The introduction of high fidelity simulation learning into a pre-registration nursing course: the lived experience of nurse academics

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A thesis submitted in fulfilment of the requirements for the degree of

Doctor of Philosophy

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DECLARATION

Statement of Authentication

The work presented in this thesis is, to the best of my knowledge and belief, original except as acknowledged in the text. I hereby declare that I have not submitted this material, either in full or in part, for a degree at this or any other institution.

(Signature)
ABSTRACT

The introduction of high fidelity simulation learning into a pre-registration nursing course: the lived experience of nurse academics.

The aim of this study was to uncover the lived experiences of nurse academics when introducing, adopting and implementing a high fidelity simulation program in a school of nursing and midwifery at a large multi campus Australian University.

In recent times, in Australia and internationally, high fidelity simulation has been introduced as a teaching and learning strategy in health care education. This innovative strategy has been increasingly adopted into nursing programs in an attempt to address the many challenges facing nursing education and the health care system. Nurse academics are being challenged to prepare pre-registration nurses to enter a workforce with increasing complexities such as higher patient acuity, rapid changes in technology within the workplace, advancements in nursing and scientific knowledge, increasingly complex care management roles and a limited number of clinical placements for a growing number of pre-registration nursing students.

Simulation learning has been proposed to address some of these challenges by offering pre-registration nursing students opportunities to improve their clinical competence and workplace readiness in a safe learning environment. However, the adoption and incorporation of simulation learning into nursing programs has been varied and many institutions struggle to maximise the capabilities of high fidelity simulation and successfully integrate simulation learning into their curriculum.
A hermeneutic phenomenological approach was chosen as a method to provide a voice for the nurse academics involved in the adoption of the simulation program. This was a staged study with a convenience sample of ten academics in stage one and five academics in stage two. Ten face-to-face semi structured interviews were undertaken within the first three months of implementation of the program. Follow up interviews for stage two were conducted three years after full implementation across the pre-registration program.

The findings from the study highlighted three major themes with subthemes and minor themes. The first major theme illuminated the fundamental essence of being in the world of imposed change with sub themes of feeling disconnected and feeling underprepared. The participants felt a distinct lack of connection with the high fidelity simulation program due to lack of consultation from management and an absence of a guiding philosophy. They also experienced anxiety with feelings of being underprepared to effectively implement a high fidelity session.

The second theme to emerge was being in the world of implementing a new program with subthemes such as encountering communication and collaboration challenges, a sense of a struggle and feeling engaged. The participants voiced feelings of enthusiasm and engagement with the program however; they also experienced frustration with the lack of collaboration and communication between team members. There was a sense of struggle for the participants because of lack of technological readiness and lack of technical support to assist with successful implementation of a high fidelity session. In addition, the participants voiced
concern with large student numbers and feelings of isolation when facilitating the sessions.

**A high fidelity simulation program, three years on: a fractured journey** became the third theme. This depicts the journey that the participants experienced over the three years of program implementation. Whilst searching for meaning on this fractured journey, the dominant dialogue related to obstacles or barriers and lack of congruence in the engagement and uptake of this new program. The first subtheme to emerge was *encountering obstacles* with minor themes: *a diverse workforce and academic staff buy in*. The second subtheme was *technological investment versus human investment: a lack of congruence*.

The implications from these findings offers nurse academics and senior nursing academic management an insight into the experiences and barriers involved when adopting an innovative program such as high fidelity simulation into a pre-registration nursing program in Australia. It serves to promote an awareness of the importance of infrastructure and resources to enable successful integration into curriculum.
ACKNOWLEDGEMENTS

I would like to thank the following people who contributed to this study. Without their contribution and support this study would not have been possible. It has been a long and difficult journey. However as Tolkien, J.R.R. says

“It's the job that's never started as takes longest to finish.”

To the nurse academics that participated in this study, for giving me their time, sharing their thoughts and their experiences, I thank you.

To my wonderful supervisors, Dr Sharon Hillege, Dr Jennifer Hardy and Professor Virginia Schmied for their countless of hours of help and enthusiasm. I would never have made it without you.

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To my work colleagues and friends who cheered me on from the sidelines and encouraged me all the way. Thank you for your patience.

A special thank you to Isabelle Raisin for her assistance with end note and to my colleague Dr Eamon Merrick who spurred me on when times were tough.

Most importantly, to my family who have supported me and cheered me on. A special thank you to my daughters: to Ashleigh for being my critical friend, to Sophie
for her research assistance and to Lucy for keeping the kitchen afloat. To Brad, for believing in me and always supporting me and to Atticus for keeping me buoyant with the Sound of Music.

I would like to dedicate this thesis to my mother Joyce Frotjold who has been an inspiration to me always. I am sure that she would have loved to have shared this journey with me.
### GLOSSARY

<table>
<thead>
<tr>
<th>Term</th>
<th>Explanation</th>
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<tr>
<td>High fidelity simulation</td>
<td>For the purpose of this thesis high fidelity simulation will be defined as: a learning activity or technique which usually occurs in a dedicated space (simulation laboratory) and replicates clinical practices and situations to rehearse responses and improve performance with the use of a high fidelity mannequin (Seropian et al., 2004).</td>
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<tr>
<td>Low fidelity mannequins</td>
<td>Are static and lack the realism to enable the student to transfer the experience into a real life situation. The low fidelity models are often task trainers such as injection arms or head and chest models and useful for practicing psychomotor skills (Seropian et al., 2004).</td>
</tr>
<tr>
<td>Medium fidelity mannequins</td>
<td>Is a sophisticated mannequin with computer based scenarios and pulse, respirations and bowel sound capabilities however, there is no rise and fall of the chest. This lack of chest movement in the mannequin reduces the level of realism and complexity of the situation when compared with the high fidelity mannequin (Seropian et al., 2004).</td>
</tr>
<tr>
<td>High fidelity mannequins</td>
<td>Life-like characteristics of humans and experiences are created by a mannequin and or a theatrical interaction between role-players and props with mannequins (Jeffries, 2005).</td>
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<td>Term</td>
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<tr>
<td>Existentials</td>
<td>Existentials relate to the lifeworld of all human beings regardless of their background. van Manen uses these existentials as a guide for phenomenological questioning, reflection and writing throughout the research process (van Manen &amp; Adams, 2010, van Manen, 1997).</td>
</tr>
<tr>
<td>Lifeworld</td>
<td>The world of lived experience. Husserl (1970a) described lifeworld as that world which is already there, or pre given which is experienced naturally or primordially (van Manen, 1997)</td>
</tr>
<tr>
<td>Ontology</td>
<td>The study of being. “Ontological inquiry is concerned with what it means to be, with the Being of things or entities (Van Manen, 1997, p.183).</td>
</tr>
<tr>
<td>Lived Experience</td>
<td>This involves our “immediate, pre-reflective consciousness of life: a reflexive or self-given awareness which is, as awareness, unaware of itself” (van Manen, 1997, p. 35)</td>
</tr>
<tr>
<td>Debriefing</td>
<td>The defined time set aside after a simulation for facilitated discussion about the events which occurred in the learning activity (Jeffries, 2005).</td>
</tr>
<tr>
<td>Program</td>
<td>An alternate descriptor of the Bachelor of Nursing and its many streams.</td>
</tr>
<tr>
<td>Simulation</td>
<td>A learning activity or technique which usually occurs in a dedicated space (simulation laboratory or centre) and replicates clinical practices and situations to rehearse responses and improve performance. Simulation is the application of a simulator to training and/or assessment (ASSH,2012, p.13)</td>
</tr>
<tr>
<td>Simulation learning activity/exercise</td>
<td>Activities that are usually planned and scheduled into curricula; also see simulation (ASSH, 2012, p.13).</td>
</tr>
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</table>
KEY TO THE TEXT

In this thesis excerpts of transcripts from conversations and interviews with participants, as well as from written journal notes are used. Some editing of these transcripts has been necessary so that the written word reflects the spoken word. Any editing, such as the addition or subtraction of words, has occurred so that the reader will be able to follow the participant’s line of thought and the context of the situation being discussed. The deletion or insertion of words has not altered the original meaning of the text. Text alterations are symbolized in the following ways:

... An ellipse indicates that the speaker paused.

(...) A bracketed ellipse indicates where deletion of words or irrelevant material has occurred to enhance the sense of the text.

(words within) Brackets indicate insertion of a definition or complete word where the speaker used an abbreviation.

[words within] Square brackets around text indicate the insertion of words to clarify the meaning and/or context.

Italics Italics indicate direct quotes from interview transcripts.

To be compatible with the theoretical perspective from the interpretive paradigm the first person rather than the passive voice has been used in writing where relevant and pseudonyms used to identify the voices of the study participants.
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Chapter 1: INTRODUCTION

This chapter is an introduction to the thesis titled the introduction of high fidelity simulation learning into a pre-registration nursing course: the lived experience of nurse academics. It will orientate the reader to the aim, purpose and focus of the study. It will then include a brief explanation of each chapter.

There has been a rise in interest and use of medium and high fidelity mannequins in nursing education. This has gained momentum over the last 10-15 years. Many Schools of Nursing in Australia and internationally have purchased high fidelity mannequins with the expectation of establishing and embedding a simulation program in their nursing practice units for pre-registration and post graduate nursing students. However, the purchase of these mannequins is costly, as is the cost of establishment. In addition, there is ongoing maintenance as well as staff support, resources, staff development and also curriculum redesign (Brown et al., 2012).

1.1 Aim of the Study

The aim of this study was to uncover the lived experiences of nurse academics when introducing, adopting and implementing a high fidelity simulation program in a School of Nursing and Midwifery at a large multi campus Australian University.
1.2 Impetus for the Study

van Manen (1997) suggested that a common dilemma for scholars investigating a phenomenon is not “that we know too little about a phenomenon but that we know too much” (van Manen, 1997, p.46). In seeking to explore the phenomenon of nurse academics experiences I will first explicate my experiences and pre-understandings of the phenomenon. Gadamer, emphasised the importance of recognition of the researcher’s prejudices suggesting that it is this recognition that gives hermeneutics its real emphasis (Regan, 2012).

The following is a reflection of my experiences:

This research came out of my interest and experience as a nurse academic with over fifteen years of experience working in the area of nursing practice/clinical education and simulated learning activities with pre-registration students. Throughout my career my main focus has been on the development of ‘thinking’ nurses and as a facilitator in the clinical laboratories I constantly challenge students by asking questions of why, how, what are your priorities and rationales for care with a focus on reflective practice.

A number of years ago I was appointed as the academic advisor for the clinical laboratories in a School of Nursing at an Australian University. At this time the
School of Nursing was expanding and new clinical laboratories were to be built. It was also around the time that simulation in the United States (US) was gaining momentum and I started to read the simulation literature from the US. This influenced my already changing thought patterns in relation to the need to contextualise learning experiences by providing real case scenarios for students that could be transferred into practice learning exercises, in the clinical nursing laboratories. Because of my role as advisor for the clinical laboratories I was able to guide the purchase of equipment to enable the development of a number of simulation laboratories. My aim was for students to engage in experiential learning with a focus on patient-centred care and therefore I felt that we needed to purchase mannequins that would enhance this focus and hence the learning experience for students. The mannequins that were chosen for the clinical laboratories were medium fidelity mannequins such as Nursing Anne® and Mega Code Kelly ® which are made by Laerdal Medical. We were fortunate to have sufficient funding to enable a ratio of 2-3 students per mannequin. At this ratio, the students were able to engage in team work and practical learning in context.

A simulation interest group was set up at the school with a motivated team of nurse academics with the support of the Head of School. With impetus from the group we were able to integrate simulation learning using medium fidelity mannequins across the three years of the pre-registration program. To get this program off the ground took a team effort and many hours of work outside scheduled working hours. A few years after the implementation of this program, the Dean of the faculty attended a conference and instructed the Head of School that we were to incorporate the use of two high fidelity mannequins into the program. She also instructed the Head of
School to find space to accommodate SimMan® in an already overcrowded clinical simulation laboratory. There was no consultation with any of the simulation interest group and the students extra practice room was removed so that the mannequins could be set up. I felt quite resentful at this time as I had promoted a practice ethos within the student body, where students had their own space for independent practice and this space was to be removed. None of the academics in the faculty had any prior experience with high fidelity mannequins and so the mannequins sat in their box for over a year until we could figure out what to do with them. The only education that we had was from Laerdal, the company that manufactures the mannequins.

After a year and some pressure from the Head of School a small number of academics including myself and an interested technical officer set the mannequin up with a lot of help from the Laerdal representative. The simulation group then commenced a small pilot project using the high fidelity mannequin for advanced life support. It was very much trial and error as there was no infrastructure or structured plan for implementation and no education of academic staff or technical staff to support the program. I felt that we were just muddling along. A short time later an opportunity was offered to me at another university and I transferred there. My expertise with simulation learning was a major focus of the interview at this new university and I assumed that a simulation program was in place. However, as I commenced my employment I quickly realized that there was a high fidelity mannequin in-situ but it was not operational and would require a lot of work to get it up and running. The same problems that had occurred at the previous university with lack of infrastructure were apparent again. However, this time I was not given
a position of leadership within the clinical laboratory program to implement changes. I felt very frustrated and disillusioned. Nevertheless, I remained committed to the promotion of the effectiveness of simulation learning activities for students.

The impetus for this study emerged from this background. Reflection on my experiences led me to question the validity of these experiences and the importance of uncovering what it is like for nurse academics when implementing a new innovative program such as simulation. Whilst there is some literature in relation to barriers to faculty uptake of simulation programs, a paucity of current literature is evident examining the experiences of nurse academics in the introduction of a simulation program using a high fidelity mannequin. I felt that a hermeneutic phenomenological research approach was important to give a voice to the experiences of academics when introducing, adopting and implementing a simulation program.

These reflections led me to the research questions below:

### 1.3 The Research Question

The research questions that guided the study were:

- How do faculty prepare for the introduction and implementation of a new teaching modality, such as a high fidelity simulation program, in a School of Nursing and Midwifery at a large multi campus Australian University?
What is the nursing academics experience of introducing, adopting and implementing a high fidelity simulation program into nursing practice units of study, within a nursing curriculum?

Exploring the lived experiences of the nurse academics may open up further possibilities for understanding in this area. It is envisaged that the outcome of the study will inform nurse academics and senior nursing academic management in the following areas:

- The roles associated with effective uptake of a simulation program.
- The resources and infrastructure required to successfully implement a program.
- The communication channels necessary for successful uptake of the program.
- How to effectively integrate simulated learning experiences into nursing curricula.
- Contribute to the body of knowledge and understanding related to the use of simulation in the preparation of pre-registration students.

1.4 The structure of the study

This was a staged study with a convenience sample of ten academics in stage one and five academics in stage two. In stage one, ten face to face semi structured interviews were conducted within the first three months of implementation of the simulation program. Follow up interviews for stage two were conducted three years
after full implementation of the simulation program into the pre-registration nursing practice units.

1.5 Background

Contemporary nursing education has been faced with many issues and challenges when preparing pre-registration nurses for the workplace. These challenges include rapid changes in technology, advancements in nursing and scientific knowledge. As well as increasingly complex care management roles, faster work environments and the expansion of specialised and technological areas for the nurse. In addition, within the health care system in Australia and internationally, there has been a rise in the level of patient acuity, shorter hospital stays for surgical patients, sicker patients staying in hospital longer, as well as the challenge of an increasingly aging population. All these factors have placed greater demand on the workload and requirements of health service delivery (Brown et al., 2012; Duffield, 2011).

Patient safety and the quality of patient care has also become a major issue and is receiving attention from government bodies, consumer advocacy groups, health care agencies and the media (Arthur, Kable & Levett-Jones, 2011; Health Workforce Australia (HWA), 2010; Jeffries, 2005; Nehring, 2008). A number of initiatives focusing on the improvement of patient safety and quality care have recently been implemented in the health service delivery area in Australia (Australian Commission on Safety and Quality in Health Care, 2013; Clinical Excellence Commission, 2014).
Within this climate, employers are also demanding from universities that nursing graduates are prepared for and functional within the real world of nursing. Therefore, it is imperative that nursing students receive adequate clinical experience (Jeffries, 2005; Nehring, 2008). Nursing students learning involves a scope of complex cognitive and intellectual activities during which they integrate existing theoretical and practical knowledge with hands on engagement with patients. According to Benner (2015), teaching a practice discipline such as nursing requires a focus on experiential teaching and learning. Students require the ability to be able “to both acquire and use knowledge in particular clinical situations” (Benner, 2015, p.3). To accomplish this, students need effective learning experiences both in university and also in the clinical setting.

However, to enable these quality clinical experiences for pre-registration nursing students, nurse educators are confronted with a number of complexities. These complexities include: increasing student enrolment and demand, inconsistencies amongst clinical experiences for students, lack of availability of clinical sites, increasing competition for clinical placements, staff fatigue and reluctance of nursing staff to supervise students (Baxter, Akhtar-Danesh, Valaitis, Stanyon & Sproul, 2009; Tanner, 2006; Onda, 2012). In addition, there is increased competition in the employment of facilitators to supervise clinical placements (HWA 2010; Jeffries, 2005,). These elements have amplified the challenge of delivering sufficient and effective clinical learning practices for contemporary nursing students. Students need to be adequately prepared for transition to practice in a diversity of
areas such as acute care, primary care, aged care as well as community settings (Brown et al., 2012). Clinical placement numbers were estimated to be 16,434 for all pre-registration nursing students in 2013, in New South Wales, Australia. Moreover, nursing student intake numbers are expected to rise by a total of 10.2% between the years of 2013 to 2019, therefore creating an even larger burden on securing quality clinical placements for nursing students (Health Education and Training Institute (HETI), 2015).

Baxter et al. (2009) concur with these findings suggesting that in the present health care environment, the accessibility to clinical environments, which enables students to perfect their skills, is no longer guaranteed. Nehring (2008) argues that in the current climate of both quality and quantity of clinical experiences for nursing students, it is essential to add the use of simulation as an adjunct to clinical nursing education to adequately prepare students for the growing demands in the health care industry.

In 2008, the Council of Australian Government (COAG) recognised the challenge for students in health related disciplines in the area of clinical education in Australia and substantial funding was contributed to this area. Health Work Force Australia (HWA), a national health workforce agency, was given the responsibility to lead the national coordination. The task of the HWA was to oversee initiatives in a number categories such as clinical training; clinical supervision; simulated learning and
education initiatives; interdisciplinary training; and the census of clinical placements (COAG, 2008, HWA, 2010).

Simulated learning was one area flagged as important and an investment in excess of $95 million was allocated by COAG for the development of simulation resources Australia wide (Brown et al., 2012). The focus for this development was on expanding the capacity of simulation in all health areas including regional, remote and rural settings; enabling implementation of simulation into education programs; increasing cross collaboration between universities and hospitals and the development of evidence based research in this area (HWA, 2010).

This impetus for the introduction of simulation learning in Australia and internationally has gained momentum in recent years, in order to address some of the challenges inherent in the preparation of nursing graduates for the complex environments of the health care system. Further, it has been suggested that simulation learning provides pre-registration nursing students opportunities to improve their clinical competence and workplace readiness in a safe learning environment. However, whilst positive outcomes have been documented in the areas of increased student satisfaction, clinical skill acquisition, confidence and competence and clinical reasoning there remains a paucity of research that indicates transferability of learning outcomes from the simulation learning environment to the clinical environment (Kardong-Edgren, 2010; Levett-Jones, Lapkin, Hoffman, Arthur, & Roche, 2011).
In addition, the adoption and incorporation of simulation learning into nursing programs has been varied and many institutions struggle to maximize the capabilities of high fidelity simulation and successfully integrate simulation learning into their curriculum (Taplay, Jack, Baxter, Eva, & Martin, 2015). In order to facilitate the uptake of simulation learning it is imperative to understand the barriers that affect uptake within nursing education. Thus further investigation is necessary to uncover the nurse academic’s experiences when introducing, adopting and implementing high fidelity simulation learning activities into a nursing curriculum.

1.6 Organisation of the thesis

The thesis is organized into distinct chapters.

In Chapter One an introduction to the background of the study is presented. The impetus for and the significance of the study is articulated. The aims and the research questions are highlighted and the chapter concludes with an overview of the organisation of the thesis.

In Chapter Two a comprehensive review of the literature is outlined. In this chapter an overview of the history of simulation is presented followed by a review of the dominant research relating to simulation learning and nursing practice and simulation as a teaching and learning strategy in nursing. The framework by Jeffries
(2005) related to designing, implementing and evaluating simulation is also explicated. This framework is used in numerous research projects related to simulation in nursing as is Roger’s diffusion of innovation theory (2003). Roger’s diffusion of innovation theory (2003) is also outlined. Finally, literature relating to uptake of simulation learning by faculty is examined.

In **Chapter 3** the philosophical framework used to guide the study is discussed. The origins of phenomenology are highlighted. Hermeneutic phenomenology is introduced and the work of Heidegger, Gadamer and van Manen are explicated. The chapter concludes with an explanation of the relevance and appropriate ‘fit’ of hermeneutic phenomenology to the study aims.

In **Chapter 4** a description of the processes used to collect and manage the data are presented. The trustworthiness of the data collected and ethical issues are addressed. In addition, a general introduction to the 10 participants is provided. An overview of the research process of data analysis using van Manen’s six methodological themes is also explored.

In **Chapter 5** the analysis of the participants narratives are presented. The analysis involved immersion in the transcripts and the reading and re-reading of each transcript as a whole and in parts. van Manen’s (1997) method for isolating thematic elements of a phenomenon in a text were then used. Two major themes
emerged from the narratives of the participants in stage one of the study. The themes are: *being-in-the-world of imposed change* with sub themes *feeling disconnected* and *feeling underprepared* and *being-in-the-world of implementing a new program* with subthemes *encountering communication and collaboration challenges*, *a sense of a struggle* and *feeling engaged*.

In **Chapter 6** the analysis of the participants’ narratives from stage two of the study are explicated. The major theme uncovered from the participant’s experiences is a *high fidelity simulation program three years on: a fractured journey*. A number of subthemes were identified. The first sub theme to emerge was *encountering obstacles* with minor themes *a diverse workforce* and *academic staff buy in*. The second subtheme was *technological investment versus human investment: a lack of congruence*.

In **Chapter 7** a broad discussion is presented that reflects on the integration of the themes and the interpretation of the findings within the context of current literature. The data is also examined from an ontological perspective to uncover further meanings and understanding.

In **Chapter 8** a conclusion to the study is provided. An overview of the lived experience of nurse academics when introducing, adopting and implementing a simulation program using a high fidelity mannequin in a School of Nursing and
Midwifery at a large multi campus Australian University is presented. Limitations of the study and recommendations for successful implementation of high fidelity program and for further research are discussed.

In summary, in this thesis I have explored the lived experiences of nurse academics when introducing, adopting and implementing a simulation program using a high fidelity mannequin in a School of Nursing and Midwifery at a large multi campus Australian University. A hermeneutic phenomenological methodology is used to discuss and identify the “universal essences” of the lived experiences of these nurse academics.

The outcomes of this study can increase the understanding of the important concepts involved in the introduction, adoption and implementation of a simulation program for nurse academics in schools of nursing.
Chapter 2: LITERATURE REVIEW

In this chapter, the literature that was used to inform the study will be reviewed. This review will commence with a brief chronological history to provide a background to health care simulation, followed by a review of the simulation literature in contemporary nursing education and Roger’s diffusion of innovation theory. The chapter will conclude with an exploration of the literature surrounding nursing faculty uptake of simulation.

The operational definition of health care simulation I used in this study is provided:

> Simulation is an educational technique that replaces or amplifies real experiences with guided experiences that evoke or replicate substantial aspects of the real world in a fully interactive manner (ASSH, 2012).

