploma course awaiting release for implementation in 2020. I have chosen to conduct this study at FSSoN as northern campus has a fully-equipped high fidelity simulation laboratory in place, and the other two campuses have a HFS maternity mannekin each, giving them access to HFS too.

I am in the process of completing the proposal, after which it will be presented to the University of the Free State Ethics Committee for ethical clearance and permission to continue. Once this permission has been obtained and an ethical clearance number has been assigned to me, I shall be able to complete the necessary documentation

required by your department for permission and approval to use this institution and its personnel for the study.

My research will include resourcing an experienced, qualified nominal group technique facilitator to facilitate a nominal group technique session. It is proposed that the participants of my research will include all nurse educators involved in demonstrating, facilitating and assessing nursing students' training and skills. This session is planned to take place in the campus boardroom on a morning that will be convenient to the campus, and after informed consent has been obtained from all involved. It will have no impact on the institution or its personnel and will be of no cost to the institution.

It is my belief that this study will prove to be effective in identifying challenges facing the personnel with regard to the implementation of high fidelity simulation as well as possible recommendations, thereby contributing to ensuring the smooth introduction of high fidelity simulation at the Free State School of Nursing campuses. Moreover, it is posited that this study will be of value to other campuses into which high fidelity simulation may likewise be introduced in the foreseeable future.

I shall be grateful if you will look favourably on my request and look forward to your reply.

Yours faithfully

J.M. Kapp
Master's student: University of the Free State

Appendix 3

Free State Provincial Department of Health Approval

health
Department of Health
FREE STATE PROVINCE

04 October 2019

Mrs. J Kapp
Dept. of School of Nursing
UFS

Dear Mrs. J Kapp

Subject: Challenges facing nurse educators in the implementation of high fidelity simulation at a public nursing college.

- Please ensure that you read the whole document, Permission is hereby granted for the above – mentioned research on the following conditions:
- Participation in the study must be voluntary.
- A written consent by each participant must be obtained.
- Serious Adverse events to be reported to the Free State department of health and/ or termination of the study
- Ascertain that your data collection exercise neither interferes with the day to day running of **Free State School of Nursing (Eastern, Southern and Northern Campus)** nor the performance of duties by the respondents or health care workers.
- Confidentiality of information will be ensured and please do not obtain information regarding the identity of the participants.
- **Research results and a complete report should be made available to the Free State Department of Health on completion of the study (a hard copy plus a soft copy).**
- Progress report must be presented not later than one year after approval of the project to the Ethics Committee of the University of Free State and to Free State Department of Health.
- Any amendments, extension or other modifications to the protocol or investigators must be submitted to the Ethics Committee of the University of Free State and to Free State Department of Health.
- **Conditions stated in your Ethical Approval letter should be adhered to and a final copy of the Ethics Clearance Certificate should be submitted to** sebeelats@fshealth.gov.za /makenamr@fshealth.gov.za **before you commence with the study**
- No financial liability will be placed on the Free State Department of Health
- Please discuss your study with the institution manager/CEOs on commencement for logistical arrangements
- Department of Health to be fully indemnified from any harm that participants and staff experiences in the study
- Researchers will be required to enter in to a formal agreement with the Free State department of health regulating and formalizing the research relationship (document will follow)
- **As part of feedback you will be required to present your study findings/results at the Free State Provincial health research day**

Trust you find the above in order.
Kind Regards

Dr D Motau
HEAD: HEALTH
Date: 7/10/19

Head : Health
PO Box 227, Bloemfotein, 9300
4th Floor, Executive Suite, Bophelo House, cnr Maitland and, Harvey Road, Bloemfotein
Tel: (051) 408 1646 Fax: (051) 408 1556 e-mail:khusemi@fshealth.gov.za@fshealth.gov.za/chikobvup@fshealth.gov.za
www.fs.gov.za

health
Department of Health
FREE STATE PROVINCE

04 October 2019

Mrs. J Kapp
Dept. of School of Nursing
UFS

Dear Mrs. J Kapp

Subject: Challenges facing nurse educators in the implementation of high fidelity simulation at a public nursing college.

Please find below the contact details for logistical arrangements.

Free State School of Nursing (South Campus)	
Name: Ms NMM Ralikonyana **Email**: ralikonynmm@fshealth.gov.za **Tel**: 051 403 9886/ 051 448 8052	PA: Janette Email: erasmusj@fshealth.gov.za

Trust you find the above in order.

Kind Regards

Head : Health
PO Box 227, Bloemfotein, 9300
4th Floor, Executive Suite, Bophelo House, cnr Maitland and, Harvey Road, Bloemfotein
Tel: (051) 408 1646 Fax: (051) 408 1556 e-mail:khusemj@fshealth.gov.za@fshealth.gov.zachikobvup@fshealth.gov.za
www.fs.gov.za

Appendix 4

Request for permission from principal and deans

P.O. Box 1872
KROONSTAD
9500
01 August 2019

The Principal
Free State School of Nursing
BLOEMFONTEIN
9301

Dear Ms Ralikonyana

REQUEST FOR USE OF FACILITY FOR MASTER'S RESEARCH: CHALLENGES FACING NURSE EDUCATORS IN THE IMPLEMENTATION OF HIGH FIDELITY SIMULATION AT A PUBLIC NURSING COLLEGE

I am currently a master's degree student at the University of the Free State, and have selected the above title for my dissertation. I would like to request your kind permission to use your nursing school with its three campuses for my research.

SANC has indicated that 20% of practical hours are to be spent in simulation in the proposed R171 professional nurse diploma course awaiting release for implementation in 2020. I have chosen to conduct this study at FSSoN as northern campus has a fully-equipped high fidelity simulation laboratory in place, and each of the other two campuses are equipped with an HFS maternity manikin, giving them access to HFS likewise.