2.1 Search strategy

The search strategy for this review included publications which explored simulation in health care between the years of 2000 and July 2015. There has been an exponential growth of literature in simulation in health care over the last 5-10 years. An extensive search of the literature was undertaken to find studies that examined the use of simulation in health care and more specifically nursing education. The search terms included: nursing, education, nursing education, health, simulation, human patient simulation, academic, barriers or factors, diffusion of innovation, staff turnover. The search was conducted in the following
databases: CINAHL, Medline, Scopus and Eric. In addition Proquest dissertations were searched to uncover any unpublished dissertations and published books related to simulation. The search was limited to English language publications and focussed on International and Australian publications. The reference lists of publications were also examined to identify any other relevant publications. These publications were then critically appraised and reviewed for methodological merit. Further, literature was identified, assessed and synthesised to focus on the history of simulation, the use of simulation in nursing education, and uptake of simulation technology in nursing programs.

Both quantitative and qualitative studies have been reviewed in order to explore the current literature relating to nursing faculty uptake of simulation and to identify any gaps in the literature. Over 60 articles have been used to inform this review. In keeping with the phenomenological method, a second literature review was undertaken after data analysis to compare findings with up to date and available information. Endnote software was used to organise and manage the references.

2.2 Chronological history of simulation in health care

The use of simulation in health can be traced back several centuries. In the 18th century in France, a foetal model and pelvis was used to train midwives by Madame Du Coudray (Ker & Bradley, 2010). Models were also used around this time in medicine to educate students in anatomical structures of the body (Bradley, 2006). In 1911, “Mrs Chase” a life sized mannequin with jointed hips, elbows and knees was developed for use in nursing education. The purpose of this mannequin was to allow nursing students to practice their skills without causing harm or discomfort to
patients (Nehring, 2010). The production of “Mrs Chase” mannequins continued until the late 1970’s with improvements allowing for more sophisticated procedures involving the urethra, genitalia and bowel. Injections were also able to be given in the arm via an injection pad (Nehring, 2010).

According to Bradley (2006), in the 20th century there were distinct movements involved in the development of clinical simulation in health care. The first movement was with the creation of the Resusci Anne® mannequin by Asmund Laerdal in 1958. Resusci Anne® was a low fidelity part-task trainer developed as a training model for cardiopulmonary resuscitation. This mannequin was well received by health care educators as it was affordable and an effective tool for training (Bradley, 2006).

The second movement was influenced by the aviation industry. The aviation industry had developed flight simulators because of public attention on pilot error. The aviation and military fields had been using high fidelity simulation as an educational strategy since the 1930’s. Flight simulators were implemented to train pilots and crews for the complexities of flying an aircraft and in the military for weapon and vehicle training in a safe and controlled environment (Gaba, 2007; Hovancsek, 2007). The use of flight simulators were mandated for all commercial and military pilots. The use of simulators enabled pilots to gain experience under difficult conditions in a safe and controlled environment (Hyland & Hawkins, 2009).

Health care educators identified a link between the use of simulation in the aviation industry and its potential for the preparation of health care workers for unpredictable or adverse patient care scenarios. As a result, the second movement
of health care simulation was associated with an increased awareness of the use of
technology with a focus on improvement in patient safety. Sim One, a sophisticated
mannequin which replicated aspects of the human patient was developed in the
late 1960’s by Abrahamson and Denson. The Sim One mannequin had breathing
and heart rate capabilities and could also respond to drugs and gases administered
intravenously (Bradley, 2006). It was predominantly used for the education of
resident doctors undergoing training in anaesthetics. However, this form of
simulation did not achieve wide spread attention in other areas of the health care
arena (Bradley, 2006). Following this period, with the creation of more realistic
human patient simulators (HPS), simulation was integrated into the curriculum for
anaesthetists in the late nineteen eighties (Gaba, 2007; Issenberg, McGaghie,
Petrusa, Lee Gordon, & Scalese, 2005). At this time there was increased interest in
simulation as a teaching tool within nursing and health care education (Rystedt &
Lindström, 2001).

The third movement of simulation in health care education commenced in the
1980’s and it continues today. This movement involved increased use of technology
and in the 1990’s; the computerised mannequin was further developed with the
introduction of a high fidelity simulator by Medical Education Technologies (METI).
The high fidelity simulator possessed cardiovascular, respiratory, neurological and
pharmacological capabilities and was adopted mainly for anaesthetic training. It was
expensive and therefore the cost limited its use for training in other areas of health
care (Rizzolo, 2014). Laerdal Medical, another medical technology company then
introduced a high fidelity mannequin called SimMan®. This simulator was expensive
but more affordable and SimMan® opened up the market for additional companies
to start producing mannequins of differing levels of fidelity at affordable prices for the health care market, especially in the area of nursing (Rizzolo, 2014). During the third movement changes in educational practice emerged as educators started to acknowledge the increasing complexity of the clinical environment. As the technology improved more clinical skills could be simulated and therefore educators believed that simulation could assist in the education of health care practitioners (Harder, 2009).

Gaba (2007) suggests that simulation is an educational strategy not a technology however, simulators are often used in simulated learning experiences. Fidelity simulation has been defined as the degree of realism that the simulation creates (Jeffries & Rogers, 2007; Seropian, Brown, Gavilanes, & Driggers, 2004). According to the Jeffries Framework (2007), fidelity is quantified in terms of low, medium and high fidelity. This is in reference to the technology level of the simulated mannequin. The framework suggests that fidelity can be understood along a continuum that varies according to the extent to which the simulation mimics reality (Hovancsek, 2007). However, it is apparent that there is no clear consensus of a definition of fidelity in simulation practices within healthcare. It has been purported that the term fidelity has been used inconsistently (Arthur, Kable, & Levett-Jones, 2011; Paige & Morin, 2013).

In addition, Groom, Henderson, and Sittner (2014), assert from their literature review that the search term “fidelity” and “simulation” occurred in more than 1000 citations and different interpretations of the term were evident. The first interpretation related to a generic description of an immersive simulation
experience and the second interpretation related to “the level of realism of the clinical setting or simulator used in the simulation experience” (Groom et al. 2014, p.339). Another group of simulation scholars also found the term ambiguous suggesting that a more appropriate definition of fidelity in simulation relates to the intrinsic properties of simulation focusing on the extent to which a simulation “whether it is physical, mental, or both, represents a given frame of reality in terms of cues and stimuli, and permissible interactions” (Tun, Alinier, Tang, & Kneebone, 2015, p. 6).

Whilst acknowledging the ambiguity of the term, the following three classifications of fidelity simulation mannequins have been used in this study.

The low fidelity mannequin is static and lacks the realism to enable the student to transfer the experience into a real life situation. Low fidelity models are often task trainers such as injection arms or head and chest models and useful for practising psychomotor skills (Seropian et al., 2004). A limitation of low fidelity simulation is that it does not evolve nor does it provide the situational context needed for a real life situation. Instead, low fidelity simulation provides an opportunity for the student to learn a skill in isolation (Seropian et al., 2004).

The medium fidelity mannequin is computer based with embedded software that can be controlled with a hand held device (Arthur et al., 2011). They have pulse, respiration and bowel sound capabilities however, there is no rise and fall of the chest. This lack of chest movement in the mannequin reduces the level of realism and complexity of the situation when compared with the high fidelity simulation
mannequin (Seropian et al., 2004). Moderate fidelity simulators are considered “useful as both introduction tools and tools for developing deeper understanding of specific, increasingly complex subject matter and competencies” (Seropian et al., 2004, p. 165).

High fidelity mannequins are sophisticated computerised mannequins that enable individualised scenarios to be programmed to be as close to reality as possible. According to Hovancsek (2007) the high fidelity patient simulator is extremely realistic providing a degree of interactivity for the student. The simulation mannequin has the physical appearance of reality as well as the physiology and ability to react automatically or manually in a realistic manner to many student interventions. The mannequin not only has a pulse, respirations and bowel sounds, but the student can also observe the rise and fall of the chest and respond to different computer generated scenarios in a timely and realistic manner. The scenario created using a high fidelity patient simulator can offer a realistic situation of what students might expect with a live patient and hence provides the environment to simulate actual patient responses when students intervene. It has been purported that the use of high fidelity simulation mannequins assists in the development of critical thinking and increased levels of reflection on learning (Jeffries, 2007; Rothgeb, 2008). Examples of high fidelity simulators include SimMan® by Laerdal and METI® mannequins.

According to Jeffries (2005), the increase in sophistication of the medium and high fidelity human patient simulator (HPS) has made simulation technology appealing
enabling students to practice opportunities using ‘true to life’ scenarios that they may encounter in clinical practice without the potentially harmful effects on the patient.

2.3 Nursing practice and simulation research

In this section of the review, the focus is on literature relating to the major areas of research interest in the domain of nursing practice and simulation.

There has been a large body of literature related to student satisfaction with simulated learning experiences in nursing and other health care areas (Alfes, 2011; Anderson, 2007; Baxter et al., 2009; Levett-Jones, McCoy, et al., 2011; Mole and McLafferty, 2004; Roehrs and Smith, 2009; Zulkosky, 2012). Conversely, Kardong-Edgren (2010) believes that whilst knowledge of student satisfaction for students is important, research needs to address higher levels of evaluation such as the effectiveness of simulation as a predictor for student efficacy in the clinical area.

Enhancement in self-confidence and competence in students has also been an area of interest within the simulation literature. The majority of studies agree that students exposed to simulation exercises show an increase in feelings of confidence and competence in their clinical practice, however the extent of the transferability of this learning to the clinical environment needs further investigation (Alinier, 2003; Garrett, MacPhee, and Jackson, 2010; Gordon and Buckley, 2009; Gordon et al., 2013; Kaplan, Holmes, Mott and Atallah, 2011; Mole and McLafferty, 2004; Nickless, 2011; Reilly and Spratt, 2007; Rystedt and Lindström, 2001; and Schoening, Sittner, and Todd, 2006). Conversely, Alinier, Hunt, Gordon, and Harwood (2006)
found in their pre/post-test design study that there was no improvement in student confidence following a high fidelity simulation session.

Clinical reasoning and critical thinking is another area that has been in the forefront of the nursing simulation literature. Current research in this area has been performed by scholars such as Lasater (2007), Ravert (2008), Lapkin, Levett-Jones, Bellchambers, and Fernandez (2010), Levett-Jones, Lapkin, Hoffman, Arthur, and Roche (2011), Levett-Jones, Hoffman, et al. (2011), Guhde (2011), Wood and Toronto (2012) and Goodstone et al. (2013).

Lasater (2007) developed a rubric to measure clinical judgement based on Tanner's (2006) model of clinical judgement which focussed on noticing, interpreting, and responding. The rationale for the development of the rubric was to provide descriptors of student performance in relation to four levels of expertise ranging from beginning to exemplary clinical judgement. It was purported that this would give students the language to articulate their progress and to provide stimulation for students to achieve higher levels of clinical judgement. This rubric has been tested and modified in a number of other studies (Ashcraft et al., 2013; Cato, Lasater, and Peeples, 2009; Shin, Shim, Lee, and Quinn, 2014). The findings from these studies appear positive, however, further refinement is needed. Adamson, Gubrud, Sideras, and Lasater (2012) assessed the reliability and validity of the Lasater rubric recommending that evaluation data should be considered as a snapshot in time as part of a broader evaluation. They also suggested that the reliability of the instrument is dependent on the characteristics of the rater and the
scenarios used in the simulation. They expressed caution related to the 
generalisability of the findings.

An Australian systematic review conducted by Lapkin et al. (2010), investigated the 
effectiveness of the use of human patient simulation manikins in teaching clinical 
reasoning skills to undergraduate nursing students. The findings from this review 
indicated that the use of human patient simulation manikins increased knowledge 
acquisition, critical thinking and the detection of the deteriorating patient which are 
all important components of clinical reasoning. However, the results were equivocal 
in determining the effectiveness of teaching clinical reasoning skills using human 
patient simulation manikins. The authors suggested that this finding occurred 
because none of the reviewed studies specifically evaluated clinical reasoning skills 
in undergraduate nursing students and the effect of human patient simulation 
manikins.

In addition, Levett-Jones, Lapkin, et al. (2011) in a large scale Australian study 
examined the impact of simulated patients and information and communication 
technology on nursing students’ clinical reasoning. They reported that exposure to 
high fidelity simulation learning activities has the potential to improve nursing 
student’s clinical reasoning ability however, further research in this area is needed. 
A clinical reasoning model has been developed by this team to further investigate 
the effect of clinical reasoning and the improvement in nursing competence (Levett-

Another area with a major focus on the nursing practice and simulation area has 
been on clinical skill acquisition. Studies by numerous authors have focussed on,
and found improvement in clinical skill acquisition following simulation learning (Ackermann, 2009; Alinier et al., 2006; Alinier, Hunt, & Gordon, 2004; Gordon & Buckley, 2009; Melnyk, 2008; Moule, Wilford, Sales, & Lockyer, 2008). However, these studies also show limited transfer of skills into performance outcomes in the clinical area.

2.4 Simulation as a teaching and learning strategy in nursing

One of the initial frameworks specific to simulation in nursing education was developed by Jeffries and her team in 2003. It was published in 2005, and revised in 2007 and 2012. Jeffries (2005) focussed primarily on developing a framework for the use of simulation in nursing education to promote competence in nursing students. She believed that there was a need for a consistent and empirically supported model to guide design and implementation as well as assess learner outcomes during simulated learning experiences for students (Jeffries, 2005). The framework has five conceptual components. These conceptual components include: the teacher; the student; educational practices; simulation design characteristics and expected student outcomes.

**Teacher characteristics** are the first component of the framework. It focusses on the teacher as student centred and a facilitator of learning for the students. The teacher’s primary role is to support and encourage the student throughout the simulated learning experience. Within this component the teacher’s demographics are included as they are believed to be associated with the teacher’s role, comfort levels and use of simulation.
**Student characteristics** are the second component of the framework. There is an expectation that the student is a self-directed and motivated learner. It is suggested that ground rules of the simulation are discussed with students prior to the simulation learning experience with a focus on learning and the acknowledgement that it is a safe environment where mistakes can be made. Student demographics such as the type of program that the student is enrolled in, year of study and student age are also included in this component of the model.

The component of **educational practices** addresses the different learning styles that need to be considered when designing a simulation experience for students. The features include: active learning, diverse learning styles, collaboration and high expectations. The following component focuses on the simulation design characteristics.

**Simulation design characteristics** include aspects such as setting objectives to guide learning; the level of fidelity of the simulation; problem solving relating to the level of complexity of the simulation; and the level of support provided to the student within the simulation exercise. The final aspect of the simulation design characteristic focusses on reflective thinking or debriefing. Debriefing has been highlighted as an important aspect as it enables the student to reflect on what has happened during the simulation such as their actions, decisions and communication skills. A requirement of the reflection is that it is guided by the teacher to facilitate the student’s connection between theory and practice and the learning outcomes of the session.
The last component of the framework is **expected student learning outcomes**. This component is linked to the student’s learning outcome and focuses on knowledge gained, skills performed, learner satisfaction, critical thinking skills and student feelings of confidence following the simulation exercise (Jeffries, 2005).

The following diagram highlights Jeffries (2005) simulation framework indicating the interconnections between the teacher student and educational practices which then influences the design characteristics of the simulation exercise and the learning outcomes.

![Diagram](image)

*Figure 1 Jeffries (2005, p.23) model of the framework for designing, implementing and evaluating simulations.*

The Jeffries framework was developed initially from research literature related to simulation in the areas of nursing, medicine and other health and non-health related areas. It was then tested in a national, multi-site, multi-method project in the United States over a three year period led by the researcher. The purpose of the
The study was to uncover what teaching and learning practices within simulation would contribute to positive student outcomes; to develop the skills and knowledge of nurse academics so that they could use simulation in innovative ways; and to develop a simulation design that contributes to the overall teaching and learning design for the student (Jeffries, 2007).

The findings from this study indicate the importance of educational practices and simulation design characteristics in the simulation framework to enable a quality learning experience for nursing students. It was also found that the simulated learning environment provided the student with a realistic non-threatening environment to enable application and synthesis of knowledge. In addition, it can be extrapolated from these findings that the simulation experience encouraged students to have active involvement whilst applying observational, assessment and critical thinking skills, as well as the ability to analyse their performance in a facilitator guided debriefing session. It was asserted that this would lead to a reported increase in self-confidence and competence for the nursing students (Jeffries, 2007). The author, whilst acknowledging that further research needs to be done in this area, presented their framework to assist nurse educators and researchers in the development of cost effective teaching strategies (Jeffries, 2005).

A number of studies have used Jeffries nursing education simulation framework to inform their research (Arthur et al., 2011; Kardong-Edgren, Starkweather, & Ward, 2008; Schlairet & Pollock, 2010; Smith & Roehrs, 2009) to name a few. A critique of Jeffries simulation framework was conducted by LaFond and Van Hulle (2013). They examined sixteen publications from the United States and the United Kingdom that
had used Jeffries framework to guide their research. Their findings suggested a need for empirically defined concepts and propositions of the framework to be further explicated. They found positive student outcomes in the areas of student satisfaction, confidence and improved skill performance which have been highlighted in the literature discussed in the previous section of this chapter. However, there was limited support for the proposition that student variables such as experience in nursing prior to formal education would change the learning outcomes for the student. There was also no research support evident in the assertion by Jeffries (2005) that teacher demographics could affect the comfort levels and overall use of simulation by faculty. The authors of the review recommended further research into the area related to student and teacher concepts as well as investigation into student attitudes, communication skills, team building and patient specific outcomes. A further recommendation was the need for more research to be performed in this area outside the United States to uncover the relevancy of the model to nursing programs in other countries (LaFond & Van Hulle, 2013).

Following on from Jeffries early work the literature related to simulation as a teaching and learning strategy has increased markedly. Laschinger et al. (2008), examined the effectiveness of simulated learning experiences in pre-licensure health professional students. In this systematic review literature from 1995-2006 was examined focussing on twenty three studies, with six of these specific to the discipline of nursing. In this review experimental and quasi experimental designs such as non-randomised controlled trials, and before and after studies were included. The review also incorporated learning exercises with partial task trainers
and high fidelity patient simulators. The findings indicated that there were positive results in the area of nursing student satisfaction and student confidence with clinical skills were increased. However, there was no conclusive evidence concerning the transfer of student’s ability to function effectively in the clinical area. These findings have been highlighted in research studies in the previous section.

Another systematic review by Cant and Cooper (2010), focussed on the effectiveness of medium and high fidelity simulation as a teaching strategy compared with traditional teaching techniques in nursing education. The authors reviewed peer reviewed studies that used experimental or quasi-experimental designs. They focussed on studies from 1999-2009. Twelve studies that met the reviewer’s criteria were included. The participants were predominantly undergraduate nursing students, however, in two of the studies, registered nurses and new graduate nurses were included. It was discovered that simulation learning was an effective method of education for nursing students. Of the six studies which involved the use of control groups, half of them reported an increase in knowledge, critical thinking and satisfaction and perceived clinical confidence. The findings were statistically significant and Cant and Cooper (2010) concluded that the strength of the review was in its identification that medium and/ or high fidelity simulation was an effective teaching and learning method. They acknowledged the limitations of the systematic review and recommended further exploration as well as the development of a universal method of outcome measurement.
Similarly, Harder (2010) conducted a systematic review examining the use of high fidelity simulation as a teaching and learning tool in health care education. The review was limited to those studies published from 2003-2007 with twenty three studies included, sixteen of which were specific to nursing. The researchers categorised the articles into areas of practice, evaluation, type and influence on student performance. The use of simulation rather than traditional methods as a teaching modality in the majority of studies was seen to improve student clinical skills and perceived confidence. However, three of the studies found no difference between the two teaching modalities. The authors recommended the need for the development of outcome measurement tools for simulation.

Weaver (2011), conducted an integrative review examining the use of high fidelity simulation in undergraduate nursing education. In the review a total of 24 articles were examined. The results that emerged indicated that there was a positive effect on student confidence and knowledge acquisition which is consistent with previous simulation research findings. However, the author could not identify whether there was the transfer of student confidence from the simulation learning exercise to the clinical setting. It was identified that students valued high fidelity simulation and believed that it created a realistic learning environment. This finding is also consistent with previous research findings in relation to student satisfaction. The author recommended further research to identify the benefits of high fidelity simulation in undergraduate nursing education as well as the transfer of knowledge and student confidence into the clinical area. She also suggested the importance of determining whether an increased use of simulation is warranted.
Conversely, Kirkman (2013) investigated the transfer of knowledge and skills learned by undergraduate nursing students from the classroom to the high fidelity clinical simulation setting, and then into the traditional clinical setting. The students in the study were observed and rated at four different times. They were observed in the clinical setting prior to the intervention, after a traditional lecture, after a simulation exercise followed by observation in the clinical setting. Descriptive and inferential statistics were used to analyse the data and the researcher found that there was a significant difference in transfer of learning demonstrated over time. The author suggested that this is an important finding as the results indicated a positive transfer of knowledge and skills from high fidelity simulation learning exercises to the traditional clinical area. This study although a convenience sample of 42 participants is significant as it indicated a positive outcome in regards to student learning and hence strengthens the argument for high fidelity simulation as an effective teaching and learning tool. The authors recommended further study with a larger population.

A recent meta-analysis by Shin, Park, and Kim (2015) investigated the effectiveness of patient simulation in nursing education. They explored quantitative evidence with twenty studies meeting the inclusion criteria. The participants ranged from undergraduate students to graduate students and nurse practitioners. The researchers focussed the meta-analysis on evidence relating to the effects of patient simulation in various learning environments and the use of different evaluation techniques. The findings indicated that the evaluation outcome
demonstrated a larger effect size in the area of psychomotor skills, affective and cognitive skills. They also found a larger effect in studies with graduate nurses and nurse practitioners and suggested that simulation could be used as a motivating factor for improving clinical decision making. It appeared that senior nursing students were more likely to have an increased benefit from simulation as opposed to more junior students. The overall findings indicated that simulation had a positive impact on improving student learning outcomes compared with no intervention or the traditional educational mode. However, the review did not discuss the transfer of the student learning outcomes into the clinical area. The authors acknowledged limitations in the study in regards to the limited number of studies included and a small number of participants in a number of the reviewed studies.

### 2.5 Faculty uptake of simulation education

Faculty uptake of simulation education is another area that has aroused interest within the simulation education community. According to Waxman and Miller (2014), faculty development is the key to a successful and ongoing simulation program. It is imperative for faculty to possess the knowledge to develop, implement and evaluate simulated learning scenarios. Whilst some researchers have used other methodologies to describe nursing faculty uptake of simulation, a majority of studies used Roger’s diffusion of innovation theory to guide faculty uptake of simulation activities (Hagner & Schneebeck, 2001; Hanberg, 2008; Irwin, 2011; Issenberg, 2006; Kardong-Edgren et al., 2008; Miller & Bull, 2013;
Starkweather & Kardong-Edgren, 2008). This is a congruent theoretical framework to adopt in order to contextualise my study.

Roger’s (2003) developed the diffusion of innovation theory to offer insight into issues facing organisations attempting to incorporate an innovative technology into their work practices. It was developed as a communication process and diffusion, is defined in the following way: “the process by which an (1) innovation is (2) communicated through certain channels, over (3) time, among the members of a (4) social system” (Rogers, 2003, p.11). These four elements need to be explicated to better understand Roger’s diffusion of innovation theory and its inclusion into the simulation education literature in relation to the adoption of simulation learning in nursing programs. The first element of the communication process is innovation.

**Innovation**

Rogers (2003, p.12) suggested that an innovation is “an idea or practice that is perceived as new by an individual or other unit of adoption”. According to Rogers (2003), there are five perceived attributes of an innovation that impact on its rate of adoption. These include relative advantage, compatibility, complexity, trialability and observability.

- **Relative advantage** relates to the degree that an innovation is better than its predecessor. This may be measured by its economic value, satisfaction and convenience.

- The second characteristic is **compatibility** and it focusses on whether the innovation is compatible with the needs, attitudes and values of the potential adopter.
• The third characteristic, **complexity** relates to the level of difficulty of the innovation as perceived by the adopter. The simpler the innovation the more readily it will be adopted.

• The degree to which an innovation can be experimented with on a limited basis is the focus of the fourth characteristic, namely, trialability. Rogers (2003) suggested that if an innovation is trialed by the potential user it is more likely to have a rapid uptake as exposure creates less uncertainty.

• **Observability** is the fifth characteristic and refers to the “degree to which results are visible to others” (Rogers, 2003, p.16). In other words, if the individual can visualize the results of the innovation it will be adopted more rapidly. Rogers suggested that visibility can initiate peer discussion of the innovation followed by a request for further information (2003).

According to Rogers (2003) innovations that are perceived to possess the above five attributes are likely to be adopted more rapidly than other innovations.

**Communication**

Communication channels are the second element in Roger’s diffusion of innovation theory. Communication channels may be defined by the way information is transferred or shared to enable a mutual understanding between individuals or groups. It is how we convey a message from one individual to another specifically about the innovation.

**Time**

The third element is the time involved in the diffusion of an innovation. The time dimension is linked to the innovation-decision process and there are five main steps
involved in this procedure which include: knowledge, persuasion, decision, implementation and confirmation.

- The first step is *knowledge* which is evident when an individual becomes aware of the innovation and gains some understanding of its purpose and function.

- The second step is *persuasion* whereby the individual forms a positive or negative opinion of the innovation. Persuasion then flows on to the decision making aspect where it is decided whether the innovation will be adopted or rejected.

- The *decision* step is where the individual decides to accept or reject the innovation

- The *implementation* step is apparent when the innovation is being used.

- The final step is *confirmation* which occurs “when an individual seeks reinforcement of an innovation-decision that has already been made” (Rogers, 2003, p. 20) however if conflicting information is received the decision may be rescinded (Rogers, 2003).

**The social system**

The fourth and final element of the communication process is the social system. As mentioned previously the process of the innovation is influenced by the social system. It includes all the members of the group from the individual to informal and formal groups as well as the organisation. According to Rogers (2003) the social system creates a boundary for the diffusion of the innovation. It is important to take into account the social system as its members are interested in the impact that the
innovation will have on them and this aspect will either impede or facilitate the innovation. The innovation is also affected by the characteristics of individuals within the social system. Rogers (2003) also suggested that there are five categories of adopters within a social system which include: the innovator, the early adopter, the early majority, the late majority and the laggards.

- The first category is the innovator who actively seeks out the innovation and is interested in new technologies and new ideas.
- The second category, the early adopter is often the leader or change agent for the innovation. They are cautious and will adopt after carefully analysing the innovation.
- The third category is the early majority who adopt the innovation soon after the early adopters. They are not leaders but follow after careful deliberation.
- The late majority is usually skeptical of the innovation and may join as a result of peer pressure.
- The final category is the laggards who are the last in the social system to adopt the innovation. Prior to adoption by the laggard, they need to ensure that the innovation is not likely to fail (Rogers, 2003).

A deeper exploration of the studies that have been guided by Roger’s diffusion of innovation theory as they relate to faculty uptake will be explored below.

Starkweather and Kardong-Edgren (2008) used Roger’s (2003) diffusion of innovation theory to guide the embedding of a simulation program into the
curriculum of a large undergraduate nursing program. Whist their commentary was largely anecdotal, the authors found that with the use of diffusion of innovation theory they were able to build faculty interest and enthusiasm for the use of simulation within their program.

Another descriptive study related to diffusion of human patient simulation into an undergraduate nursing degree was conducted by Irwin (2011). The focus of Irwin’s research was on a three year process guided by Rogers (2003) diffusion of innovation theory. The author expressed a similar conclusion to Starkweather and Kardong-Edgren (2008). The findings indicated that there were positive outcomes when a structured process was implemented. These structured processes included involving administrators and faculty and a formalised plan for implementation. The plan included not only the purchasing of equipment but also education of faculty about the use of the equipment.

Whilst some of the current literature, largely anecdotal, describes the implementation of simulation programs into nursing curricula as successful, there is also a body of literature that has highlighted the uptake of simulation learning as being problematic. This view is supported by Hanberg (2008), who focussed on the diffusion of high fidelity simulation in nursing education describing the barriers and providing recommendations for best practice. This study used a non-experimental correlational design with a non-probability convenience sample of 228 nursing faculty members. Roger’s diffusion of innovation theory and Jeffries simulation framework were the theoretical frameworks used to guide the study. The findings
from the study indicated that the characteristics of the innovation, the adopter and level of funding can be significant barriers to uptake of high fidelity simulation by faculty members. Hanberg (2008) found that the level of simulation fidelity and complexity of the simulation impacted on the uptake. Other contributing factors identified by participants were work overload, lack of release time to learn the new innovation and faculty shortages. He also found that early adopters were usually younger than fifty years of age. In addition, the cost of equipment, maintenance and lack of human resources were also identified by participants as barriers to adoption.

Adamson (2010) investigated faculty experiences and barriers and facilitators when integrating human patient simulation into associate degree nursing curricula. The study was descriptive and data were collected from online surveys. In this study a number of barriers were highlighted which included: a lack of time to integrate simulation into courses; and a lack of support resources and funding for support resources. These support resources included staff training and staff support as well as ongoing maintenance of equipment. Adamson (2010) noted a low response rate from the surveys and indicated that there were many questions unanswered by the study. In conclusion, Adamson acknowledges that the study may not be considered a complete reflection of the topics.

In another study, researchers examined factors contributing to the limited use of human patient simulators. They used convenience sampling of nursing faculty in a staged study in a large nursing program in the United States. Data were collected by
electronic survey in phase one of the study and, in phase two, an educational program intervention was implemented and evaluated also via electronic survey (King, Moseley, Hindenlang, and Kuritz, 2008).

The authors indicated that the lack of training of faculty members prior to the implementation of the program impacted on their levels of comfort and confidence when teaching in the program. However, the use of the educational intervention had a profound impact on faculty members, increasing their feelings of comfort and competence. It can be suggested from these findings, that attitude was the strongest predictor of faculty use of human patient simulation. In addition, participants in the study reported the need for increased support from laboratory personnel, an instructor guide and further education to improve uptake from faculty members. The researchers highlighted, that the small nonrandomised sample without a control group in a single faculty was a limitation of the study. Therefore, they recommended further research in this area (King et al. 2008).

A study that concurs with the findings of King et al. (2008), in relation to nursing faculty attitudes, was conducted by Akhtar-Danesh, Baxter, Valaitis, Stanyon, and Sproul (2009). They used the Q-methodology technique to explore nursing faculty perceptions of simulation use in nursing education. In their study they identified four prominent viewpoints in relation to faculty perspectives of the use of simulation in undergraduate nursing education. The faculty perspectives were outlined as positive enthusiasts, supporters, traditionalists and help seekers and were related to the attitudes of the faculty members. These findings indicated that
whilst some faculty had differing viewpoints, most perceived simulation to have positive benefits to student learning. However, there was also a strong belief amongst faculty members that additional support in terms of teaching hour allocation; human resource support and a repository for clinical resources such as developed scenarios are important aspects to be considered for successful implementation. These findings concerning the need for additional support when implementing simulation learning have been documented by numerous other scholars such as Arthur et al. (2011), Jones and Hegge (2008), Jeffries (2008), and Jansen, Johnson, Larson, Berry, and Brenner (2009).

Jansen et al. (2009) used a qualitative descriptive design study to investigate nursing faculty perception of obstacles in utilisation of manikin-based simulations. The participants highlighted that there was a lack of time to adequately focus on the necessary components such as preparation time and writing scenarios to enable effective implementation of simulation learning. The area of staff training was also identified as deficient. Other findings suggested that faculty required instruction and education in the usage of high fidelity equipment, scenario writing and facilitation of a high fidelity learning exercise. In this study, the attitude of faculty was also identified as another obstacle to uptake by faculty. Faculty attitude as an obstacle has also been identified in studies by King et al. (2008) and Akhtar-Danesh et al. (2009). Lack of space and equipment was also highlighted as a detractor. As well as this, obstacles namely, insufficient funding in areas such as staffing, purchase and maintenance of equipment, were seen as barriers to faculty uptake. The inadequacy of human resource personnel to assist faculty when facilitating an
effective simulation learning session was also identified as an impediment. This finding has also been highlighted in studies by Arthur et al. (2011), Akhtar-Danesh et al. (2009), King et al. (2008), Hanberg (2008), Howard, Englert, Kameg, and Perozzi (2011) and Davis (2012).

Jansen et al. (2009) also found that faculty were concerned about large class sizes which curtailed the ability to engage students in the simulated learning activity and manage the remaining class members. The authors presented a number of suggestions to address each of the areas of identified obstacles such as support for faculty training, retreats and workshops. In conclusion, the authors identified the narrow focus of the research design and suggested further research to address a broader focus on nurse educator characteristics.

A recent Australian study using an exploratory research design and Roger’s diffusion of innovation theory by Miller and Bull, (2013) identified factors influencing the adoption of simulation in nurse academics teaching practices. A number of themes emerged which included: simulation as a separate entity, getting political and academic adaptation. The themes were analysed using the persuasion phase of Roger’s diffusion of innovation theory (1995, 2003). As a reminder, the first attribute of the persuasion phase is relative advantage. In this phase the participants questioned whether simulation was more beneficial than their current practice. They measured the relative advantage of simulation in relation to the quality of the student learning experience. The second attribute, compatibility, was measured by the participants in terms of the pedagogical benefits of simulation as
well as the participants’ access and ease of implementation. The participants, whilst
acknowledging the importance of simulation as a learning and teaching modality
also experienced feelings of dissonance due to their perceived powerlessness in the
decision making process when the program was introduced. The next attribute
complexity relates to how easy the innovation is to use. The academic and logistical
hurdles that needed to be undertaken to see the visible results of an innovation
relates to Rogers (2003) attribute of observability. In this study the participants
identified the separate nature of simulation to their current practices of education
and questioned the underlying pedagogy and the ‘fit’ of simulation in their
program.

The ability to play with the equipment was a significant finding of the research and
Roger’s concept of trialability became a necessary component that had the
potential to increase uptake. Miller and Bull (2013) suggested that for simulation to
achieve optimal use in nurse education its aims and outcomes need to be well
articulated. The authors noted a number of limitations to the study due to the small
participant group in a single site. However, as this was a qualitative study it is
difficult to generalise findings. The authors believed that their findings add insight
into the factors influencing the adoption of a simulation program by nursing faculty
members.

Two other grounded theory studies relating to faculty uptake were reviewed as
well.
Smitten (2013) conducted a grounded theory study to investigate the processes used to prepare nursing faculty in the area of high fidelity simulation. She took a social-psychological stance, and investigated nurse educators’ experiences when preparing for their teaching role with the use of high fidelity simulation (Smitten, 2013). Major themes became evident from this process. These were *muddling through*, *introspecting* and *questing to evoke and enrich* with the emergence of the core variable which was *Finding Their Way*.

The theme of *muddling through* depicted feelings of bewilderment and confusion which created feelings of anxiety for the participants and led them to the next dominant theme of *introspection*, where the nurse academics reflected on their role in order to seek clarification and to improve practice. The third major theme was *questing to evoke and enrich*. As part of *questing* it was evident that nurse academics sought ways and information to further develop and enhance their roles. According to Smitten (2013), this theme evolved from the participants insisting that further education was essential to their role. She indicated that they cited the need for education in the underlying pedagogy of simulation, as well as knowledge of best teaching practices. In her study she recommends future formalised programs for nurse academics involved in high fidelity simulation programs. Whilst Smitten (2013) provides insight into the nurse academics experiences when teaching in a high fidelity program, she does not explain the processes involved in successful implementation.
Taplay et al. (2015) added to the discussion on faculty uptake with a grounded theory study investigating the adoption and incorporation of simulation into nursing programs in Canada. The study included semi-structured interviews with nursing administrators, faculty members and simulation leaders. Seven key phases were described: securing resources; nursing leaders working in tandem; getting it out of the box; learning about simulation and its potential for teaching; finding a fit; trialling the equipment; and integrating into the curriculum.

The first phase involved securing resources. In this phase participants identified that significant initial resources were required for the purchasing of equipment, securing physical space, maintenance, additional supplies and human personnel.

In the second phase leaders focussed on working in tandem. The authors highlighted that this phase was time consuming as the role of a simulation leader needed to be developed. The success of the role was reliant on the simulation leader working in tandem with nursing administration. A cohesive partnership between the simulation leader and nursing administration was presented as a positive force behind effective adoption of simulation within nursing curricula.

“Getting it out of the box” was the next phase highlighted by the authors. This proved to be a stumbling block, as in some academic institutions it took three years to get the simulation equipment out of its box, yet in others it took no time at all. Indeed, in some institutions it was only when external pressure was exerted from on-site accreditation bodies that implementation took place.
Learning about simulation and its potential for teaching was recognised and it was undeniable that many nursing faculty members required extensive education about the simulation equipment and its potential as a teaching strategy.

As well as this, the finding a fit phase involved the identification of where simulation could be aligned within the curricula and this was also found to be important as well as trialling of the equipment.

The trialling phase allows the academics to play and practice with the equipment. The authors envisaged that trialling the equipment enabled the participants to formulate an opinion and evaluate its capabilities. This finding is consistent with Rogers (2003) diffusion of innovation theory as well as the descriptive study findings conducted by Miller and Bull (2013).

Integrating into the curriculum was the final phase presented by the authors and this involved a shift in thinking. Integration was perceived to occur when “simulation as a teaching strategy moved from an idea to action to the belief that it was a viable choice to fill curricular gaps or be used as an adjunct for clinical experiences” (Taplay et.al., 2015, p. 31).

It was recognised by the authors that in order to move through each phase significant support from all levels of the institution were required. They conclusively suggest that to effectively adopt and incorporate simulation into the curriculum, it
is essential to have a commitment by the institution in the areas of space, professional development (including trialability) and decision making (Taplay et al., 2015).

Taplay, Jack, Baxter, Eva, & Martin, (2014b) also focussed on organisational culture and how it shapes the adoption and incorporation of simulation into nursing curricula. Using grounded theory as a methodology, they developed the Organisational Elements that Shape Simulation in Nursing theory (OESSN), and proposed five key organisational factors at the nursing program level for the adoption of simulation. These factors included: leaders working in tandem; information exchange between nursing leaders, faculty members, collaborative partners and differing levels of interested parties within the institution; physical locale which was associated with not only the availability of space for simulation but also the location of the space for the simulation activities; shared motivators or a collective response; and scaffolding to manage change. This involved the development of a framework to enable movement through the process of adoption and incorporation. The authors suggested that these characteristics can provide insight into key organisational elements when incorporating simulation into curricula. They further commented that nursing programs that adopt the OESSN theory may experience a faster uptake of simulation into their nursing program.

Taplay, Jack, Baxter, Eva, and Martin (2014a) also proposed three strategies to shape the adoption and incorporation of simulation into nursing curricula. They suggested that nursing faculties that had a high uptake of simulation learning
embedded into their curricula had nurse administration and simulation leaders working closely together using strategies of negotiation, navigation and networking.

The *negotiation* that the leaders were involved in related to matters of resources both technical and human. They also indicated that these leaders had to negotiate space and lobby with upper administration in relation to the importance of simulation learning to the faculty.

The authors also described a theme of *Navigating*. They equated this to navigating a path through uncharted territory. They indicated that the adoption of simulation required a clear plan and also direction from the leader. Indeed, they found that the leadership styles that were most successful and created high uptake of simulation learning were those of participatory leadership where input is encouraged by all members and shared decision making is encouraged. The second method was delegatory, which involves unilateral decision making at the onset of the initiative with the expectation that simulation will be incorporated into the curriculum. At this time, it does not include much input from others. They point out that once the decision has been made, the simulation leaders need to be given power to incorporate simulation into the curriculum. Taplay et al. (2014a) found that when participatory and delegatory methods of leadership were used nurse administrators were able to engage simulation leaders and nursing faculty to work together. When a *laissez faire* style of leadership was used the faculties had difficulty in finding direction and therefore uptake of simulation was haphazard.
Networking was also found to be an important factor in increasing the momentum of embedding simulation learning in the curriculum. The creation of connections by nurse administrators and simulation leaders with individuals within their institution and within the broader nursing community was seen as integral because it opened communication channels for shared resources and information.

In this study the importance of shared leadership between nurse academics and simulation leaders to enable a higher uptake within the nursing program was emphasised. The authors also found that nursing leaders who employed the strategies of negotiating, navigating and networking were “able to secure necessary resources, collaborate with key stakeholders, gain information, create a vision, and forge a course of action through uncharted territory” (Taplay et al., 2014a, p. 6). It was suggested that further research is needed to develop and evaluate guidelines for implementation, the role of nursing leaders and organisation culture theory.

Levels of adoption of human patient simulation manikins and information communication technology in Australian Schools of Nursing have also been an area of interest in a recent Australian study by Arthur et al. (2011). The authors conducted a cross sectional web based survey to detect levels of adoption. They had a 75% response rate from the 32 nursing schools invited to participate in the study. The aim of the survey was to investigate the type and level of simulation used, information related to school size and infrastructure, and staffing and roles within the clinical laboratories. In addition, the survey included questions regarding pedagogical principles and practices, simulation use for assessment, evaluation,
research, and information technology use in the clinical laboratory setting. The pedagogical principles underpinning simulation activities in the survey were based on Jeffries (2007) framework of simulation in nursing education. The findings of the study indicated that overall Australian schools of nursing are committed to the development of simulation within their programs. However, they found variation in the level of uptake, methods of simulation and a lack of pedagogical underpinnings in many of the schools in the study. They also found that many of the nursing schools have geographically isolated campuses, large numbers of students and large laboratory class size numbers which can impact on successful implementation of simulation learning activities. They suggested the need for adequate funding and staff training opportunities and infrastructure to promote successful and quality use of these technologies as at this point their capabilities are not being used to their full potential.

A further study on the use of human patient simulation mannequins in the Australian context was conducted by McGarry, Cashin, and Fowler (2014). The findings from their survey indicated that the level of adoption in human patient simulation in Schools of Nursing is comparable between Australia and the United States. They also found a lack of explicit pedagogical theory underpinning simulation activities which is a similar finding to those of Arthur et al. (2010).

2.5 Summary of the nursing literature

In this chapter, a background to simulation in health care has been provided to provide a context for the study. A discussion outlining the definition of the term
fidelity has been presented, acknowledging that there is no clear consensus of the term fidelity in simulation practices. The research literature in the area of simulation in health care has increased exponentially over the last two decades, and, in the nursing literature, the major focus has been in the area of clinical skill acquisition, student satisfaction, competence and confidence, critical thinking and clinical decision making. Despite the abundance of literature in this area, the majority of authors were unable to establish transferability of learning into the clinical area. However, one study indicated a positive transfer of knowledge from the simulation environment to the clinical setting, which according to Kirkman (2013), strengthened the argument for the use of high fidelity simulation as an effective teaching tool. The authors also acknowledged the limitations of the study due to a small convenience sample.

An overview of Jeffries (2005) framework for designing, implementing and evaluating simulations was given as this framework has guided numerous research projects in the area of simulation and nursing. Jeffries framework has been critiqued and further research was suggested to support the relevance of the framework in the United States and other countries. A number of studies, largely descriptive and anecdotal, were reviewed focussing on the uptake of simulation learning using Roger’s diffusion of innovation theory as a guide. This theory was found to be useful when considering uptake of simulation learning as it purports to offer plausible insight for organisations wanting to incorporate innovative technology into work practices. This framework has been elucidated in this review.
Further descriptive studies highlighting barriers to uptake by faculty were also reviewed. Faculty attitude both positive and negative were presented in several studies as an important factor in the strength of the uptake and the time taken for implementation of a simulation program. Significant barriers were identified such as lack of educational programs in both pedagogical principles and technical knowledge, lack of human resource personnel, large class sizes, insufficient funding for staff and equipment and increased staff workload. All studies highlighted that further research was required in these areas.

Recent research from North America used grounded theory as a method to investigate the adoption of simulation and barriers to uptake by nursing faculty. Smitten (2013) focussed on the nurse educator’s experiences from a social-psychological perspective finding that there was initial ‘muddling through’. She highlighted the importance of faculty education to enable successful integration into the curriculum. Taplay et.al. (2014a, 2014b, 2015) stressed the importance of a shared leadership between nursing administration and simulation leaders when implementing a simulation program. Further to this, Taplay et.al. (2014b) suggested that for successful implementation there must be integration into the curriculum, areas of space provided, and time for professional development. In addition, key organisational elements are considered paramount.

In an Australian context there has been limited research specifically in the area of uptake by faculty of simulation learning. Arthur et al. (2011) and McGarry et al. (2014) investigated levels of adoption of human patient simulation manikins and found a broad
variation in uptake in Schools of Nursing, methods of simulation practices and a lack of pedagogical underpinning. Another Australian study by Miller and Bull (2013), used a descriptive study to uncover factors influencing the adoption of simulation in nurse academics teaching practices.

Following examination of the literature, there appears to be no research in the area of the lived experiences of nurse academics when introducing, adopting and implementing a high fidelity simulation program across a multi campus faculty in an Australian context. According to Munhall (2012), the lived experience of each individual is a consolidation of all previous experiences and therefore each phenomenological study is considered to be unique. Therefore, the exploration of the nurse academics lived experiences from an Australian context can be seen as a valuable contribution to the simulation literature.

In the following chapter, the philosophical framework for the study will be addressed.
Chapter 3: PHILOSOPHIC FRAMEWORK

In the previous two chapters the background, context, and literature to support the development of the study reported in this thesis have been presented. An overview of the philosophical framework that informed this study will be discussed in this chapter.

After many months of deliberation, examination of the literature and discussion, I was able to identify the research question and hence the methodology for the study. van Manen (1997) advises, that a research method is only a way of exploring particular kinds of questions. The question is the beginning, however, there is “a certain dialectic between the question and method” (van Manen, 1997, p.2) and the method one chooses needs to encompass a certain harmony within a persons' particular sphere of interest (van Manen, 1997). Therefore, it became evident from my deliberations that my choice of methodology to guide this study needed to be able to explicate the meaning of the experiences of nurse academics during the introduction, implementation and adoption of a high fidelity simulation program. I felt that the research methodology which provided the best voice for these experiences was hermeneutic phenomenology.

3.1 Phenomenology: an overview

Phenomenology has been described as the science of phenomena and the study of the lifeworld (van Manen, 1997). In its simplest definition it can be described as the study of things or phenomena (Taylor, 2013). Phenomenology is both a philosophical
movement and a method; however it must be acknowledged that it is first and foremost a philosophy. Phenomenology requires us to examine human life as it is lived and experienced to better understand its meaning. It also offers “the possibility of plausible insights that bring us in more direct contact with the world” (van Manen, 1997, p.9). The aim of phenomenological research is to enrich our understanding of everyday life experiences and this, in turn may transform our sense of being and hence our practices. The phenomenological text flourishes on the dialectic between individual and shared spheres of the lifeworld. Absence of this tension reduces the impact of the research and the ability to uncover the assumed dimensions of everyday existence.

As this study is informed by the hermeneutic phenomenological method, an overview of the phenomenological movement from Husserl's transcendental phenomenology to the hermeneutic work of Heidegger, Gadamer and van Manen will be provided to enable a deeper understanding of the methodological choice for this study.

3.1.1 Husserl

Phenomenology developed from a diverse and complex historical background. However, it is commonly acknowledged that the founder of the contemporary phenomenological movement was Edmund Husserl (Taylor, 2013). Therefore, it is relevant in the context of this study, to give a brief overview of Husserl’s philosophical tenets. Husserl believed that fundamental recognition of experience was the basis and meaning of knowledge. He presented the notion of the 'lifeworld' or 'lived experience' to describe everyday experiences. Husserlian
Phenomenology has been described as transcendental because of its focus on consciousness and knowing as a way to unite subject and object. Husserl was interested in the meaning of the human experience and how we come to know things in our world, or how they appear through consciousness (Laverty, 2003). He asserted that the lifeworld is experienced pre-reflectively without interpretation (Dowling, 2007).