I am in the process of completing the relevant proposal, upon completion of which I intend to present it to the University of the Free State Ethics Committee for ethical clearance and permission to continue. Once this permission has been obtained and an ethical clearance number has been assigned to me, I shall be able to complete the necessary documentation required by the Department of Health for permission and approval to use their institutions and personnel for the study.

I shall be grateful if you will kindly consider granting me your own gracious assistance together with that of the heads of the three campuses as liaison persons between the

participants of the study and myself, once the necessary documentation and processes have been followed, and permission has been obtained to carry out my study from the Department of Health at the FSSoN, of which you are the acting principal.

My research will include resourcing an experienced, qualified nominal group technique facilitator to facilitate a nominal group technique session. It is proposed that the participants of my research will include all nurse educators involved in demonstrating, facilitating and assessing nursing students' training and skills. This session is planned to take place in the campus boardroom on a morning that will be convenient to the campus, and after informed consent has been obtained from all involved.

It is my belief that this study will be effective in identifying challenges facing the personnel with regard to the implementation of high fidelity simulation as well as possible recommendations, thereby contributing to ensuring the smooth introduction of high fidelity simulation at your nursing college campus. Moreover, it is posited that this study will prove to be of value to other campuses into which high fidelity simulation may likewise be introduced in the foreseeable future.

I shall be grateful if you will favourably consider my request and look forward to receiving your reply.

Yours faithfully

J.M. Kapp
Master's student: University of the Free State

Appendix 5

Information brochure and informed consent for participants

Dear participant

Good day.
I am a master's student at the University of the Free State School of Nursing and am conducting my thesis on investigating the challenges of nurse educators in respect of high fidelity simulation (HFS) at a Free State Nursing College. The campus where you work comprises the ideal study population, since it has access to HFS.

In order for me to gather data which is vital to this study, I shall be most grateful if you will kindly take a few minutes to peruse the following information and to complete the attached informed consent form. Please note that consent to fill in this form and take part in this study is completely voluntary, and you have the right to withdraw from this study at any time you wish, without giving reasons and without affecting your relationship with the researcher.

You are invited to join a group session of approximately 60 to 90 minutes with your colleagues in order to discuss the challenges faced by nursing lecturers working at FSSoN in respect of HFS and its implementation in the new curriculum, necessitated by nursing moving to higher education. The nominal group technique, a problem-solving method, will be used. During this process, all participants will verbalize their own views on challenges facing nurse educators regarding the implementation of HFS at this nursing school. After all participant's contribution have been clarified, all will vote on their top five challenges. After these top five challenges have been identified, the technique will be repeated to identify possible solutions.

No participant's names will appear anywhere in the study, or be disclosed. Hence, confidentiality will be maintained throughout. The results may be presented at a meeting or congress, and/or published, but once again, confidentiality will be upheld throughout. There are also no known risks associated with this study.

Once all the data has been collected and processed, feedback will be given as requested. This study is intended to provide valuable insight into the challenges facing nurse educators with the implementation of HFS at this college, which will also be passed on to management. This study has the potential of identifying challenges and possibly solutions, leading to a smoother, more informed implementation of HFS in the new curriculum, benefiting management, personnel and students. Moreover, the results of this study will be of use to other nursing school campuses in the identification

of challenges facing their nurse educators with the implementation of HFS programmes at their nursing schools.

No costs or remuneration are involved in taking part in this study and refreshments will be served.

Permission to proceed with the research has been obtained from the Ethics Committee (HSREC) of the University of the Free State, the Free State Department of Health, acting principal and heads of campuses for you to participate in these nominal group sessions.

If you have any queries regarding this consent form, or if you would like to know more about the study, please contact the following persons:

- Maré Marais

Senior Assistant Officer: HSREC Systems, Administration and Operations

Health Sciences Research Ethics Committee

Faculty: Health Sciences

PO Box 339, Bloemfontein 9300, Republic of South Africa

EthicsFHS@ufs.ac.za

- Jacinta Kapp: researcher at 079 5135 895 or
- my supervisor, Mrs. Mandie Jacobs, at 051 4019 111

If you agree to participate in this research, please sign your consent with full knowledge of the nature and purpose of the procedures. A copy of this consent form will be given to you for safekeeping.

I thank you very much for your time and effort in taking part in this research.

Kind regards

Jacinta Kapp

DECLARATION OF CONSENT

I have read the contents of this information leaflet and hereby give my informed consent to take part in this study

…… …….

Participant Date

Appendix 6

Example of the verbatim responses of participants from Campus A collected during step 2 of the nominal group technique

Participant	Response
A1	State of readiness → Training of lecturers to use HFS.
	Availability of resources → Both human and material.
	Maintenance of HFS mannikin. This are generator operated, will need to be serviced at some stage.
	Support from the management
A2	Not completely prepared!!
	Venues and resources are a big problem.
	Personnel managing the simulation labs. Not enough manikins.
	Time frame to write scenarios for 2020!
	Equipment to manage/manipulate real life situations not available → technology not enough.
	Most important thing are money to equipt the lab → not sponsers yet.
	At this college, personnel to manage technology – student, lecturer and IT-person.
	Will have to have information sessions on how to write scenarios so that the student can benefit from the learning situation.
	To get equipment, eg. wound pack, gauze, stitch cutter is time consuming or the answer is sometimes there is no money.
	Students not use to this method. – preparation of the student.
	Really a new way of thinking!
A3	Lack of knowledge of capabilities of simulators
	Lack of staff to manage sim labs
	First time use of high fidelity as a requirement.
	Servicing and resources for the dolls