Three dominant concepts are integral to Husserlian phenomenology. These concepts are intentionality, essences and phenomenological reduction or bracketing. Husserl described intentionality as the directedness of the mind towards objects and this assumption was based upon the certainty of conscious awareness. He suggested that the intentional content of the mind was like a description of reality and it was this description that enabled a person to perceive, remember, and desire a particular object (Koch, 1995). He asserted that the essence of something relates to its true meaning and it represents the basis of understanding of any phenomenon (van Manen, 1997).

Further to the concept of intentionality and essences, Husserl presented the notion of phenomenological reduction, whereby preconceived ideas are eliminated. He believed that the highest level of transcendental phenomenology is to be able to disconnect or bracket the individual consciousness from the outer world. For Husserl, the notion of bracketing was imperative to the validity or objectivity of interpretation, as it protected against the self-interest of the researcher as individual biases are separated out (Koch, 1995; Laverty, 2003).
Therefore, Husserl asserted that with the use of bracketing the individual is able to achieve contact with essences (Laverty, 2003).

Husserl believed that phenomenology seeks to uncover the very nature of a phenomenon and he refers to this as 'to the things themselves' (Taylor, 2013, p.77). He uses this phrase to uncover and describe the meanings of the lived experience (van Manen, 1997). Husserl concluded that human beings only know their reality by attending to the “essences that constitute the consciousness and perception of the human world” (Koch, 1995, p.828). Further, the essence of a phenomenon can only be understood by examining the internal meaning of a phenomenon as it is encountered in the lived experience (van Manen, 1997).

Both Heidegger and Husserl were concerned with lived human experience and the concept of the lifeworld, however, Heidegger further developed the notion of the lifeworld into a more existentially oriented phenomenology utilising an ontological focus. Heidegger's philosophy has been described as an extension to Husserl's work; however, it does not adhere to Husserl's epistemological focus on knowledge and consciousness. Where Husserl focussed on describing and understanding beings or phenomena, Heidegger examined the notion of 'being' or Dasein the meaning of ‘being in the world’ (Earle, 2010; Laverty, 2003). Heidegger proposed the fundamental question of what it means to exist (to be) at all (Gelven, 1989). For Heidegger, the concept of knowing came from understanding and meaning (McConnell-Henry, Chapman, & Francis, 2009). Heidegger rejected Husserl's notion of bracketing asserting that humans are by nature interpreting beings and any attempt to bracket out experiences is
unachievable. Moreover, Heidegger believed that “experience was already out in the world, experience is not a thing, but a movement in the world” (Moules, 2002, p. 7). As a result of their philosophical differences, Heidegger disassociated himself from Husserl’s epistemological phenomenology developing his own distinctive philosophy known as hermeneutic phenomenology (Gelven, 1989).

In this study the participants are nurse academics situated within the world of nursing education in a university setting, and the aim of the study was to uncover their lived experiences of being-in-the-world of the introduction, adoption and implementation of a high fidelity simulation program. Therefore, to be able to understand the meaning of the nurse academics experiences within this world it would be impossible to bracket out my prior experiences as a nurse academic with expertise in high fidelity simulated learning. According to Heidegger (2010), this awareness of past experiences, is integral to the interpretive process (Laverty, 2003). In light of this, hermeneutic phenomenology was chosen as the best framework to inform this study. In the next section, hermeneutic phenomenology will be discussed with a focus firstly on the origins of hermeneutics, followed by the hermeneutic phenomenology of Heidegger, Gadamer and van Manen.

3.1.2 Hermeneutics

The language of texts is at the heart of hermeneutics. Hermeneutics has a history that dates back to the seventeenth century (Converse, 2012; Moules, 2002; Crotty, 1998). It was first developed by theologians to assist in text interpretation of the bible. The technical method used by the theologians was called hermeneutics (Sokolowski, 2000). The word hermeneutics is derived from the Greek verb,
hermeneuein 'to interpret' and from the noun, *hermeneia*, interpretation' (Moules, 2002). In the eighteenth century, hermeneutics was utilised by other disciplines for interpretation of works of art, literature and music, and in the early nineteenth century to aid in methodological discussions of the nature of history (Carr & Kemmis, 1986). In the late nineteenth century, German social theorists such as Wilhelm Dilthey, Heinrich Rickert, Georg Simmel and Max Weber sought to replace the dominant positivist approach to social sciences with an extension and elaboration of hermeneutic interpretation as an epistemological base (Carr & Kemmis, 1986).

The positivist tradition had been at the forefront of the social sciences and focussed on prediction, explanation and control. This alternative epistemological base was concerned with notions of understanding, meaning and action (Carr & Kemmis, 1986). It was Dilthey (1985) who moved hermeneutics beyond the interpretation of texts to the importance of interpretation of the lived experience in human understanding.

A basic premise of hermeneutics is that the world is interpretable (Moules, 2002). Moules suggests that hermeneutics adds a difference to phenomenology by asserting that objects are interpretable things rather than fixed and immovable. Heidegger (2010), specifically linked hermeneutics with phenomenology stating ".... the meaning of phenomenological description is interpretation" (p. 38). According to van Manen (1997), hermeneutic phenomenology is both descriptive and interpretive in terms of its methodology. He asserts that it is descriptive because it wants to let things speak for themselves but it is also interpretive, because there are no such things as uninterpreted phenomena (van Manen, 1997).
3.1.3. Heidegger

As mentioned previously, Heidegger distanced himself from Husserl’s preoccupation with intentionality, consciousness and reductionism to focus on an ontological and hermeneutic perspective (van Manen & Adams, 2010). According to Heidegger, the primordial ontological question is paramount for philosophical inquiry. The question ‘What does it mean to be’ comes before any examination of what is known of truth, existence and reality (Mackey, 2005; Gelven, 1989). For Heidegger, being is the most universal concept (Taylor, 2013).

Five major philosophical assumptions embedded in Heidegger’s phenomenology will be discussed in the following sections: being-in-the-world; time/temporality and space; understanding and the hermeneutic circle.

3.1.3.1 Being-in-the-world

Heidegger in his seminal work Being and Time, first published in 1927, asked the fundamental question of the meaning of being (Heidegger, 2010). Heidegger emphasised the ontological meaning of being-in-the-world, calling it Dasein. Dasein can be singular or refer to a general way of being. It encapsulates the situated meaning of humans in the world or mode of being (Anells, 1996). For Heidegger, understanding and possessing self-awareness is part of Dasein’s ontological makeup and the capacity to self-reflect on Dasein’s own existence is integral to being (Moules, 2002). To enable this to happen, existence is paramount and Dasien understands itself in terms of its own existence (Heidegger, 2008). Dasein is fundamentally a hermeneutic being with self-interpretation at its core.

3.1.3.2 Time, Temporality and Space

For Heidegger, *Dasein* is located in history and therefore the understanding of time is central to the understanding of being (Heidegger, 2010). In addition, human experience is grounded in time and is fundamental to the understanding of being and when experienced, gives meaning to the person’s lifeworld. Moreover, temporality, according to Heidegger, denotes an awareness of time through the person’s experience of being in time (Mackey, 2005). “Historicality is the temporality of *Dasein* as a historical being- one existing in time through its orientation between the past and the future (this orientation makes the present meaningful)” (Tietz, 2001, p.28). *Dasein* in the active unity of the past, present and future is actively temporal in the existential projection enabled by the potentiality of being (Heidegger, 2010). This unity means that what was experienced in the past is cohesive with experiences of the present and, in turn, will inform experiences in the future (Mackey, 2005). “*Dasein* sees the future as consisting of its own possibilities, that the future has meaning in so far as one is aware of and is capable of possible ways to be” (Gelven, 1989,p.186). The concept of time as temporal is integral to hermeneutic phenomenological research as the researcher and participants experiences are situated in time to uncover ontological understanding (Mackey, 2005, p.183).

Heidegger asserts that we are in our own temporo-spatial context because of being-in-the-world. He asked the question ‘what does it mean to be in space? He called
the spatial belongingness ‘the there’ and suggested that everything in the world belongs somewhere (Mackey, 2013; Miles, Francis, Chapman & Taylor, 2013). Heidegger asserts that space is created by the way in which Dasein perceives things as ‘close’ or ‘far away’. Moreover, to be in space is a necessary way that Dasein is in the world (Gelven, 1989).

3.1.3.3 Understanding

Heidegger believed that understanding (Verstehen) is a basic form of existence. It operates by presenting before Dasein its possibilities (Gelven 1989). For Heidegger, this presentation of possibilities is in itself an existential. “This means that to throw before ourselves our own possible ways of existing is an essential characteristic of what we are” (Gelven, 1989, p. 89).

Critical to the process of understanding is interpretation. Heidegger sees interpretation as something extra, but asserts that it is essential to enable understanding to be complete (Gelven, 1989). This assertion suggests that one must have an awareness of possibilities to have human possibilities. Further, our understanding becomes explicit by understanding it as something (Gelven, 1989). Heidegger proposed three basic considerations related to his account of interpretation: (1) the as-structure, (2) the fore-structure, and (3) meaning.

(1) As-structure: The as-structure of understanding is concerned with the objects in our world presenting themselves in terms of serviceability, in other words, their purpose (Doyon, 2015). In order to articulate the concept of as-structure Heidegger distinguishes between objects that are ready-to-hand and present-to-hand. He believes that we normally encounter things in terms of their familiarity and usefulness and therefore, something that is ready-to-hand is regarded as useful. He
uses the example of a hammer which shows itself as something useful for the purpose of building a house or hammering two pieces of wood together. This usefulness occurs because the person has interpreted what is there according to their everyday understanding of it (Doyon, 2015; Gelven, 1989). On the other hand, Heidegger suggests that if the person merely looks at an object and does not make use of it, the object moves further away from its proper meaning and it is then classified as present-to-hand and not useful (Gelven, 1989). Therefore, the as-structure can be seen as reliant on our seeing the world as ready-to-hand. Further to this, the as-structure provides the intentional structure of something that is already understood regardless of whether it is expressed as a proposition or judgement (Doyon, 2015).

(2) Fore-structure: According to Heidegger, for interpretation to occur the as-structure must be made explicit or clarified and in order for this to occur there must be aspects that are already interpreted prior to the moment of actual interpretation (Gelven, 1989). Heidegger proposed that every interpretation is grounded in fore-structure. Fore-structure can be defined as prior awareness or what is known before interpretation (Gelven, 1989; Mackey, 2005; Tuohy, Cooney, Dowling, Murphy, & Sixsmith, 2013). Heidegger defines the three main elements of fore-structure as forUhaving, the understanding of the background context, fore-sight, part of what is usually known in advance and fore-conception, whereby one interprets the phenomena at hand (Gelven, 1989). Therefore, according to Heidegger, all understanding including historicality is connected to this set of fore-structures that are present in our interpretations (Laverty, 2003). It is important that we are aware of the presence of these interpretive influences as they cannot be eliminated from any interpretation (Laverty, 2003).
(3) Meaning: Meaning is achieved when understanding is made aware of the *as-structure*. For example, “when one understands the meaning of an act, one understands the act as that act-i.e. in terms of its purpose and use” (Gelven, 1989, p. 97). Therefore, when meaning is achieved through revealing the *as-structure*, the phenomenon is uncovered (Gelven, 1989). When the *as-structure* is made explicit in this way, the way a person makes use of the world can be said to be meaningful. Meaning can therefore be seen as a mode of being-in-the-world (Gelven, 1989).

### 3.1.3.4 Hermeneutic Circle

As mentioned previously, Heidegger believed that all understanding operates within the individual’s fore-structures which cannot be removed (Heidegger, 2010). As a consequence, there is a need to uncover these interpretive influences and account for them. Heidegger asserts that all interpretation is cyclical and this is achieved by moving from the parts of the experience to the whole and back again, to uncover the deep meanings of the text and increase the depth of engagement (Miles et al, 2013, Laverty, 2003). Heidegger believed that with each cycle a new level of understanding would be uncovered. It is this hermeneutic movement of *Dasein* that enables understanding to be elucidated (Heidegger, 2010, Taylor, 2013). In other words the hermeneutic circle is a method of interpreting and clarifying what the experiences are of being-in-the-world, making it possible to make sense of our everyday experiences (Miles, et.al., 2013).

### 3.1.4 Gadamer

Gadamer, a student and colleague of Heidegger, followed on from Heidegger’s work extending it in a more practical way (Laverty, 2003). For Gadamer, understanding and interpretation are inextricably linked. He asserted that
interpretation is a continually evolving process and therefore definitive interpretation is unattainable (Annells, 1996; Laverty, 2003). Furthermore, Gadamer suggests that hermeneutics is an attempt “to clarify the conditions in which understanding takes place” (1975. p.263). Gadamer viewed linguistics and understanding as inseparable aspects of being-in-the-world and proposed that the key to understanding is language (Annells, 1996; Laverty, 2003; Regan, 2012). He believed that language is the universal medium for understanding which facilitates interpretation (Laverty, 2003).

Gadamer further developed Heidegger’s notion of fore-structure by defining interpretation as a ‘fusion of horizons’ whereby the past and present engage in dialectical interaction. Gadamer proposed that the horizon is everything that can be seen from a particular vantage point and that questioning is an important part of the interpretive process to enable new horizons and understandings to be exposed (Laverty, 2003). Gadamer believed that fusion occurs when the historical horizon articulates with the present horizon of understandings (Annells, 1996).

Following on from Heidegger’s notion of the hermeneutic circle, Gadamer believed understanding is achieved by interpretation in a circular manner which creates a positive process to acquire new knowledge. This is achieved by moving from the whole to the parts and from the parts back to the whole (Debesay, Naden & Slettebo, 2008; Moules, 2002). Gadamer, highlighted the concept of prejudices as “a judgement that is given before all the elements that determine a situation have finally been examined” (Annells, 1996, p.707). He suggests that prejudices should
not be ignored but situated in our understanding. According to Gadamer, it is the recognition of the researcher’s prejudices that gives hermeneutics its real emphasis (Regan, 2012).

For Gadamer, understanding is self-understanding and if presuppositions remain unchallenged the interpretation of the text will be limited (Regan, 2012). This process requires the acknowledgment of the interpreter’s biases and preconceptions. This awareness enables the text to be interpreted without any unchallenged presuppositions (Regan, 2012). Therefore, according to Gadamer, to enable the interpreter to read a text they must have “an understanding of their own expectations about what a word or phrase means in relation to the parts and whole of meaning” (Regan, 2012, p.296).

3.1.5 van Manen’s Approach

A contemporary phenomenologist, educationalist Max van Manen, developed a method for phenomenological research that was informed by the descriptive phenomenological approach of Husserl and the hermeneutic phenomenological approaches of Heidegger and Gadamer. A distinct feature of van Manen’s phenomenology is its emphasis on pedagogy. He focussed the majority of his research career on improving pedagogy in a practical way with children, teachers and parents (Earle, 2010). This approach, according to van Manen, is especially relevant to the education, nursing and health care arenas (Sloane & Rowe, 2014). With this in mind, and its focus on practical ability, it appeared that this method was suitable to be used to guide this present study.
In his book, Researching Lived Experience (1990, 1997), van Manen, explained a human science approach to phenomenology. Following on from Gadamer, van Manen also focuses on language and being or existence within a historical and cultural context (Sloan & Bowe, 2014). For van Manen, the language of the interview provides the data for the methodological approach and the hermeneutic circle described by Heidegger and Gadamer provides the means for interpretation and understanding (Sloan and Bowe, 2014).

van Manen presented his text primarily as a methodology, as a set of methodological suggestions to enable the human science researcher to engage in research and writing (van Manen, 1997). van Manen’s approach is concerned with textual reflection on the lived experience and it focusses on practical actions of day to day life with the intent to expand one's thoughtfulness and practical resourcefulness (van Manen, 1997).

In van Manen’s view,

\textit{phenomenology describes how one orients to lived experience, hermeneutics describes how one interprets the "texts" of life, and semiotics is used here to develop a practical writing or linguistic approach to the method of phenomenology and hermeneutics} (1997, p.4).

In keeping within the tenets of hermeneutic phenomenology, van Manen (1997), believed that when engaging in phenomenological research it is not enough to merely recall experiences that the person or others have in respect to a particular phenomenon, instead, it is necessary to construct a possible interpretation of the
nature of the human experience. To aid in explication of the nature of hermeneutic phenomenological human science he presented his philosophical perceptions (1997, pp.8-13). Included within these are: explication of phenomena as they present themselves to consciousness; (ii) study of essences; (iii) description of the experiential meanings we live as we live them; (iv) human scientific study of phenomena; (v) attentive practice of thoughtfulness; (vi) search for what it means to be human; (vii) poeticizing activity; and (viii) study of lived experience.

van Manen asserted that while there is no distinct method inherent in phenomenology it does have a certain methods-a way (van Manen 1997, p.29). This methods-a way can be described as a "tradition, a body of knowledge and insights, a history of lives of thinkers and authors, which, taken as an example, constitutes both a source and a methodological ground for present human science research practices" (van Manen, 1997, p.30). According to van Manen (1997), hermeneutic phenomenological research is complex and although the focus is to create a full interpretive description of the lifeworld, the researcher must remain aware that lived life is always more multifaceted than any explication of meaning can uncover (van Manen, 1997).

For van Manen (1997) we may have many different lifeworlds depending on the circumstances and the particular environment we find ourselves in at the time. The basics of our lifeworld are articulated as preverbal and difficult to describe. These basics or existential themes are described as the experience of lived time, lived space, lived body, and lived human relation (van Manen, 1997). These existentials
relate to the lifeworld of all human beings regardless of their background. Moreover, van Manen uses these existentials as a guide for phenomenological questioning, reflection and writing throughout the research process (van Manen & Adams, 2010, van Manen, 1997).

The existential of lived space is concerned with how the person feels in the particular space they find themselves in, whether it inhibits or facilitates behaviour. Generally, lived space is the "existential theme that refers us to the world or landscape in which human beings move and find themselves at home" (van Manen, 1997, p. 102). Lived space can affect how we feel but is something that is often pre-verbal and it is hard to find words to describe it. However, often when we want to find out information or have understanding of a person’s background we often ask about their home and where they were born to elicit more information. Lived space can be both objective and subjective and is a method of inquiring into how we experience the affairs of our everyday existence (van Manen, 1997). In relation to this study lived space was considered to aid in understanding of the participants’ experiences of the high fidelity simulation program and the high fidelity simulation spaces.

Lived time or temporality can be described as the subjective experience of time rather than the objective measurable time of clocks and calendars (van Manen, 1997). It refers to the changing nature of time which is influenced by our personal experience. Time can be experienced as passing slowly for an individual who is bored or anxious. On the other hand, in circumstances where the individual may be enjoying themselves it may appear to pass extremely quickly
Temporality is central to the notion of being and reflects the persons past, present and future. Temporality constitutes the horizons of a “person's temporal landscape” (van Manen, 1997, p. 104). Time or temporality in this study is important in understanding the lived experiences of the participants as their past as nurse academics would be expected to have an impact on the present and the future within the introduction and adoption of the high fidelity simulation program. This study is influenced by temporality as it was carried out over a three year period.

The existential of lived body or corporeality is concerned with the fact that we are embodied or always bodily in the world. According to van Manen (1990, p. 104), the way we use our bodies differs when we are alone to when we perceive someone to be watching us. In our bodily presence we both reveal and hide something at the same time, however, the lived body is how we experience our bodies (van Manen, 1997).

Lived human relations or relationality is the existential concerned with the way we react to others within a shared interpersonal space. It is the way one engages with others and the manner in which that engagement is experienced (van Manen, 1997). For Heidegger, a human being is not an isolated, wordless subject but a person living in a world and created by that world. He believed that our everyday life is constituted by our dealings with and our understanding of other human beings and ourselves (Frede, 2006). According to Heidegger, being-in is being-with others which is fundamental to our lived experiences (Heidegger, 2010). The concept of lived human relations is integral to the study of the phenomenon of
nurse academics introducing, adopting and implementing a high fidelity simulation program. For the participants, being-with was with other nurse academics, technical staff, students and senior management within the School of Nursing and Midwifery.

van Manen (1997) asserted that all four existentials are intricately related to form our lifeworld. He contended that the four can be differentiated but not separated. However, in van Manen’s view, in a research study, the existentials can be temporarily examined separately but the researcher must be aware that one existential always calls forward the others (van Manen, 1997).

3.2 Summary

In this chapter the philosophical framework used to inform this study was discussed. Phenomenology was described as the science of a phenomena and the study of the lifeworld. Husserl was acknowledged as the founder of the modern phenomenological movement with his focus on intentionality, essences and phenomenological reduction. He believed that phenomenological reduction was imperative to achieve validity or objectivity of interpretation. Heidegger disagreed with Husserl’s epistemological focus presenting a more existentially oriented phenomenology with an ontological focus. Hermeneutic phenomenology, as described by Heidegger centred on the notion of being which he believed was the most universal concept, calling it Dasein. Dasein encapsulates the situated meaning of human beings in the world. Heidegger believed that Dasein is located in history and temporality denotes an awareness of time through the person’s experiences of being in time. Dasein is concerned with the past, the present and sees the future as consisting of its own possibilities. Heidegger asserted that understanding is the basic
form of existence and that central to the process of understanding is interpretation. He suggested that there are three basic considerations related to interpretation, the as structure, fore-structure and meaning. However, all meaning operates within the fore-structure. Heidegger proposed the hermeneutic circle where all interpretation is cyclical moving from the parts of experience to the whole and back again.

Gadamer extended Heidegger’s work in a more practical manner and proposed the key to understanding is language. He presented the notion of a fusion of horizons whereby there is interplay between the past and the present in a circular manner to acquire new knowledge. He highlighted the notion that prejudices should not be ignored but recognised to enable true understanding.

The final phenomenologist examined in this chapter was Max van Manen, a contemporary educationalist with a focus on pedagogy. van Manen was influenced by the writings of Husserl, Heidegger and Gadamer and proposed a set of methodological suggestions to assist the human science researcher to engage in research and writing. He asserted that there are many different lifeworlds depending on circumstances and that the basics of our lifeworld can be articulated as lived time, lived body, lived space and lived human relation.

After careful consideration of the research question hermeneutic phenomenology was found to be an appropriate ‘fit’ for this research study as the aim of the study was to uncover the lived experiences of nurse academics being- in- the- world of the introduction, adoption and implementation of a high fidelity simulation program. In the next chapter the method followed in the study will be addressed.
Chapter Four: RESEARCH METHODOLOGY

In the previous chapter the philosophical framework that informed the study was outlined and concepts related to phenomenology, hermeneutics and hermeneutic phenomenology were presented. In this chapter, the methods used in this study are discussed and van Manen’s six activities that guide the hermeneutic phenomenological approach to the research are articulated. A discussion of the trustworthiness of the research concludes the chapter.

4.1 Research process

This study was conducted in two stages, with the first interviews conducted within three months of the implementation of the high fidelity simulation program. The second stage of the study was conducted three years later. The rationale for the initial interviews in the early stages of the high fidelity simulation program was to enable insight into the lived experiences of participants at the outset of the program. The three year interval between the first and second stages was to allow time for the development of the participants’ lived experiences across the three years of the pre-registration program. It was anticipated that this would enable the participants to have time to explore and expand their understanding of the phenomenon, providing increased depth and richness to the findings of this study.

4.2 Participant selection

The selection of participants was guided by the aim of my study. This study sought to uncover the lived experiences of nurse academics when introducing, adopting
and implementing a high fidelity simulation program in a School of Nursing and Midwifery at a large university in Australia. The School of Nursing and Midwifery was situated on three separate campuses. Therefore, a purposive sample was selected to ensure that the participants involved were nurse academics who had experience with the phenomenon and would be able to articulate their journey. This method was a relevant choice for the study as purposive sampling is suggested to be effective when the researcher requires participants that can inform and provide a fit with the study’s aims, goals and purposes (Bazeley, 2013; Tracy, 2012).

In qualitative research there is no set sample size, rather, it is the method of selection or fit for the purpose of the study and the quality of the data obtained that is important (Morse, Barrett, Mayan, Olson, & Spiers, 2008). Therefore, data collection in hermeneutic phenomenological research is considered to be sufficient when the researcher is able to construct a deep and rich interpretation of the phenomenon (van Manen, 1997). In this study, data was collected until the elements of the participant’s stories sounded familiar and I felt that the data was rich enough to enable me to develop depth in my interpretation of the phenomenon. Data saturation was reached at ten participants in stage one. Despite the fact that not all participants continued in the second stage of the study, five participants was enough to provide rich data to enable depth of interpretation and reach data saturation in the second phase of the study.

### 4.2.1 Recruitment of participants

Participant recruitment was initially performed by distributing information flyers in the staff tea rooms at the School of Nursing and Midwifery at each of the three
campuses. A brief explanation of the research study was included in the flyer and participation of nurse academics involved in the introduction, adoption and implementation of the high fidelity simulation program in the nursing practice units of study, was requested. My email details were also documented on the flyer. The response rate to the recruitment flyer was poor with only one nurse academic responding via email with an expression of interest to join the study. Following this poor response, I advertised a morning tea, information recruitment session by a flyer placed on the tea room noticeboard of each of the three campuses. Each session attracted between five to six participants. Information sheets were given out at the information session detailing the eligibility criteria and an explanation of the project with my details outlining my status as a doctoral student and a contact email address (see appendix 3). The nurse academics that attended these sessions also offered to pass on the information sheets to other nurse academics involved in the high fidelity simulation program that were not in attendance. This word of mouth, known as snowballing, also assisted with the recruitment process. Following the information sessions, the interested participants then emailed me indicating their willingness to volunteer as participants in the study. A total of ten nurse academics that were eligible for the study volunteered as participants for stage one.

The participant’s roles within the high fidelity simulation program were diverse (see table 1). Two participants were directly involved in the introduction of the program with a designated role of academic advisor for the simulation program. One academic advisor followed on in the role from the original advisor when she moved to a more senior position of coordinator of clinical education. The remaining participants were nurse academics within the program and their employment status
varied from full time tenured academics, academics on fixed term contracts and academics on casual contracts who were employed on a one semester basis. It must be noted, that none of the participants who volunteered for the study were coordinators of units of study where the high fidelity learning exercises would be implemented, even though a number of the participants discussed the study with them. A number of the participants were responsible and coordinated other units of study, but not in the nursing practice units where the high fidelity simulation program was implemented. There was an attrition rate of five (5) participants in stage two of the study related to the diversity of the nurse academic workforce. This reduction in participant numbers can be attributed to two casual staff members being no longer employed at the university, one staff member no longer teaching in the area, one being on maternity leave and the fifth staff member opted out of the second stage of the study.

### 4.2.2 The participants

Each participant was given a pseudonym to maintain confidentiality. All participant volunteers for the study were female. Both genders were invited to participate; however, there were no male volunteers. A written demographic sheet was given to each participant at their interview session seeking information about their age, years of clinical skills teaching in a university setting, years of experience using high fidelity simulation learning and their employment status. The ages of the ten participants ranged from 30-65 years. Eight of the nurse academics had at least five or more years’ experience in clinical skills teaching. Three participants possessed teaching experience which ranged between three to five years and two participants were new to the area of clinical teaching with zero to two years’ experience. When considering experience with high fidelity simulation learning one participant had
between three to five years of experience and the remaining participants had minimal experience that ranged from zero to two (2) years. Five out of the ten participants were employed full time and had a permanent tenured position at the university. Two participants had fixed term contracts and the remaining three participants were employed on a casual basis.

Each of the participants will be introduced in the following table:

**Table 1 Participant demographics**

<table>
<thead>
<tr>
<th>Participant pseudonym</th>
<th>Age range</th>
<th>Years of experience in clinical skills teaching</th>
<th>Previous experience using high fidelity</th>
<th>Employment status</th>
<th>Stage One</th>
<th>Stage Two</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sue</td>
<td>45-55</td>
<td>3-5 years</td>
<td>0-2 years</td>
<td>Tenure</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2. Jane</td>
<td>30-45</td>
<td>3-5 years</td>
<td>0-2 years</td>
<td>Tenure</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3. Michelle</td>
<td>45-55</td>
<td>5 years+</td>
<td>0-2 years</td>
<td>Tenure</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>4. Priscilla</td>
<td>30-45</td>
<td>3-5 years</td>
<td>3-5 years</td>
<td>Casual</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>5. Sarah</td>
<td>45-55</td>
<td>5 years+</td>
<td>0-2 years</td>
<td>Tenure</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6. Lisa</td>
<td>30-45</td>
<td>5 years+</td>
<td>0-2 years</td>
<td>Fixed term Contract</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>7. Vanessa</td>
<td>30-45</td>
<td>0-2 years</td>
<td>0-2 years</td>
<td>Casual</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>8. Carol</td>
<td>55-65</td>
<td>5 years+</td>
<td>0-2 years</td>
<td>Tenure</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>9. Elizabeth</td>
<td>30-45</td>
<td>5 years+</td>
<td>0-2 years</td>
<td>Fixed term contract</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>10. Jacqueline</td>
<td>30-45</td>
<td>0-2 years</td>
<td>0-2 years</td>
<td>Casual</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
4.3 Data collection

The use of in depth face-to-face interviews to uncover the lived experiences of the participants is congruent with the hermeneutic phenomenological approach used in this study. The interviews took the form of a shared conversation, however, semi structured questions were prepared to guide the conversation (see appendix 4). The interviews commenced with general statements such as ‘tell me about your thoughts on high fidelity simulation’... ‘I am interested in how the introduction of a high fidelity simulation program has been for you’. van Manen (1997), contends that the interviewer must remember the focus and the fundamental question that prompted the interview at the outset otherwise the interviewer can lose their way.

The setting for the participant interviews was on the campus that was the participant’s place of work. They were held in a private room such as the participant’s office or a private meeting room. The participant interviews were performed at a time and place convenient for the participants and each interview was audio recorded. The duration of each interview was between 40-60 minutes. Communication techniques such as paraphrasing, summarizing and clarifying statements were used in the interviews to ensure my understanding of the participant’s narrative. I was aware of my own pre understandings and experiences and made sure that I kept the focus on uncovering the meaning of the phenomenon. Following each interview, I made notes in my journal regarding the non-verbal interactions that had occurred during the interview. For example when one participant was discussing the lack of progress in the implementation of the program three years later I noted in my journal her ‘slumped posture and
despondent facial expression’. The audio taped interviews were transcribed into a word document verbatim. The transcriptions were then listened to in order to check each word for accuracy and any silences or vocal sounds were also noted to assist with the interpretation of the data.

4.4 Data analysis

The data was then analysed using van Manen’s (1997) proposed six dynamic methodological themes or features. These themes are designed to enable the researcher to develop appropriate research methods, data collection techniques and procedures. The themes include: focusing on a phenomenon of interest which commits us to the world; investigating experience as it is lived; reflecting on essential themes which characterize the phenomenon; describing the phenomenon through the art of writing and rewriting; maintaining a strong and oriented pedagogical relation to the phenomenon; and balancing the research context by considering parts and whole (extracted from van Manen, 1990, pp.30-31). The interplay of these methodological themes is dynamic and does not necessarily need to be followed in a sequential manner. With this in mind, the six activities that were used as a structural guide for this study will be discussed:

4.4.1 Turning to the nature of the lived experience

van Manen (1997), asserts that the lived experience is the beginning point and the end point of phenomenological research. The aim is to transform lived experiences into a textual representation by uncovering its essences in a meaningful reflective way. The term essence can be identified as a description of a phenomenon. Lived experiences gain hermeneutic significance “as we (reflectively) gather them by giving memory to them” (van Manen, 1997, p. 37).
According to van Manen (1997), a phenomenological concern always has dual characteristics; a preoccupation with the ontic as well as the ontological nature of a phenomenon. Therefore, it is important to keep this in mind when determining an appropriate topic for phenomenological inquiry. For me, the process of orienting to the phenomenon was time consuming, thoughtful and reflective. I knew that due to my background as a nurse academic with considerable experience in clinical nurse education and experience with varying levels of simulation that I was deeply interested in the topic of simulation within nursing. Therefore, my lived experience was relevant to the project as it was an area that I was passionate about. This does not mean that I was so engulfed in my own experiences that I would be unable to explore experience of others. van Manen (1997) suggests that it is better to explicate our preconceived understandings, biases, assumptions and theories in order that their influence can be noted. Accordingly, I have described in chapter one the factors that influenced me when turning to the nature of the lived experience. Integral to this process is maintaining openness through discussions, readings and reflections to the phenomenon of interest (Taylor, 2013).

4.4.2 Investigating experience as we live it

In this section, the emphasis is on researching experiences as lived by participants. According to van Manen (1997), in order to make a study of the lived experience it is important to orientate oneself to the question of meaning of the phenomenon in question. Prior to the participant interviews, I reflected on my personal experiences as a starting point followed by the aims of the study, the research question and also formulated a number of open ended guiding questions. In stage one, ten participants were interviewed with an emphasis on their lived experiences. This was followed by stage two where five of the original participants engaged in follow
up interviews three years later. The format of the interviews was spontaneous and free flowing to allow the participants to describe their experiences. The interviews were audiotaped and transcripts were individually checked to ensure accuracy. A combination of oral descriptions from the participants, and field notes (journal entries) taken upon completion of each interview, form the basis of the textual analysis in this study. In addition I performed literature searches and read other literature relating to nurse academic experiences within high fidelity simulation programs. The participant’s personal experiences, my field notes (journal entries) and pertinent readings were used to understand the lived experiences of the participants.

4.4.3 Reflecting on the essential themes which characterise the phenomenon

The purpose of reflection in van Manen’s method is to uncover the essential meaning of the phenomenon. It is where the researcher starts to make sense of the collected information to enable insight into the essence of the phenomenon (Taylor, 2013). It is important at this stage that the researcher maintains an orientation towards the aims and objectives of the study. The explication of the meaning of the text can be accomplished through analysis of themes. According to van Manen (1997), phenomenological themes can be understood as the structures of experience and when analysing a phenomenon the focus is on determining what the structures are that make up that experience. The term theme analysis or thematic analysis refers to “the process of recovering the theme or themes that are embodied and dramatized in the evolving meaning and imagery of the work” (van Manen, 1997, p.78). In hermeneutic phenomenological research a theme should uncover the essence of the lived experience.
In this study, I commenced analysis by immersing myself in the textual transcripts from the first ten interviews. These interviews were from stage one of the study and I listened to the audiotapes of the interviews and read and re-read the transcripts. At this stage I was able to get an overall feel for the text and identify my preconceptions or biases prior to analysis to enable openness to the participant's descriptions. The suggestions by van Manen (1997) for isolating thematic elements of a phenomenon in a text were then used. Firstly, I used the wholistic sentitious approach to capture the main significance of the text. Upon reading the text again words and phrases that were particularly relevant were highlighted and also documented on large sheets of paper and in my journal. The text was then examined line by line focusing on the nature and meaning of the phenomenon. I then listened to the audiotapes again to develop further meaning.

As a result of these activities, I started to develop a sense or pattern of meaning of the lived experiences of the participants. I had words and phrases and was able to commence formulating beginning minor and major themes which seemed to capture something important about the participant's experiences in the introduction, implementation and adoption of the high fidelity program. There were some themes that emerged with commonalities and others at this stage appeared isolated. Throughout this process, insightful comments were also documented in my journal for further reference. I also engaged in discussions with my supervisors which enabled me to further develop my ideas and also increase clarity with my developing themes. Hermeneutic conversations with colleagues also assisted as an informal method of collaborative assistance in the development of themes.
Other methods suggested by van Manen (1997) were also used to assist with the illumination of meaning hidden within the participant’s experiences. These include tracing the etymological sources of key words; searching for idiomatic phrases; finding inspiration in art and literature, and reading accounts of other phenomenological studies, such as a hermeneutic phenomenological paper by Miles et al. (2013) and Jayde, Boughton, and Blomfield’s (2013) phenomenological study using van Manen’s method.

Stage two of the study was implemented three years after the initial interviews had been conducted. At this stage the major and minor themes from stage one had been uncovered and assisted in the focus for the development of semi-structured questions for stage two. Five participants were re-interviewed and prior to the interviews the participants were provided with pre-reflective anecdotes and an overview of their narratives from stage one. This assisted in refreshing their memory and also provided them with an opportunity to discuss and clarify any misconceptions from their prior interview. The process of hermeneutic phenomenological reflection was repeated in stage two of the study.

4.4.4 Describing the phenomenon through the art of writing and rewriting

According to van Manen (1997), the role of language and writing in phenomenological interpretation is critical. He believed that “to do justice to the fullness and ambiguity of the experience of the lifeworld, writing may turn into a complex process of rewriting (re-thinking, re-reflecting, re-cognizing)” (van Manen, 1997, p.131). In this study writing commenced at the time of the interviews with note writing in my journal in regards to my thoughts and perceptions from the
interviews and any nuances that I had observed. As I listened to the audiotapes, I made notes and read and re-read the transcripts making paper notes and also e-notes. I then wrote and rewrote until the essences of the participant’s experiences began to emerge. I then went back and forth from my initial interpretation to the transcripts to ensure that my data extraction was comprehensive. The process of writing and rewriting with further interpretation continued until I was satisfied with the nature and meaning of the phenomenon. I was engaging in what Heidegger termed the hermeneutic circle (Heidegger, 2010).

4.4.5 Maintaining a strong and oriented pedagogical relation to the phenomenon

In this study the research question, the aim of the study and the philosophical framework guided the process of data collection, analysis and interpretation. According to van Manen (1997) the text needs to be rich and have depth and the researcher must remain strong in their orientation to the fundamental question. I maintained this orientation by reading broadly but also keeping a focus on the research question and ensuring that the depth of analysis was strong by following van Manen’s six activities.

4.4.6 Balancing the research context between the parts and whole

van Manen (1997) proposed the importance of the overall design must be tested against the role the parts play in the overall design. He suggests that it is important to step back to look at the total work and how each of the parts contribute. In this study the text was examined from a number of angles to ensure that the whole experience was covered. This process was ongoing and allowed me to slowly develop a new text that incorporated meaning and descriptions as I had interpreted
them. van Manen (1997) suggests that regardless of the approach to interpretation, research is an original activity. I have presented my interpretations in this study in a way that other readers may understand the context and experience the essence of the phenomenon. However, according to Gadamer, interpretation is an evolving process and therefore a definitive interpretation is not possible (Annells, 1996).

4.5 Ethical considerations

It is important for the researcher when conducting human science research to be cognisant of the ethical responsibilities inherent in the research process. Prior to commencing this study, ethics approval was obtained from the human research ethics committee at the University of Western Sydney (see appendices 1 & 2). Throughout the three year period of the study, ethics approval was maintained by providing an annual report to the human research ethics committee.

I conducted this research study with the welfare of the research participants in mind at all times, making sure that I upheld my ethical responsibilities. The participants were all given a participant information sheet and a consent form (see appendix 3). Informed consent was obtained from each participant prior to all interviews. At the commencement of the interview, time was allowed for discussion and rapport building with each participant, and this time also provided the participants with an opportunity to ask any further questions related to the study. The participants also gave consent for the interviews to be audiotaped. Participants were informed that they could withdraw from the research study at any time without prejudice or penalty.
Confidentiality and privacy of the participants information was addressed in the following manner: all participants were provided with a pseudonym and this was used on all transcriptions; consent forms were stored separately; data was stored on a password protected computer and in a locked filing cabinet in the principal researcher’s office to be destroyed five years after completing the study; audiotapes were transcribed by a transcriptionist with confidentiality inherent in their work practices; and participants were informed of their right to choose to have sections of their text omitted from the research if they so indicated. This situation occurred when interviewing participants a small number of times. The participant asked not to be quoted on part of their narrative and the section was then removed from the transcriptions.

In regards to the comfort of the participants, I was particularly aware that the exploration of their lived experiences in the introduction, adoption and implementation of the high fidelity program in the participant’s work place may elicit a number of different emotions from the individuals. The exploration of their experiences with regards to pedagogical issues was paramount and also highly sensitive and so it was extremely important to reassure the participants that they would not be identifiable in any way from the research findings. To facilitate feelings of comfort, the interviews took on a shared conversational approach in a venue of the participant’s choice in a private location and the participants were informed that they could terminate the conversation at any time. The participants were also informed of the support of the university’s counselling service if they experienced any feelings of emotional discomfort following the interviews. There
were no incidences of emotional discomfort identified by the participants throughout the interview process.

4.6 Trustworthiness of the research

Research conducted in the qualitative paradigm is marked by a richness and variety of theoretical constructs, data sources contexts and samples (Tracy, 2010). It has been argued that during the conduct of inquiry, qualitative researchers should implement actions that ensure rigor throughout the research process rather than once the study has been completed (Morse et al., 2008). Issues of trustworthiness of the research process will be outlined in this section using Tracy’s (2010) criteria for conducting qualitative research as a guide.

According to Tracy, the first aspect of quality quantitative research is worthiness of the topic. She asserts that worthiness of a topic can be established because “they reveal an aspect of life that has been overlooked, misunderstood, mistaken, or because they provoke transformation or elicit emotion in the reader” (2012, p.231). In this study worthiness of the topic has been established in the introductory chapter.

Rich Rigor refers to the quality of the research process (Tracy, 2012). Firstly an exploration of the philosophical framework of the research is undertaken to ensure philosophical integration of the philosophy throughout the research process. The level of ontology of the phenomenon needed to be explored along with the fittingness of the method used. In this study, the method used was congruent with the philosophical tenets which allowed me to meet my aims and answer the
research question. Hermeneutic phenomenology is integrated throughout the analysis and findings of this study.

Sincerity is described by Tracey (2010) as research that is marked by honesty and transparency in regards to the researcher’s biases, goals and difficulties and how this impacted on the research study. In this study my pre-understandings and beliefs that I brought to the study were made explicit. In the introductory chapter, I outlined my history as a nurse academic with experience in simulation learning. My lived experience, I believe, assisted me in connecting with the participant’s experiences of the phenomenon throughout their interviews. I engaged in ongoing self-reflection throughout the research process and also reflected following each interview, writing notes in my journal. I feel that this form of reflection enhanced my ability to understand my own values and assisted me with interpretation of the participant’s narratives. My change in understandings evolved as I continually drafted and redrafted throughout the interpretive phase to gain greater understanding of the interview texts.

Credibility relates to the trustworthiness and plausibility of the research process (Tracy, 2012). The credibility of the study was enhanced by the rich descriptions given by the participants. The analysis of the data was enhanced by the integration of quotes and exemplars to support the findings. The participant sample can be considered appropriate as all participants were connected to the phenomenon as a result of their lived experience (Morse et al., 2008). This ensured rich and relevant data. A systematic audit trail was kept from the commencement of the study which
consisted of transcription files, personal files such as a written journal, e journal and thematic analysis files.

Resonance, according to Tracy (2012) is considered to be the “feature of the text that meaningfully reverberates and impacts an audience” (p.238). The concept of transferability is one way that has been asserted that resonance can be achieved. Transferability can be identified when the reader believes that the research findings fit with something significant in their world and they can find meaning in the researchers interpretations (Moules, 2002; Tracy, 2012). The experience should resonate with the reader to enable them to understand the lived experiences for the participants in that context (Tracy, 2012). It has also been suggested by Tracy (2012) that aesthetic merit is another aspect of resonance whereby the reader is emotionally affected by the aesthetic merit of the text.

4.7 Conclusion

In this chapter an overview of the research processes used to complete the study using a hermeneutic phenomenological framework has been provided. The processes prior to data collection, the method of data collection and the process of hermeneutic phenomenological data analysis and interpretation have been comprehensively described. Although the process appears linear in this section, the research process was a circular process whereby my engagement moved from the parts to the whole again and again in order to achieve clarity of the phenomenon of investigation.

In the following chapter the findings of the study which emerged from the thematic analysis will be presented.
Chapter 5: FINDINGS STAGE ONE

In this chapter the findings from stage one of the study will be presented. I have reflected in depth on ten conversational interviews with the participants in stage one of the study to explicate the lived experiences of nurse academics when introducing, adopting and implementing a high fidelity simulation program in a pre-registration nursing program. This hermeneutic reflection uncovered rich and meaningful data that gave insights into the participants’ experiences. Throughout the process of making sense of the phenomenon two major themes, with sub themes and minor themes emerged to illuminate their experiences and these are presented in this chapter.

Quotations from the transcribed narratives of the participants have been included throughout the findings chapters to provide a lens for the reader to connect with the lived experiences of the participants and give them a voice. To enable the reader to identify and connect with the participants, they are referred to by their pseudonyms: Sarah, Jane, Lisa, Bridget, Carol, Priscilla, Sue, Vanessa, Jacqueline and Michelle.

The two major themes identified for the first stage are: Being-in-the-world of imposed change and Being-in-the-world of implementing a new program. Five sub themes and two minor themes emerged from the two major themes (Figure 2).
5.2 Being-in-the-world of imposed change.

The first major theme to emerge from the experiences of the participants was being-in-the-world of imposed change. The participants described the introduction of the high fidelity simulation program in ways that made it apparent that this new program was imposed on them from a senior management level. The participants clearly articulated their feelings of lack of knowledge related to high fidelity simulation, lack of control in the decision-making process and a distinct lack of connection and meaning with the introduction of this new program.

Two subthemes emerged from the participants’ experiences and they will be discussed in this chapter. The first sub theme was feeling disconnected. The participants felt disconnected from the program as they were not consulted or
involved in any of the decision making related to the initiation of the high fidelity simulation program. They felt excluded from the dialogue that had occurred at the senior management level and believed that they were not given sufficient rationale for the introduction of a high fidelity simulation program. At the time of the stage one interviews, simulated learning activities were not embedded into the curriculum document in the pre-registration nursing program.

The second subtheme *feeling underprepared* illustrated the feelings of lack of preparedness from the participants, as very few of them had any prior experience with high fidelity simulation and were unaware of its possibilities as a teaching and learning strategy. In addition, alteration and upgrading of the existing nursing laboratory environment was necessary to accommodate the high fidelity simulator (HFS). Two of the participants who were alienated from the decision making process were allocated the task of overseeing the implementation of the building and incorporation of the audio visual equipment. Both of these participants had minimal experience with this new technology.

### 5.2.1 Feeling disconnected

All participants when discussing the introduction of the high fidelity simulation learning program into the nursing practice units voiced feelings of exclusion from the decision making process. They identified that the motivation for the program was totally out of their control and driven by one senior member of staff.

Sarah, who was allocated the role of academic advisor for clinical education, provides the background to the introduction of the program in the following statement:
The original plan was from a previous [coordinator of clinical education] that we had. We went through some rebuilding of our [nursing] practice unit ... this previous [coordinator] said well, we need simulation. She went to a lot of ... conferences. When she was overseas and things, she visited simulation centres. She visited the centre in Brisbane

It is evident from this quote, that Sarah had no part in the decision making process for the introduction and adoption of simulation learning activities within the nursing program, clearly outlining that the impetus came from one senior staff member. Similarly, Carol an experienced lecturer in the area of nursing practice, felt totally detached and disconnected from the process due to the lack of dialogue between senior management and the academic staff responsible for implementing and teaching in the program. She commented:

We were delivered a box, somebody decided, you know, no consultation with anybody actually at the coal face, no teaching at all, just somebody decided to do this.

Carol indicated a lack of connection and planning between the purchasing of the high fidelity equipment by management and the operationalisation and transfer of information to staff. This is highlighted by the lack of use of the high fidelity simulation mannequin for a number of years because the staff did not know how to use it. Carol’s frustration is uncovered in the following quote:
Priscilla, a casual lecturer with previous experience in the area of high fidelity simulation, concurred with Carol, outlining that SimMan® had remained in a box unused for three years at the campus where she was teaching. She spoke of her experiences with a sense of detachment, as an observer rather than as a person immersed in the process. She perceived a distinct lack of organisation and planning prior to the purchasing of the high fidelity equipment. She commented:

*They haven’t thought everything through and they spent a lot of money on stuff that they're doubling up on and all that stuff that's inappropriate. I think that comes down to, as I said, lack of organisation. They’ve just got all this money, and they go, okay, we need this, this, this and this but they haven’t actually sat down - or to me doesn’t look like they sat down and thought about what they actually needed and how are they going to use it. So as far as I know, I was the first person to use the Sim Man last year ... it had been sitting there for three years.*

Priscilla shared her feelings of frustration with the lack of planning, organisation and communication between management and nurse academics in the following comment:
........ so if you ask me what the brief was there was no brief. It was just sitting there...

Jacqueline, a new member of staff on a fixed term contract and Bridget, a casual staff member, stated that the first time they became aware of the program was when they were sent an email to attend an in-service education session in relation to an introduction to high fidelity simulation. They suggested that they had no connection with the introduction of the program.

The senior staff member who had the vision for the program left the University before implementation. The second in charge, Sarah, who was the academic advisor for clinical education at the time, took charge of the project half way through its development. Sarah felt isolated and disconnected from the program as she had no initial input into its adoption.

She [the previous coordinator] had a vision in mind of what it would be and the specs for the building [they] were all her specs. Not having so many video cameras, not having this and that in it. So she was the one that had the original thoughts to it.

Then I came on board as a [academic advisor] at the time and what that involved was my role was to deal with the nursing labs and simulation. So I came on board half-way through basically. So I was then involved in the setting up of the sim lab as well. So they built it. The room was there, but they hadn’t fitted it out yet.
Sarah had not had any previous experience with high fidelity simulation and found it very challenging when making decisions about the construction of the high fidelity simulation laboratories. The set up required not only the physical space to accommodate the highly technical mannequin (SimMan®) but also the control room, the viewing rooms and sophisticated audio-visual equipment. Approximately six months later, Jane was appointed as the new academic advisor for clinical education to assist with the development of the program. Jane also had no previous experience with high fidelity simulation programs. Jane indicated her feelings of disconnection with the building process when she took over more than half way through and it became her role to supervise this process:

So I’m taking over someone’s house to rebuild. That’s what it is like. I wasn’t involved in any of the discussions with the setup of the simulation. I’ve taken over and fixing the problems. So it’s been a very big headache. I don’t have a relationship with the builders. I don’t have a relationship with the audio people.

Jane revealed feelings of dismay and frustration when discussing the lack of planning and vision from management after receiving substantial funding for the building of the facility for high fidelity simulation. She commented:

... [the previous head of school] got all this money. So they run, without any type of business plan...all the literature tells you need a business plan before you build these things
Jane’s dismay is further illuminated when she was asked about the presence of an educational plan prior to the introduction and adoption of the high fidelity simulation program. She replied:

*No, there was nothing. It was just built...but that’s how it came to me. I just have to do the best I can and have it running the best I can.*

Jane’s quote depicted disillusionment at the lack of prior planning and vision for the program. However, she felt that it was now her role to show leadership under these circumstances.

A number of the participants believed that certain aspects of the layout of the high fidelity simulation laboratory and the positioning of equipment was not always correct. The participants identified problems such as large monitor screens in the SimMan® room with no purpose and a limitation with SimMan®’s capability as the talking function was not enabled. In addition, the control room was fitted with clear glass instead of a one way mirror so that the operators would be visible and hence a distraction for the students in the simulation exercises. The participants did not express their opinions at this time as there was no consultative forum established between the academic staff and management. The participants’ perceptions were that the change was imposed on them from a more senior level which left them feeling that they did not have a voice in the process.

Priscilla, who had previous experience using high fidelity simulation at another university felt undervalued and excluded, as her expertise and knowledge was not
utilised. When asked about her level of involvement she replied: not much unfortunately...they haven’t involved me in any way at all

In addition, Priscilla strongly believed that there were wasted resources in the simulation laboratory but she felt powerless to raise her concerns as her expertise was not asked for and therefore felt very little connection with the introduction of the program. She commented:

*there’s a big TV screen in the simulation lab and I don’t see the point of it...So to me, that’s wasted. Finances could have been spent on something - even a task trainer which would have been more appropriate for our setting as opposed to these big massive TVs...They haven’t thought everything through and they spent a lot of money on stuff that they’re doubling up on and all that stuff that’s inappropriate.*

Summary:

It became clear from the lived experiences of the participants that the high fidelity simulation program was imposed from senior management and, as a consequence, the participants felt disconnected and powerless to offer any opinions. A number of participants were distressed that SimMan® was delivered in a box and remained unopened for up to three years. From the outset of the program, the majority of the participants were naive to the possibilities a high fidelity simulation program could offer as a teaching and learning initiative for pre-registration nursing students. In addition, one participant had previous experience with high fidelity simulation however, her expertise was not utilised. The majority of the participants
had minimal knowledge of the technological capabilities of the mannequin (SimMan®) and as a result, the implementation of the high fidelity program at the time of the first interviews was limited.

5.2.2 Feeling underprepared

The second sub theme illustrated the participant’s feelings of being underprepared for the introduction of this new program. The majority of participants had not received any prior education in the use of high fidelity simulation technology as a teaching and learning tool and, as a consequence, a heightened sense of anxiety was experienced by many of them.

Sarah, the academic advisor for clinical education at the time of the introduction of the high fidelity simulation program, highlighted her lack of education and expertise in this area. She commented:

I was no expert. Yes. So it was difficult. I found some things later to help. I also went to a - like a symposium workshop ... and for some meetings. I found out what I didn’t - oh, I should have done that. I should have done that.

She found that she had to quickly engage with the simulation literature and the simulation community to enable her to function at a beginning level. Following on from Sarah’s lead, a small number of interested staff attended external workshops
in simulation which provided beginning level knowledge in the use of high fidelity simulation. Sarah commented:

Well, one of them was … [an advisor for clinical education]. She was teaching so that’s alright, because she had already been to a [Sim Health] conference and … About two or three had previously been to the sessions that we’ve had. They are actually really interested in simulation. So they’ve been to previous workshops [another university] ran a one day workshop. An introduction to simulation … and some of them went to that.

However, Sarah encountered difficulties with the educational preparation of the nurse academics in the broader School of Nursing and Midwifery community. She found that she would advertise workshops but very few academics would attend. She felt that the problem was exacerbated due to the large numbers of casual staff teaching in the nursing practice units. For Sarah, this lack of engagement created a strong sense of frustration which culminated in her individually contacting each staff member teaching in the program in the hope that they would participate in the preparation:

Now we have staff. 80 academics. 3 will turn up. So I thought right, most of the people we’ve got teaching are casual…it’s very difficult to catch up and permanent staff are difficult to catch anyway because they don’t turn up to these things. So that’s why I individually contacted each staff member, looked at their timetables, their individual timetables….sometimes I was
Vanessa, a casual lecturer, also believed that the large casual teaching workforce was a barrier to staff attendance at training sessions due to the difficulty of finding a common workshop time for casual academics with other job commitments. She felt that this lack of education then impacted on the quality and consistency of staff preparedness for the program.

You know how hard it is when you have... a lot of casuals, which we do, that they have other commitments and they can't necessarily come for one hour in the middle of the day ... because they may be working at another job, because they're not teaching that week...

Sarah also found that ‘academic busyness’ was used as a reason for full time staff members not to engage in the preparatory training even though the staff members had shown interest in the program. This was a major concern for Sarah in regards to the quality and consistency of staff preparedness for the commencement of the program.

... some of them said we’re too busy to do something ... too busy to do this training and that training and that sort of thing. So even though they were interested, yes, some of them didn’t end up going to various training and things.
On the other hand, Priscilla, an academic with simulation experience at another university, felt very disillusioned with the minimal preparation of staff prior to implementation of the program. She found the preparation to be very disjointed with no apparent cohesion or connectedness to the development of effective preparation of staff in the area of high fidelity simulation:

*So to me, there is no team training, team environment everybody’s doing little bits and pieces and I think that’s due to lack of planning.....*

Lisa, a lecturer on a fixed term contract, also expressed concern at the quality of the preparation and the low attendance rates from academic staff at workshops. She also suggested that the program was problematic because it was spread across a number of campuses. She commented:

*I believe that not many staff have actually had training on it...So we haven't had that training and I think it's getting too half-hearted because it's over [a number of] campuses.*

For Jacqueline and Bridget, the workshops offered were not comprehensive enough to prepare them to facilitate a high fidelity simulation session for students. Jacqueline and Bridget felt underprepared and desired a more systematic approach to the workshops. They felt that this would enhance their memory retention. Jacqueline commented:
Yeah, it was only like a half hour in-service and for me, I would have liked it a more organised sort of approach, especially for the academics that are teaching the students ... it was very much you have to remember, and what to do to set up the scenario. I just felt that it wasn’t as organised as what it could have been... I thought, oh how am I going to remember how to do everything?

Carol reinforced this point, emphasising her feelings of being underprepared due to the lack of hands on practical experience in the workshops:

   I'm telling you, I went to three of them and I was none the wiser. There's no point in having somebody who's an expert twiddling with the knobs and going isn’t this good, look what you can do and you’re going I wonder if I could do that. You know, what did she do for that beginning bit? Hang on, what - you know, all that sort of stuff, that's what it was like.

Further to this, Vanessa found that the workshop introduced her to the essentials of the high fidelity equipment however; the fundamentals of teaching in a high fidelity simulation program were omitted. She commented:

   ...but it was all new and it was all about how to set up the machine...not actually how to teach in it...then we didn’t use it until about week 12
Bridget also believed that one session was an inadequate amount of time to engage with the large amount of information and practical learning required to understand how to effectively facilitate a high fidelity simulation session. She also emphasised the difficulties encountered in ensuring teaching content consistency and dissemination of information in a large casual workforce and multiple campuses in the following comment:

*I find we need more than one session. One session is not enough. The problem also, because we have lots of casuals, to make sure that they all get the same information... because we’ve got multiple campuses, so they’ve got to go out everywhere. Then, of course, what problems we have encountered may not be the same for those on other campuses.*

Summary:

These findings from the theme *Feeling underprepared* highlight the participant’s concern that they were underprepared for the introduction and adoption of a high fidelity simulation program. The majority of participants had experienced no previous education with high fidelity simulation learning and there was also a perception from some nurse academics that the educational sessions provided were insufficient in preparing them to competently facilitate a simulation session for students. On the other hand, the participants who had the responsibility to facilitate the high fidelity simulation education program for staff found that the lack of staff attendance at workshops was a key concern. Academic ‘busyness’ and a large casual work force were presented as potential causes for this lack of attendance. As a consequence, two major issues were identified: firstly the lack of
attendance from staff at the workshops and secondly the staff that attended felt that the educational experience was not comprehensive enough for them to facilitate a session. This feeling of under preparedness culminated in a sense of dissatisfaction with the educational program for the participants and a heightened sense of anxiety for many of them.

5.3 Being-in-the-world of implementing a new program

The next theme to emerge from the lived experiences of the participants was being-in-the-world of implementing a new program. At this time, there had been a sizeable investment from the School of Nursing and Midwifery and the University in the purchase of high fidelity simulation mannequins, the development of facilities to accommodate the high fidelity simulation mannequin and essential audio visual equipment to enable the program to be implemented.

For the participants’, being-in-the-world of implementing a new high fidelity simulation program revealed many challenges and a number of subthemes arose. The first sub theme was encountering communication and collaboration challenges.
5.3.1 Encountering communication and collaboration challenges

Barriers to effective communication and collaboration became evident when analysing the narratives of the participants. The participants highlighted a lack of communication and collaboration between academic staff members when developing the educational scenarios for the high fidelity simulation sessions and also amongst team members in the nursing practice units when implementing the program.

The development of realistic patient scenarios is an essential educational component of the high fidelity simulation program. Sarah, the initial academic advisor for clinical education prior to her position as coordinator of clinical education, shared her perspective on collaboration with the academic staff:
It was me and I collaborated really well with myself…. I had to develop simulation in the undergraduate nursing curriculum…simulation program I did it, basically. I was it.

Sarah felt the task was onerous as the initial development was left to her. She experienced an extreme sense of frustration due to the lack of collaboration from the unit coordinators during the development of educational material such as scenarios for their units of study. According to Sarah, the unit coordinators did not engage with the high fidelity simulation program and were content to receive the completed scenarios from Sarah without providing any input.

Sarah shared her story in the following quote regarding the lack of collaboration and resistance demonstrated by the unit coordinators when asked multiple times to participate in scenario writing:

The unit coordinators, the people I tried to get involved and I said... please let me know and I’ve nagged them from the beginning of semester, to say I wanted to do the scenarios in their units. What they did was-didn’t. So finally I got the unit outline, found out what sort of things they were teaching came up with some ideas for scenarios. I sent it off to the year 2 coordinators and said listen how about we do a scenario on this and this? How does this sound? Yeah that’s good.

From the quote above, it is evident that the channel of communication was only one way with Sarah initiating contact and receiving no response. For Sarah, this lack of engagement and collaboration from the unit coordinators increased her
workload and elicited a sense of disillusionment with the implementation of the program. Despite Sarah’s positions as academic advisor for clinical education followed by her promotion to the coordinator of clinical education role, she felt powerless to engage the unit coordinators into active participation in the high fidelity simulation program. This sense of disillusionment and powerlessness is depicted in the following quote. Sarah commenced by commenting on her ideal collaboration with the unit of study coordinators

... *getting staff to actually engage and contributing to case studies. Being more proactive in what they want instead of us having to push it all the time that they've got to be proactive, because I asked them at the beginning of the semester. I had conversations with them before semester started about putting simulations in, timetabling it in. It never happened*...

When Sarah was promoted to the position of coordinator of clinical education, Jane took over her role as academic advisor. Jane also experienced resistance and lack of collaboration with the unit of study coordinators. She found them to be passive recipients of information, unwilling to engage and communicate in regards to scenario writing or assistance with implementation. She felt increasingly disillusioned by this resistance and overwhelmed with the amount of work required to enable the students to receive a positive learning experience from the high fidelity simulation sessions.
Jane articulated her feelings in the following statements:

> It's my role to develop the scenarios, ensure that the staff have training,...

[I have to] write, publish, present [and all this] on a 20 per cent workload...the buck stops with me. The writing stops with me and - at this point. Again, I've put out the call to the unit coordinators to give me what case studies they want. What do they want to be included in the scenario?

They just basically send me the information.

From another perspective, eight out of the ten participants felt disenfranchised by the implementation process. These participants were team members in the nursing practice units where high fidelity simulation sessions were implemented. The participants were given the information for the high fidelity sessions via email by the unit coordinators; however, they were not invited to provide any input into the writing of the sessions.

Priscilla, a participant who had previous experience with the use of high fidelity simulation at another university felt isolated and frustrated by the lack of consultation and collaboration. She also believed that there was a distinct lack of cohesion between the staff within the program and an absence of a strategic plan for the programs implementation.

When asked about her involvement in the implementation of the program, she responded:
Not very much unfortunately. [I have taught] in two subjects so far but they haven’t involved me in any way at all... So there is no collaboration... I don’t think they’re actually using [me] at present.

For Priscilla, there was a real concern with regard to the impact that the lack of collaboration between academic staff members had on learning outcomes for the students. She highlighted the importance of teamwork, clear objectives and the evaluation of student learning outcomes to enable teacher identification of positive student learning experiences. Priscilla found these aspects absent upon implementation:

Between the team, poor teamwork collaboration... not having objectives, maybe the scenario should have been written as a team, not just as an individual so then everybody could have their input to see whether it would work ... because as you know simulation is meant to achieve a certain aspect. How do we know that it was achieved... the feedback sheets [were] more based on behavioural sciences... It didn’t actually focus on whether they achieved the goal... did they achieve their learning outcomes. To me, that was - I don’t know whether they achieved any learning outcomes.

Carol also indicated a sense of frustration and anger at the lack of collaboration between staff members during the implementation of the high fidelity simulation program. Carol felt devalued as an academic at her exclusion from the writing
She emphasised the importance of active participation and wanted to have more input into the scenario writing process for the high fidelity simulation sessions:

*I do believe that it should not just be one person writing the programs. I think they’re not exactly rocket science and we should be feeding into them.*

*I find it ridiculous that I have to basically write down everything I want step by step and then have somebody else poke it into a program. I mean frankly, I could do that myself and then make adjustments as I wanted to, rather than having somebody else having to write 10 or 20 programs. I want to write - I’ll write the scenarios...*

This absence of collaborative input into scenario development from the teaching team in the nursing practice units is further highlighted by Bridget in the following quote:

*... we didn't put in input into the scenarios or anything. We were just told these are the scenarios... [by the unit coordinator].*

Carol further identified a distinct lack of communication and team planning with the implementation of the high fidelity simulation program. She also questioned the consistency of the student experience across the curriculum because of lack of a strategic implementation plan. Carol commented:

*No, I don’t believe that we have a team that really thinks through strategically how we do it and how we splice it in... I was beside myself*
because [one] of the third year units has a one-hour clinical associated with it. They didn’t have any scenario put in there and I still don’t know whether they actually did that [the high fidelity simulation exercise].

Similarly, Lisa also experienced minimal collaboration between the nurse academics involved in the program. She believed that there was a lack of a strategic planning behind the implementation, with extremely ad hoc on the spot decision-making occurring. For Lisa, this lead to feelings of disillusionment with the program, as well as concern about the consistency of the learning experience for the students.

I think it was the, I don’t know who approached the unit coordinator, shall we do simulation in the last week for basic life support? What a good idea, whatever. It wasn’t really thought out.

Summary:

All participants felt that the implementation of the program lacked cohesion and collaboration however, the focus of their concerns varied. Sarah and Jane felt the responsibility of implementation including the writing of scenarios was left to them and were disheartened by the unit coordinators lack of contribution, collaboration and communication. On the other hand, the team members in the nursing practice units felt disenfranchised by the lack of consultation and collaboration from those responsible for implementation. It was also evident from the narratives of a number of participants, that a clear strategic plan had not been communicated to members of the academic team involved in the implementation.
5.3.2  A sense of a struggle

The second sub theme that emerged from the participants narratives related to implementation of the high fidelity program was a sense of a struggle. The participants voiced concern with lack of resource readiness both with technology and human resources. They also struggled with feelings of dissonance in the learning environment.

5.3.2.1  Lack of resource readiness:

Two minor themes became apparent when reflecting on the sub theme lack of resource readiness. These minor themes were technological resource and human resource; technical support staff.

5.3.2.1.1  Technological resource

When the first simulation sessions were scheduled to commence there were numerous technical difficulties and a number of the high fidelity simulation rooms were not completed. The technical equipment then came into the foreground for the participants creating a sense of anxiety for them as in most cases the technology was not running efficiently.

Sue reflects on her experiences at one campus where the building was not completely finished and the audio was not working in the room. She felt that these problems increased her anxiety levels when facilitating a scenario with the students.

... the building wasn’t complete, but when ... the students were actually in the scenario you couldn’t hear, the sound wasn’t working. So there were a few things that weren’t actually working, so that made it a little bit difficult. ... It can cause a lot of angst...
For Jane, a sense of frustration is evident due to lack of technological readiness and technical problems:

but the sim room has just been finished here at the [campus].... It's not even completely finished. We've still got a lot of glitches and hiccups. ..... and .... [at another campus] it has been finished for about 12 months, but again we've still got glitches with that as well. So the more you use it, the more those glitches will come up.

In addition, Jane felt that the educational experience for the students was also inadequate because there was no facility to record student performance or a specific area to debrief the students after the simulation. The debriefing room had been omitted from the initial building plan. She felt that this was a substandard learning experience for the students. She commented:

... It was still not finished, so we had no recording facility plus we had no debrief connection in the room. So we couldn't do it. We just ...
brought the students into the rooms and we had half - I put four in the room, four to watch and then swapped them around. So that was the debrief. So they could get the opportunity to watch somebody else do it. They didn't get the opportunity to see themselves do it.
All participants found the lack of technical equipment readiness extremely frustrating bringing the technology into the foreground instead of the educational experience for the students. This lack of technological readiness created a heightened sense of anxiety for participants. This is highlighted in the following quotes:

_“because the capability should be there, but it wasn’t working at that time”_ [Michelle].

_“I think a lot of people were having problems with the audio...”_ [Sue]

_“I just had to play - press the button scenario on and that was it but there was no communication. So there was meant to be communication with the simulation - with the simulator but there actually wasn’t because the AV wasn’t working”_ [Priscilla].

_“When I went to do mine, my voice is going through - instead of going into the CPU room - it was going into first year’s room”_ [Vanessa].

When asked about the negatives of the simulation experience for staff and students both Bridget and Jacqueline responded “technical difficulties”.

### 5.3.2.1.2 Lack of resource readiness: human resource

For the academic staff, being-in-the-world of change implementation became a struggle not only with the technology, but also with the lack of human resource support. The academic staff when coordinating a high fidelity simulation session felt
isolated, anxious and struggled with the lack of technical support from the technical officers. At this stage, the technical officers employed to assist with the set up and day to day running of the nursing laboratories had not participated in any training in the use of a high fidelity mannequin and therefore offered minimal assistance to the academic staff implementing the high fidelity simulation sessions. In addition, the management of the technical officers appeared to be a barrier in the preparation, participation and engagement of the technical staff with the high fidelity technology.

Carol outlined her frustration when running a high fidelity simulation scenario on her own. She considered the technical management and the lack of technical officer training for high fidelity simulation a huge impediment to the educational experience for students:

we simply don't have the infrastructure set up. For example, because you're in there trying to do everything - I mean our technical staff are very good ....... so they'll fit into everything but you see, they've got major problems with the management of the technical staff where they're told what they can and can't do from a distance and not trained up to do the things that they should be doing.

...So we've got a... resource that we know is good but we don't have a system set up to support it and this is what happens all the time.

Jacqueline outlined her sense of isolation and feelings of anxiety when facilitating a high fidelity simulation session with no technical assistance. She commented:
One man crew - which I find it so difficult - so isolated out there in room, 
fiddling around with something –[thinking] oh please work, please work.

This feeling of lack of technical support is further depicted in Bridget’s comments:

The first week it would not hurt to have a technician who was an expert on 
that so that you could do it and feel comfortable, because we did have 
some glitches.

Bridget further voiced her concern in regards to the expectation that academic staff 
should be computer experts with the necessary technological understanding of high 
fidelity simulation to successfully run a session. She finds this expectation 
unreasonable and feels that technical support is required:

... because we're not hired as computer experts...that's an unfair 
expectation isn't it because we're not expecting people as lecturers or 
[nursing]practice unit instructors to be experts on that equipment. So it's 
probably better if you have someone there supporting you so that you can 
manipulate things that you want to manipulate, but someone to actually 
look after the equipment.

Lisa also expressed feelings of lack of support from the technical staff. She believed 
that the technical staff were difficult and do not offer assistance to the nurse 
academic during high fidelity simulation sessions. She commented:
They're a very difficult lot. They're very difficult [the technical staff]. But I think if they know that person is doing the simulation a lot of them will just leave that person alone to do the simulation and that's it.

Priscilla found a distinct lack of involvement and technical readiness from the technical officers. She was astounded that some of them asked her for solutions to problems with setting up the high fidelity mannequin (SimMan®), highlighting their lack of readiness to participate in the high fidelity simulation program:

I don't think the technicians are involved. They do come occasionally ... and some of the technicians actually come to me if they're having these problems, can you come and have a look and sort it out.

According to Sarah, there is a definite need for a designated technical person with simulation experience to control the equipment. This, in turn, would reduce the amount of anxiety for the academic allowing the technology to fade into the background and the student experience to come into the foreground. She also acknowledges that with a large casual workforce you cannot expect staff to be experts with this technology and therefore resource readiness in the form of technical support is essential:

I think it's important that we have a technical person that can look after the equipment that we have on each campus, to free up the tutor to teach, instead of worrying about sort of - the problem is, as I said, we've got so
many [casual] staff. We've got so many staff. You can't expect everybody to be expert in it and everybody to be trained up.

Jane found the attributes of the current technical staff a huge barrier to change implementation. She felt that they were not open to embrace the new technology and undergo training. Jane believed that this lack of support was a huge impediment for the academic staff and increased their sense of isolation when running the high fidelity simulation session:

*I don’t think the technical staff we’ve got now can be skilled up to do that.*

*They’ve been in the jobs for more than 20 years and I don’t think they’re prepared to change.*

Michelle reflected on potential reasons that may impact on the technical officer’s involvement with the high fidelity simulation implementation. She contended that it may be a lack of confidence with new technology:

*S有时候它是因为人们不习惯于做某些事情 - 它是真的很难。很难学习 - 不仅仅关于人体模型，而且关于计算机和技术。有些人对此没有信心。*
Sarah goes further by suggesting that the technical officers’ may be scared of this technology which then inhibits them from participating in the program. She outlined her experience with one of the technical officers:

..I give the instructions on how to turn the compressor on. It just gets ignored. She is actually scared to touch it and I refuse to do it. You move that plug. You move the blue nob and turn it vertically. Now, she didn’t understand what I meant by vertically, so I had to explain it. But I refused to touch it. I said no, you do it. You do it. She eventually did. So you’ve got one person at the extreme. Scared of maybe, I don't know. Maybe she thinks it will just blow up. I don't know.

Summary:

The subtheme *a sense of a struggle* identified difficulties for the nurse academics in the area of lack of resource readiness in both technological and human resources. The technological environment was unfinished on some campuses and had inherent flaws at others which then created a heightened sense of anxiety for the participants. Due to these problems, the technology moved into the foreground of the implementation process whereas it should have been in the background to enable an effective student learning experience. The participants also described feelings of isolation and anxiety when running a high fidelity simulation session with no technical support. It became apparent from the voices of the participants that technical support was necessary for successful implementation of the program and to reduce this sense of struggle for them however, this support was not present at this time.
5.3.2.2 Dissonance in the learning environment

The participants unanimously expressed dissatisfaction with the quality of the high fidelity simulation learning environment due to large class sizes and the large student to teacher ratio. They believed that this was a huge impediment when implementing a high fidelity simulation exercise which led to feelings of conflict and dissonance for them. There was also a lack of consistency in the student learning experience evident from the various accounts of the participants.

Priscilla indicated frustration due to the large student to teacher ratio; one teacher to twenty five students. She found that the number of activities for the session as advised by the unit coordinators unreasonable and not educationally sound. She believed that this, in turn, impacted on the quality of the students’ experience when engaging in the high fidelity simulation session. She commented:

*That’s the disadvantage and that’s the problem that they are going to have is that you’ve got 25 students with one teacher and I’m running simulations and it's the first instruction that they had. So not only they had a whole heap of content that we had to go over for 2 hours... and then I had to actually very quickly brief them on what a simulation was, take them into ... the sim lab - and show them how it worked and then throw them into the simulation. So the preparation for it was very - to me, it was very awkward for students.*
She further discussed the difficulties when facilitating the simulation exercise with five students in the simulation room at a time and only one teacher to supervise a class of twenty five. She believed that it was a work health and safety issue if you leave twenty (20) students in the clinical laboratory unattended. As a consequence, Priscilla kept the twenty students in the control room with her, and therefore they were unable to practice other clinical skills designated for the session.

...really because I did have 20 students sitting around. Then ideally what they did want[unit coordinators] ... is that they wanted the five students in the simulation lab and the other 20 in a normal lab practising still But you can’t have students practising injections without a supervisor being there - that’s an OH&S issue. So I actually didn’t make them practice what they were meant to practice for that reason because there was nobody there to supervise them...if you’ve got a class of 25, you’ve got five in that lab and then another 20 students sitting in the control room because where else am I going to put them.

Whilst Priscilla did not allow her students to practice in the clinical skills laboratory unattended, Jane did. Jane’s students practiced for their upcoming clinical skills examination unsupervised. Jane acknowledges that she had no way of knowing what the student learning experience was like during that time period and expressed her frustration when facilitating a simulation exercise with such a large student to teacher ratio. She commented that not all students were able to
participate as the class was too big therefore the educational experience for the students was inconsistent:

... it's a problem with class sizes, so not all the students got an opportunity to use the simulator because it was just - the class sizes are too big. We have 28 students. It was run in the last week of the session, which took away time when we could have been in there to present, help the students with their OSCA [objective structured clinical assessment]. So we were in the sim room, half the students were doing probably jack all...

Carol, also voiced her feelings of frustration when implementing a high fidelity simulation session with large class numbers. She indicated her distress at the inadequacy of the learning environment due to the inability to provide all students with the same learning experience. In addition, the lack of opportunity to adequately facilitate student reflection in a debriefing format also made her feel a sense of disillusionment with the program. This is highlighted in the following quote:

I think that the going through the experience, imagine trying to run a whole class all by myself that I had very little debriefing time. That was the problem and yet that is probably the most important thing but even if every time you do one you don’t get the whole class through, you do get them to have a look at things and you should be able to get all of them to debrief.
Carol, like Jane, found that she was unable to supervise the rest of class when running the high fidelity simulation session with five students. She felt torn between the students in the simulation room and her commitment to the rest of the class. She considered the educational experience for the students practising in the clinical laboratory was inadequate. For Carol, as an educator this scenario created a sense of frustration and anxiety for her:

*If you’re going to run a SimMan® thing you can’t have the person running the lab in there knowing what’s happening... the academic...while the others are just having a design-your-own adventure down there. Now I’ve either got to be in the lab with the thing just coming up on the screen so that I can see what’s happening but I should be also up there guiding the students. I should have been able to have somebody timing things. So I was trying to do that, teach students, make sure ones in the class down there were okay, round them up, bring them in for the next round and get the whole class through in two hours.*

These sentiments are reinforced by Bridget and Jacqueline who also found the large class sizes and students left unattended in the clinical laboratory educationally unsatisfactory. This situation created a sense of anxiety and feelings of lack of control over the learning environment for both of them.
Bridget says:

_They all come up to SimMan®. They love it, but I might have the group up for SimMan®, and come back and one of my students is coming in after having a cigarette, and then they’re gone and the next time I come back … So you know that they’re not there practicing in the meantime…_ 

According to Vanessa, the large student to teacher ratio is related to lack of adequate funding for the high fidelity simulation program. She highlighted the importance of two lecturers being present in a high fidelity simulation session to not only support the educational experience of the students but also for student safety. She viewed this as a work, health and safety issue. She stressed her concern and anxiety about student safety and lack of control when leaving her class unattended to focus on the students in the simulation room:

_... it’s a money issue - if you’re going to do simulation you need to have someone doing simulation while the other members of the class are doing something else. So you need to have two lecturers. Because it’s too hard to do it like the other way...Injection, you can’t leave the students with the needle can you? See my third years, we’re doing injections. I had to leave them. They were injecting morphine sulphate into a bag of fluids and … Ah, some of them will be sitting around not doing anything…_

Summary:
The participants expressed feelings of dissonance with the large class size and teacher to student ratio when implementing a high fidelity simulation session. The participants wanted to implement the high fidelity simulation sessions but they had to leave students unaccompanied and this caused them to feeling conflicted and lead to a feeling of dissonance. They believed that under these circumstances they were unable to provide an effective learning environment for all students in the class. Work, health and safety issues were also highlighted by some participants as problematic as the majority of students were left unattended in the clinical laboratory. There was also inconsistency in the student experience across classes due to lecturer preferences and inadequate student to teacher ratios.

5.3.3 Feeling engaged

The participants whilst acknowledging the problems associated with the implementation of high fidelity simulation also believed that the introduction of a high fidelity simulation program was a worthwhile initiative. The majority of participants voiced feelings of enthusiasm with the presence of high fidelity simulation in the nursing program as an ongoing initiative.

Michelle offered a rating for the implementation of high fidelity simulation program as ten out of ten, stating that she loved it. Whereas Sarah found that the positive experience for her was observing the students excitement and enthusiasm for the high fidelity simulation exercise:
The positive is watching the students doing it and the excitement of what was going on. I think part of it is seeing them really gain something from this.

For Bridget, student exposure to the high fidelity simulation sessions was an invaluable learning experience. She believed that it assisted in developing critical thinking skills for students in situations such as cardiac arrest. Furthermore, Bridget felt that the student can experience emotions such as fear and learn how to use this fear in a positive way to actively manage a situation instead of becoming overwhelmed by the situation.

So it's about teaching them that feeling [fear] is normal ... It means they have to learn how to use that fear usefully, because we all feel fear. I'll always say ... look this is what I've been doing for years now, and I was scared the first time but you have to stop yourself and say, okay what do I do? Ask yourself what you're going to do, rather than run down the back steps... That's what I think is the biggest benefit about this, is you can expose them to something before it happens in real life, and teach them how to deal with it.

In addition, Lisa identified the importance of the realism of the scenario in high fidelity simulation. For Lisa, the student interaction with the mannequin is an effective learning tool because of the immediate feedback. She believed that this
feedback increases student participation in the activity as the students need to respond in a timely and meaningful manner:

*The positives is the realistic patient activity that ... if you respond to a patient appropriately you can then get that immediately. The student can get the immediate feedback on their care which they’re doing on the patient, which you can't on the other mannequins in the tutorial... there's an urgency and there's a sense of they can't just stand around and not participate*

On the other hand, Priscilla felt that the feedback from the students was positive which surprised her. She was sceptical about the student experience as she considered their preparation for the exercise minimal and inadequate:

*Well, I think there are some positives that came out of it...the feedback as far as I know was quite positive but I'm very surprised that it was because to me just to throw them into a situation, they didn't have any scaffolding or build-up to what they were going to achieve...basically the briefing was, this is your mannequin, this is the electronic arm, this is an IV arm, be very careful...*

In summary, the majority of participants voiced a positive attitude towards the high fidelity simulation program. They rated realism, student enthusiasm and the creation of a safe environment for student clinical practice as the important aspects of the program and appeared engaged with the program as an ongoing initiative within the nursing practice units.
5.4 Conclusion

In this chapter the themes being-in-the-world of imposed change and being-in-the-world of implementing a new program have been illuminated. Being-in-the-world of imposed change influenced the participants’ capacity to engage with the high fidelity program. The participants felt a distinct lack of connection with the program due to the lack of consultation between senior management and nurse academics in the initial stages of the introduction of the program. They also felt disempowered by this non consultative process and therefore felt unable to voice their opinions in regards to the program’s introduction. Feelings of lack of preparedness for the introduction of the high fidelity program also impacted on the participant’s capacity to engage with the program. The majority of participants had limited prior knowledge of high fidelity simulation and workshop preparation was minimal or absent for some of them. These feelings of lack of preparedness created a sense of anxiety for the participants as they felt this would impact in a negative way on the learning experience of the pre-registration nursing students in a high fidelity simulation session.

The second theme being-in-the-world of implementing a new program highlighted difficulties firstly in communication and collaboration between members of the nurse academic group. It became evident that there was minimal collaboration between team members which left all participants feeling disillusioned with the program. The second subtheme that became apparent was ‘a sense of a struggle’ which impacted firstly in the areas of resource readiness with a focus on technological readiness and human resource readiness. Due to this lack of resource readiness participants experienced feelings of anxiety when implementing high
fidelity sessions allowing a focus on technology to take over rather than engagement with the student learning experience. The second part of this subtheme was ‘dissonance in the learning environment’. Large class sizes influenced the nurse academics ability to engage adequately with the high fidelity learning sessions. They felt dissatisfaction with the learning environment as they were unable to facilitate students in their classes in a consistent and safe manner to enable an effective learning environment.

The last subtheme ‘feeling engaged’ demonstrated a positive attitude from the participants towards the implementation of the high fidelity program despite the difficulties encountered. Many of the participants were satisfied because the students were excited and enthusiastic with the high fidelity simulation program.

In the next chapter, stage two of the findings from the lived experiences of the participants will be presented.
Chapter 6: FINDINGS STAGE TWO

In this chapter the findings from stage two of the study will be presented. The participant interviews were undertaken three years after the initial interviews to enable time for the program to be established across the three years of the pre-registration nursing degree. It was envisaged that this time interval would enable further exploration and expansion of the meaning of the phenomenon for the participants. Five participants were reinterviewed in stage two which added depth and richness to the findings from stage one. The participants reinterviewed were: Sarah, Jane, Lisa, Carol and Sue.

The findings from stage two navigate the participants’ journey of ‘being-in-the-world’ of a high fidelity simulation program three years after implementation. In the process of uncovering the meaning of this phenomenon, I found that the journey did not run smoothly but rather, the lived experiences of the participants followed a fractured trajectory. Whilst searching for meaning along this fractured journey, there were similarities in the findings from stage one however additional themes emerged. The dominant dialogue related to obstacles or barriers and a lack of congruence in the engagement and uptake of this new program.

Following hermeneutic phenomenological reflection, the third major theme that was uncovered was a high fidelity simulation program three years on: a fractured journey. A number of subthemes were identified. The first sub theme to emerge was encountering obstacles with minor themes a diverse workforce and academic staff buy in. The second subtheme was technological investment versus human
incongruence (Figure 4). These findings will be presented in this chapter.

6.1 A high fidelity simulation program three years on: a fractured journey

![Diagram](image)

Figure 4 Stage two major themes and minor themes related to the liver experiences of nurse academics when introducing, adopting and implementing a high fidelity simulation program.

During the three year period of introducing, adopting and implementing a high fidelity simulation program, several changes had occurred in the pre-registration nursing program. A new curriculum had been accredited, and simulation as an educational initiative, had now been embedded into the curriculum. Class sizes in the first and second year nursing practice units had been reduced to a ratio of one academic to twenty students however; enrolment numbers had continued to increase in the school across all campuses. The students allocated simulated
laboratory time in the nursing practice units had also increased from two to three hours per week enabling students more time to engage with clinical skills practice.

6.1.1 Encountering obstacles

Significant obstacles were encountered by the participants on their journey. They found the diversity of the workforce a significant issue as well as buy in from the academic staff.

6.1.1.1 A diverse workforce

The diversity of the workforce was an issue identified by the participant in both stage one and stage two) of the study. Whilst there was a small percentage of permanent or tenured nurse academics teaching in the high fidelity simulation program, the predominant workforce were on casual contracts. The participants discussed significant challenges associated with the employment of a large casual workforce. These challenges included logistics of orientating casual staff, ensuring educational preparation, lack of expertise in the area and quality, continuity and consistency of educational content in the high fidelity learning exercises.

Sarah and Jane highlighted the high ratio of casual staff employed in the nursing practice units where the high fidelity simulation program was located:

- It's still the same, it hasn't changed. We've still got a large casual staff that are teaching in the [nursing practice units]. ...We've still got that issue... I'd say probably 80 per cent...[Sarah]

- A huge casual... [workforce in the nursing practice units][Jane]
Sarah emphasised that the casual workforce in the high fidelity program was a significant issue and had not changed over the three year period.

Carol concurred, elaborating on the large number of casual staff employed in the pre-registration nursing program. She commented:

... *we have an enormous amount of casual staff... We've just done contracts for 95. Across ... [a number of] campuses. That's more than the numbers of permanent staff and we certainly think that we've got more than 50 per cent of our teaching being done by sessional [casual] staff. So it becomes quite difficult...* [to orientate them]

Carol also suggested that adequate orientation of staff is problematic with such large numbers of casual staff. She emphasised this point by outlining the ratio of permanent to casual staff at one campus in the following quote:

... *[a] first year unit and these massive numbers of casuals, at [one campus], where they've got 34 classes, there is only two of them that are being taught by permanent staff. So we've got 32 classes being taught by casuals.*

Carol further highlighted this issue indicating that the large casual workforce impacted on staff preparedness for the high fidelity sessions and increased the workload for permanent staff as they needed to initiate training sessions for the casual staff. According to Sue, all teaching staff involved in high fidelity simulation sessions were invited to workshops but not all attended. This problem was identical to the lack of staff attendance that occurred three years ago.
Yeah but of course not everybody comes to it [workshops] because we've just had one in February and we had about 20 or 22 people. However, 15 of them were casuals so - they're the ones that run with it and one of the biggest problems is that because they didn’t have the education they didn't know how to utilize it. So even though you might have the scenario written, it wasn't being run because they weren't - didn’t want to use the equipment or [know] how to use it.

In the quote above, Sue highlighted how lack of workshop attendance can affect the quality and consistency of the learning experience for students as the academic is not adequately prepared to run an effective high fidelity simulation session. As a consequence, the activity may be omitted.

Carol, the casual staff coordinator, concurred with Sue, extending the conversation with a discussion on the limitations and difficulties of training casual staff. She indicated that casual staff members may only be able to be trained on a certain day, which then impacted on their access to training workshops:

*So when we have sessional [casual] staff, if they can only give us a Wednesday, then that is the only day they could come for training, because they're working the other days in the hospital, probably. So it becomes quite difficult. I can't do an orientation for them, for the casual staff. I have to get the campus staff to do it and then I go around and make sure that .... [it's done]*
However, according to Carol, if the high fidelity simulation training is not done at the beginning of the semester there will be workshops organised in the semester break:

*We spend a lot of time doing them in the breaks. So as soon as the students go on clinical placement, that's when we do a lot of our training and we book it ahead so that the sessional [casual] staff know ahead of time.*

It is evident, that this inability to attend workshops prior to the session is a significant problem for the quality and consistency of the program because, as Carol suggested, the majority of casual staff do not know how the high fidelity mannequin works and also had minimal prior knowledge of high fidelity simulation. Therefore, if their high fidelity simulation class is scheduled prior to their simulation education workshop they would not know how to effectively coordinate a session. The following quote highlighted this issue:

*- and I’m telling you, most of them won’t know how the high fidelity works at the moment. They couldn’t even say I want - can we next week go into there… [Carol].*

For Lisa, the education provided in the workshops was not comprehensive enough. She suggested that the content focussed on how you switch the equipment on and off and provides no theoretical explanation or contextualisation around simulation and its purpose within the nursing. According to Lisa, this is a significant issue for the casual staff member that has had no background in simulation learning. She believed that this minimal preparation of staff would affect the quality and consistency of the high fidelity simulation program:
come in here, turn on - yeah, and all that sort of stuff. There’s no theoretical... It’s just really hard to expect them to do something where they haven’t got a clue [casual staff]. So consistency ...- I guarantee it is very inconsistent.

In recognition of ongoing deficits in the preparation of staff in the area of high fidelity simulation, Sue the new academic advisor for clinical education, had implemented a number of initiatives. Initiatives such as regular workshops, casual staff expectations of workshop attendance and a formalised instruction guide on the technical aspects of high fidelity simulation have recently been put in place.

From another perspective, Jane suggested that some casual staff were not interested in using high fidelity simulation because it increases their workload:

Even speaking to some of the casual staff... they don’t like teaching in the labs here either for that reason [because simulation is too much like hard work]. Yeah and some staff collaborate really well. But there are the ones that don’t want to engage in it because of the extra work they are the frustrating ones.

According to Lisa, high fidelity simulation was more of an optional extra rather than a requirement in the nursing practice unit in which she was teaching. Lisa believed that making it optional for casual staff to introduce high fidelity simulation learning into their class is problematic because they were not motivated to include it. She also suggested extra workload may be one reason for lack of motivation by casual staff members to implement a high fidelity simulation session:
Now, for our casuals, they’re not motivated to do simulation... This year it was an optional extra. You could optionally, if you wanted to do it as the tutor ... With the expectation of starting off and finishing off the labs, the simulation room - ... the high fidelity - it is not a motivation of the casuals to do that, because they - if they have work till 6pm or 5pm, that’s when their pay finishes. The close-down might take 10 to 15 minutes and whilst that doesn’t seem much, and we’ve got great casuals who do, do it, that does add up over a period of time.

Furthermore, Lisa highlighted the importance of leadership as a motivator for casual staff members. She believed that if the program is not valued from the leadership team then the casual staff members who have had limited exposure and experience with high fidelity simulation will not have a model to follow. This then impacted on the quality and consistency of the learning experience for the students. Lisa outlined her thoughts in the following quote:

There isn’t consistency - there could not be consistency. It’s lack of education and lack of valuing from above. It’s hard to value something yourself. A lot of our casuals haven’t worked at any other university and haven’t seen a good simulation lab. So they’ve got nothing to work with... I don’t think they see leadership, so therefore if they don’t see leadership they’re not going to [implement the simulation]...

Summary:
The participants identified a number of obstacles related to the employment of a large casual workforce teaching in the high fidelity simulation program. The areas of most concern were in educational preparation, lack of role modelling for the casual academic and the quality and consistency of the educational experience for the
students. This problem was not new and had been ongoing since the commencement of the high fidelity simulation program. However, in response to this, the academic clinical education advisor had recently implemented initiatives such as an expectation that all staff attend workshops, a planned six monthly workshop program and a high fidelity simulation information manual.

6.1.1.2 Academic staff ‘buy in’

A significant obstacle to the adoption of a high fidelity simulation program that emerged from the data was the inconsistency of uptake and ‘buy in’ from the unit of study coordinators in the nursing practice units of study. Sue, the academic advisor for clinical education over the past twelve months, believed that a large impediment to the uptake of the high fidelity simulation program by the unit coordinators had been associated with lack of education in this new technology and resistance to change. She felt that this problem was starting to improve with the implementation of a regular education program and more familiarity with the equipment. Her thoughts are reflected in the following quote:

*I just think that because people just didn’t know the equipment and because they didn’t know it, didn’t want to use it. There were some unit coordinators who were pretty set in their ways. However, even those that were set in their ways have now done a backflip and are quite interested in it. I think it was just education was lacking and the other change that’s happened is that every six months there’s actually an education session for the staff, …getting them to come and play with it and just get familiar with how to use it.*
Sue emphasised the importance of unit coordinators taking responsibility for the implementation of high fidelity simulation into their units of study. She believed that this instils a sense of ownership in the program for the unit coordinator:

*I've delegated things to the unit co-ordinators and I'm not just the one solely making decisions about things, I feel that as the unit co-ordinator ... it's their responsibility. They need to take ownership for the material. It's not for me to tell them what to do or how to run their classes. It's their responsibility and I think in the past it was more they were being dictated to so because I've done this, things seem to run better and the unit co-ordinators are happy and if there's any issues they now contact me... as long as they stick to the guideline.*

However, leaving this implementation to the unit coordinators may be problematic which is evident in the following quote from Jane:

*I think it's no different to what it was three years ago being honest. Unit coordinators that don't want to engage in it. Then it just sits there and doesn't do anything. If the unit coordinator wants to implement it then I think that we've half won the battle but without their support you've got no hope.*

Jane indicated in this passage that the adoption of high fidelity simulation learning into a unit of study is dependent on the engagement by the unit coordinator. She believed that there was no difference to the consistency of uptake now than there was three years ago.
Carol concurred with Jane, maintaining that if the unit coordinators are interested in high fidelity simulation it will be incorporated into the unit but if not, it will be omitted:

*But it’s more the coordinators. When they’re interested in that [high fidelity simulation] then they’ll poke it into the units.*

Carol reflected on her feelings of disillusionment with the high fidelity simulation program after handing over a final year high acuity subject to another unit coordinator. In the previous year, Carol had run three high fidelity sessions for the student cohort however, when the new coordinator was appointed, the high fidelity simulation sessions were removed. She commented:

*I think I coordinated in 20[year]... We used SimMan® three times. I really wanted it embedded in the program... Anyway [the new coordinator] - and he just took it all out.*

This quote from Carol clearly outlined a distinct barrier in the adoption and implementation of the high fidelity simulation program as the unit coordinator can opt in or out of the program within the unit of study that they are coordinating.

Sarah agreed with Carol stating that there is still variation with uptake of high fidelity simulation within the units of study. Sarah attributed this variation to the attitude of the unit coordinators:
...the unit coordinators vary. We’ve got some unit coordinators who are very pro-simulation and they actively seek out the deputy... [however] some have to be dragged to the trough.

Sarah reflected on the reasons for this barrier in uptake by some of the unit coordinators. She suggested that it may be due to lack of understanding of the value of simulation, not a priority for them, heavy workload and perhaps just too much effort:

One maybe ignorance, perhaps they’re not aware of the value of simulation. Maybe it’s too much effort for people, maybe they’re too busy with other things, they don’t have a high priority.

Jane also contended that part of the resistance in implementing high fidelity simulation for the unit coordinators might be because it is hard work:

because I think they tend to think that it’s a lot of hard work, too much work. Do you know what I mean? Because it is. You’ve got to really instruct the technical staff what you want and what you require. It is hard work...but at the grassroots what the unit coordinators want to do is very individual. I think that’s the crux of it really.

Inconsistency with uptake is further highlighted in the following quotes from Lisa and Jane. They had both recently been members of teaching teams in nursing practice units however, in these units high fidelity simulation learning activities were either absent or presented as an optional extra. The inclusion or exclusion of high fidelity learning activities into the nursing practice units of study can be directly
attributed to the unit of study coordinators who give direction to their teaching teams:

*All last year not once did we go into using high fidelity [Jane].*

*We did it last year. This year it was an optional extra... It's still a non-event.*

*It's still a non-event [Lisa]*

Lisa and Jane both conveyed feelings of concern and disillusionment with the program. Furthermore, Jane believed that some of the nursing practice units were coordinated by staff with minimal teaching experience employed on teaching only contracts. She felt that the employment circumstances of these staff members may detract from the introduction of a new innovation such as high fidelity simulation because of their lack of experience and commitment. Therefore, this may create another obstacle in the uptake of the program. She commented:

*I think it's just too much work. It's easier doing something that's - I think you need a level of education or understanding of what we need to teach the students for the students to learn. If we don't have those people in the lab as unit coordinators they don't know what they don't know. When you have people who are unit coordinating who come with very little experience, who are employed as teaching only positions, so they don't have any research background... They're contract staff. We're giving them the role of unit coordination in these very complex [nursing practice] units and yet they're doing the minimal.*

Jane believed that the appointment of inexperienced staff to coordinate nursing practice units is indicative of the lack of value senior academics in management place on clinical units of study:
because we devalue most things about the [nursing practice] units. But they're so important to engage the student.

According to Jane, there are quality processes in place to ensure that high fidelity simulation is embedded in to the nursing practice units of study, however, if the coordinator does not include high fidelity simulation in the learning guide and unit outlines then this omission may go undetected:

because we do have quality processes and checking but it's like most things. If it's not in the learning guide for them to check then there's an assumption that the work is done and implemented. The problem is it's then lost in translation. I think that's the big thing.

Further to this, Carol believed that there is marked inconsistency in implementation of high fidelity learning activities from the unit of study coordinators. She suggested that the curriculum director should be empowered to monitor uptake and ensure consistency of high fidelity simulation across the program. Carol’s feelings are highlighted in the following quote:

Without somebody saying you must use this, a curriculum director...

But it's really - it's a design your own adventure, isn't it? [in reference to the unit coordinators] They can just decide I don't think I'll use those. You go well I don't think that's reasonable.

Sarah provided a pragmatic approach to the uptake of high fidelity simulation commenting well the progress has been slow but I'm happy that there is progress basically. Sarah’s statement infers a sense of frustration with the program in its
third year but it also shows a sense of appreciation that there have been improvements.

Summary:

It is clear from the participant’s narratives that the adoption of the high fidelity simulation program into the units of study was dependent on the attitude of the unit of study coordinators. Obstacles such as lack of knowledge and experience, lack of time and resistance to change were articulated as possible causes. All participants felt a sense of frustration with the inconsistency in uptake within the units of study. Another barrier identified related to inexperienced staff coordinating the nursing practice units which then had an impact on uptake. One participant attributed this choice of staffing to a distinct lack of valuing from management of the clinical education program. Overall, the participants felt dissatisfied with the level of engagement from the unit of study coordinators within the program to date.

6.2 Technological investment versus human investment: a lack of congruence

The second subtheme uncovered the participant’s feelings of lack of congruence between the availability of funding for the high fidelity technology compared with the funding for the academic and technical support staff necessary to enable an effective implementation of the program. As mentioned in the introduction to this chapter, in the period between stage one and stage two interviews, a new curriculum had been developed and approved by the Australian Nursing and Midwifery Accreditation Council. This new curriculum included the embedding of
simulation as a teaching and learning initiative throughout the three years of the pre-registration nursing program into the nursing practice units.

Participants highlighted that the embedding of simulation learning in the curriculum document was viewed with a sense of enthusiasm. Sue, the academic advisor for clinical education, emphasised that at this time there was a directive from the Dean to increase the presence of high fidelity simulation within the pre-registration nursing program: *we also have a new curriculum, so the word has come from the Dean ... [who] wants us to really push simulation* [Sue].

Jane, the previous academic advisor for clinical education, was very enthusiastic about the embedding of simulation learning within the curriculum. She also believed that within this difficult three year journey there had been positive change. One significant change, according to Jane was the increased clinical laboratory hours for the students. She indicated that this increase in hours would enhance the educational experience for students in the high fidelity simulation sessions as they would now have more time to engage in the simulation learning experience. Jane also displayed a sense of satisfaction that there was now an awareness of the positive educational impact of simulation learning for pre-registration nursing students. Jane commented:

> it's now embedded in the curriculum and we've been approved for the new curriculum for hours in simulation as part of curriculum accreditation. So that's all really good and it's actually embedded in the curriculum and the Uni. I mean now instead of having two hours for the students in the labs
they've got five hours of lab work every week. So the University and the school know the importance of the simulation.

Whilst sharing Jane’s enthusiasm for these improvements, Sarah was a little more reserved. She suggested that the embedded simulation philosophy in the curriculum and the introduction of blended learning at the University had led to a more general acceptance and awareness of simulation learning but she also acknowledged the struggle to get to that point:

So over that time we have embedded more of a simulation philosophy. In addition, the university has gone to blended learning, so that means the university itself is very supportive of having other modalities for learning. What that has meant is that there's been more, I suppose, acceptance of simulation.

However, according to Lisa, the presence of simulation in the curriculum document does not transform into reality. She believed that the simulation program required a lot more improvement but could not identify where the breakdown occurs. She suggested that there was a breakdown somewhere between the academic advisor and the teaching teams:

I’m sure in the curricular documents that we are telling [the accreditation board]...our nursing students are doing XYZ [in simulation]. So in documents it’s all there, but it’s just not happening ...but I can only talk about the breakdown between the [academic advisor]... and my level...I don’t know where the breakdown is...
All participants felt that the funding that had been provided for the purchase of high fidelity simulation equipment for the program had been substantial. Sarah suggested that the Dean had been very supportive in the area of equipment funding. In addition, funding grants from the University had also enabled the purchase of additional high fidelity simulation equipment.

*The Dean is very supportive [and] gives us funding for things... So that's fine. The university is supportive because it puts a special amount of funding out every year which is competitive and you can apply for that. It's through that that we got the SimMan® 3G and we've got other things.*

Further to this, Sarah believed that the University grant funding had assisted in the expansion of the high fidelity simulation facilities across the campuses. She suggested that the high fidelity simulation facilities are now used as a showcase for the university: *The University now is proud of the simulation. We get a lot of people visiting and they show off our lovely simulation areas.*

Jane also indicated that the financial support provided by the School of Nursing and Midwifery as well as the University for the purchase of high fidelity simulation equipment for the facility has been positive:

*I mean the school has been very supportive... I mean we've had to do funding, lots of funding runs. I think it's just general funding for whatever is needed to support the implementation of the curriculum. So you're up*
against other schools but we tend to get most of the money that we request.

For Jane, the high fidelity simulation equipment was state of the art and she considered that the high fidelity simulation facilities were well equipped:

The equipment, the technology is here. We've got it all. We can't get any more [management] It's been very supportive.

However, Jane, whilst acknowledging a sense of achievement with the program thus far, also articulated a sense of disillusionment. She believed that there had not been a significant improvement in the teaching and learning effectiveness of the program. She suggested that there was a distinct divide between the money spent on equipment and what is needed to successfully operationalise an effective high fidelity simulation program. She believed that the equipment was not being utilised to its potential:

I think it's no different to what it was three years ago being honest. It's just now we've got better equipment which is good, easier to use and it's nice having that functionality. But they're not being used properly. . I mean I think they get where we're coming from but they [management] don't see it I think I see it differently because I see the usability of it being wasted. They've spent hundreds and hundreds of thousands of dollars on equipment...

Carol also contended that this high level of simulation technology is wasted because there was no clear plan of how it can be best utilised and operationalised. She
suggested that management may be able to justify the cost without quality outcomes by keeping the equipment for an amount of time.

We need a really clear idea of how they are used in the curriculum. There is no point in spending $1 million or any other amount of money if you’re really not getting that level of benefit out of them. I guess the longer they keep it they can justify it and say we’re not doing too badly.

In addition, Carol provided a critical view of management suggesting that the academics in management are out of date and not really in touch with the day to day business of teaching. She further suggested that they are captivated by technology but have not provided the infrastructure and funding that is required to successfully implement the program.

If you think about the people who are at the top end of their curriculum development, they’re people who haven’t taught probably for 100 years. I’m not being smart about that. I’m merely saying it’s just what happens in organisations. Their jobs become so different to what’s on the ground and they’re still living on long term memory. They like the idea of the things that go bing. But not really how does it work and what - and then what they do is they look at the bottom line.

Furthermore, Carol envisaged problems due to increasing student numbers in the future. She believed that management had not strategically planned to accommodate for future growth. This is evident in the following quote:

But we just have such a massive number of students that what they planned hasn’t - I don’t think they’ve thought through very well how this can be operationalised. We’re alright at the moment, but we may not be,
just from a scheduling point of view, next year, as these - because these numbers are so big. So even six months ago, we've outgrown our... [facility].

For the majority of the participants, a sense of frustration with the program was still evident. Despite the improvements in up to date high fidelity simulation mannequins there remained minimal change in technical staff support or student to teacher ratio. The level of funding for equipment appeared to differ markedly compared to the financial commitment in human resource support; in essence, the level of staffing had not improved.

According to Sarah, there were limitations to the Dean’s support for the high fidelity simulation program. As mentioned at the beginning of this chapter, there had been strong support for improvement in the high fidelity simulation facility and equipment however increased staffing to improve teaching and learning effectiveness in the high fidelity simulation sessions had not been supported. The importance of adequate staff support is paramount for Sarah and she expressed her disappointment in the following quote:

*The Dean will support it but within reason, within limitations basically. She'll give us funding for that and she will support staff to go on conferences, she agreed us to host the simulation things, yes. Staffing's a big issue though. If you want more staff it's a bit difficult but most other things she's supportive of [laughs]. But of course I think staff is the important thing...*
With the introduction of the new curriculum there was an improvement in class sizes in the first and second year nursing practice units. First and second year classes were reduced from 20 to 25 students however, the number of third year students in a class remained the same at twenty five. This reduction did not relieve the struggle for academics within the learning environment. The problem highlighted in stage one where staff experienced feelings of dissonance with leaving the majority of the class unattended whilst running the simulation exercises, was still an issue.

Carol outlined her frustration with this ongoing issue. She used sarcasm to illustrate her disillusionment with management’s lack of funding priority in this area. Carol inferred that management would not increase the number of staff members present in a high fidelity session because of cost. For Carol, leaving a group of students unattended for a period of time and rushing back and forth between the clinical lab room and the high fidelity simulation room is an educationally unsound experience for the students and untenable for the nurse academic. She commented:

*Their SIM room was in the middle of somewhere in the lab and what was happening is that you have a class. One person runs a class. We don’t have anybody being an operator in the SIM room, nothing like that. We don’t want to put that sort of money in. So we have one person running the session... Then oh hang on, you’ve got to go and get into the SIM room with your students. Well, what happens to the rest of them? If there is nobody to say look at what’s happening here. How is this - what do you think about that? How could they have done that differently? They’re just making their own arrangements, trust me. They’re students. That’s what they do. What you’re doing is running back and forth to this room.*
Carol also identified the limited learning experience for the students as there is no educator in the room to assist with reflection on practice.

Lisa confirmed Carol’s view citing a similar scenario. She outlined how unprofessional she felt running up and down the corridor to ensure both groups of students have some supervision:

> As an academic you have to run the class. Our sim lab is separate. It's a dedicated lab ... you are expected to leave students in the main lab, take students down to simulation lab, do simulation, do everything you've got to do with simulation, plus run the other lab, plus do all the set-up of the - the set-up of the sim lab.. It’s very confusing, this running up and down the corridor business. It’s very strange behaviour.

Furthermore, Carol believed that the high fidelity simulation program is not being developed to its full capacity because of the inadequate human resource support. She suggested that student learning outcomes would be much higher if money was invested into improving staff to student ratios:

> I don’t think we are using it [simulation] to anything like its capacity. I think there is still not an understanding that some of the money you put into this stuff makes the outcome for the students much higher, without a doubt...we don’t want the whole lot in there. You want three or four people to interact.

Moreover, Carol suggested that the reduction of the staff to student ratio would be a more effective way to facilitate the high fidelity simulation sessions. She also
stressed the advantages of two academics in a simulation session which, she believed would enhance the overall student experience:

\[
\text{We actually need one to 15, is the absolute maximum we should have in the labs, in my opinion. If they want to go to 25 then they should have two people in the lab, in which case when they're doing a simulation it wouldn't be a problem because somebody would take the position at the controller.}
\]

Sue, like Carol believed that the reason why management would not increase staff numbers in the high fidelity simulation sessions was because of budget constraints. Sue predicted an additional obstacle to increasing the staff numbers is the lack of available academic staff due to the high student numbers in the pre-registration nursing program:

\[
\text{They can't - it's just - it's a monetary thing obviously and with the amount of students we have, it is difficult and also trying to staff it. They're having difficulty enough to staff the regular classes and then having - bringing a second person on makes - it's going to be difficult to do that.}
\]

For the participants’ this lack of investment in human resources in the program was not only in the academic arena but also in technical support staff arena. Technical support in the high fidelity simulation program remained problematic three years into the program. However, there had been some changes and improvements during this time with all newly employed staff now registered nurses. Prior to this, many of the technical staff had not had any nursing experience. In addition, the technical staff had now been trained in the technical aspects of high fidelity simulation.
According to Sue, the academic advisor for clinical education, the technical staff attended educational sessions and were more familiar with the equipment. She believed that they now possessed the ability to problem solve if issues arose:

*Technical staff have also been attending education sessions and they’ve been attending with the Laerdal people that have come out and gone through and get them a bit more up to speed, so they’re a little bit more - also happier with the equipment... Because they’ve also had a bit more experience and a bit more education, they’re happier as well with turning things on and knowing what to do if there’s any issues.*

However, even though the technical staff had attended educational workshops it appeared that there remained no technical support for academic staff during the high fidelity simulation session. In the following quote from Sue, it is clear that the technical staff only assisted with the initial set up of the high fidelity mannequin and not during a session: *...not during simulation. They’ll turn things on, they’ll turn things off...*

Sue when asked by the interviewer what would happen if there was a technical problem during the simulation she replied: *Touch wood that hasn't happened yet. Now that you've said it, it most probably will. It's just a case then of the person who's running it just troubleshooting.*

This quote from Sue reinforced the notion of isolation for the academic when immersed in a simulation session with no technical backup. It also gave a sense of lack of expectation from Sue as to the importance or need for a support person.
On the other hand, for Sarah, lack of technical support was a big issue. She had previously submitted an application to the Dean for a designated technician to support the high fidelity simulation program. This submission was rejected. Sarah in the following quote expressed a sense of hopelessness in regards to change or improvement:

*I did not get supported for an extra person; [the Dean] is not supportive in increasing staff because apparently we already spend too much on staff... I want a full time person in the control room to help, to free up the tutors. But that's probably a pipe dream.*

Further to this, Sarah commented that management did offer the technical officers a chance for promotion. They were given the opportunity to elevate their employment level from four to five if they assisted with the high fidelity simulation program:

*So what they did decide was that they would come with this broadband position, the level four or five that would employ people. Nobody had simulation experience so they were employed at level four...But there is an opportunity for them to step up a level and that step up a level includes simulation. So if they get enough training, and feel confident and competent enough, they can apply to go up to a level five position, which means that they set up the SimMan®, prepare it and troubleshoot the SimMan® and also help write scenarios. But so far no technical person has actually done that*
In the following passage, Sarah explored the reasons why there was no uptake for this level five position:

Q: was it an extra staff member or were the staff?
A: No it’s the [no extra technical staff were appointed] (Sarah)

Q: ...and do it plus the work that they were doing before?
A: Yes basically. That’s why it’s a level five. So the work that they... (Sarah)

Q: Do you think that’s got anything to do with nobody putting their hand up?
A: Yeah well it may be. But if they did the level 5 job they’d do less of their previous [work], but they’ve only got the same hours of the day. So that would be more of a focus and they would actually do less of the other role, yes. But that was an expectation of the people who developed this level four or five. That’s a given isn’t it? That you can’t expect to do that. (Sarah)

Q: But then who picks up their other work?
A: That’s right yeah, but that’s a very good point. (Sarah)

Q: ...they’re not giving any extra resources apart from taking it up a level.
A: Yes and you’re right, so there’s no extra resources were given for this at all, that’s right. What they did, as you say, was the solution was to use the broadband position and you’ve already identified some of the issues around that point. Yes it’s not surprising really [Sarah].

After discussion it became clear to Sarah that without the appointment of an extra staff member the workload for the technical staff would increase markedly if they were to accept the position. Sarah concluded that in real terms, there was no extra staff support offered by management and suggested that it was not surprising that the technical staff were not willing to apply for the position.
In addition, Lisa also believed that the reason for the lack of technical staff support is largely because it is not supported by management. She felt that there has been no change in technical support over the last three years. The following dialogue from Lisa indicated an overwhelming frustration with the lack of assistance from the technical officers. She highlighted the importance of a dedicated technical officer to assist with the high fidelity simulation program and stressed how unrealistic it is to expect an academic to do the set up as well as run the session.

.. there is no technical assistance... what was letting it down three years ago is still letting it down, I feel, today. So all the criticisms that I had, I can't see any advancement or change in them, seriously.

... you do need technical support and they have yet to have technical support. They've actually dwindled it down and it is challenging

When you've got back-to-back classes, I think it's totally unrealistic of - it's not supported. The sim clinical is not supported from above [management]. It's just treading water to do all the other stuff. It is not supported, because you cannot have back-to-back classes and expect to go from one area of the university to the other area of the university and do the set-up.

... you have to have a dedicated lab tech. You just - you can’t expect academics ... whether from casual to permanent - to be doing all the set-ups. It’s just - it’s very, very difficult.

Lisa appeared overwhelmed, frustrated and at times her body language indicated anger at the lack of technical support during the high fidelity simulation sessions.
Whilst Sarah and Lisa highlighted the problems associated with lack of extra human resource allocated at a management level for the high fidelity simulation program, Jane focussed on the lack of assistance from the technical officers at her campus. Jane voiced her frustration at the lack of engagement from the technical staff in the high fidelity simulation program. She believed that this problem is the same as it was three years ago and had withdrawn in frustration from teaching in the high fidelity simulation program for the present time.

*the other thing with the technical staff, a real issue with them and the mannequins, the high fidelity ...mannequins; they just want to avoid it. So the technical staff are employed as registered nurses yet they're not wanting to engage in any of the simulation.*

Jane suggested that at the campus where she was located, the lack of assistance from technical staff is worse than at any other campus. She believed that the technical officers viewed high fidelity simulation as too much work and that they don’t see high fidelity simulation assistance as part of their role.

*Here at [campus]... [engagement by the technical officers with simulation]... that doesn't occur. I think if they're driven that that's their role but I have a feeling that it's just too hard for them. It's too much work. They see the simulation, the setup of the mannequins, the packing up, putting liquid into the abdomen so they can put a nasogastric tube down and get liquid back as a mess and a problem.*
According to Jane, one problem inherent in the lack of uptake of the high fidelity simulation program lies with the lack of support from the technical staff:

_The barriers to that being implemented at the grass root is the issue because you’ve got the technical staff, not all, some of them, not wanting to support [it] ..._

Furthermore, Jane believed that the major barriers to uptake of high fidelity simulation are the unit coordinators and technical staff:

_Unit coordinators, technical staff. The equipment, the technology is here. We've got it all. We can't get anymore._

Another area of significance that emerged from the participant’s narratives in relation to lack of congruence between technological investment and human investment was the role and time allocation of the academic advisor for clinical education. As part of this role, the advisor was expected to lead the uptake and implementation of the high fidelity simulation program. Over the three year period, there had been three academics involved in this role with very little time workload allocation to enable them to implement the high fidelity simulation program.

Sarah (the first academic advisor), when discussing the lengthy and frustrating implementation journey, suggested that the designated workload allocation for the academic advisor role was a significant factor. She described the workload
expectations of the advisor as excessive. She stated that the advisor was only allocated one day a week for this task and was expected to oversee and implement the simulation program across a number of campuses. In addition to this role, the advisor also had responsibilities within the clinical education area. The advisors also had the additional role and responsibility of unit coordination. Another impacting factor was that two out of three advisors were also enrolled in a doctoral program which was a requirement of their employment. Sarah clearly believed that the workload allocation from management for the introduction of a high fidelity simulation program was unreasonable and unrealistic. Sarah commented:

The [advisor’s] roles are only point-two, one day a week, that’s all the workload they’re given. They’ve both been unit coordinators so they’re trying to do - and plus try and get the research profile, they’re both enrolled in PhDs. So here they are trying to do everything else and yet they’re still expected to drive simulation. I think that’s part of the delay, has been because it’s not a full time workload for them. They've done the best they can and they’ve certainly done more than the point-two for sure. But it does take time. So we haven’t had a dedicated person just for simulation.

Yeah and I think that’s the major reason. So they've tried the best they can, we all have, us three [advisors], have tried the best we can to progress it as fast as we can. But you're only given - you've got to do many other things as well, that’s been the problem.

Sarah suggested that this workload allocation was a huge obstacle to the uptake of the program and all three advisors had performed well. She believed that there must be a designated simulation coordinator for the implementation to be more successful.
In addition, Carol highlighted the importance of the curriculum director to drive the high fidelity simulation program within the curriculum. She believed that this would increase consistency. According to Lisa, what is needed is a champion, a person with drive and passion to push the implementation of the program.

_I really don't want to come across as cynical, because I think there's some really good people. Again, you can only work ...as well as you're allowed to work. I think ... really ...- you just haven't got one person who's been pushing it through because of their passion of it._

6.2.2.1 Summary
This subtheme demonstrated a distinct lack of congruence between the school and university’s investment in the technological aspects of the high fidelity simulation program and investment in academic and technical resource staff to support the implementation of an effective learning environment for students. There was initial excitement from participants in relation to inclusion within the curriculum of simulation learning and the overall university awareness of the importance of the high fidelity simulation program. It was also acknowledged by participants that funding had been substantive from both the School of Nursing and Midwifery and the University to enable the establishment of state of the art high fidelity simulation facilities across the relevant campuses. However, it became clear from the voices of the participants that there was a sense of disillusionment with the program. Participants found that funding to increase academic staff numbers to provide an effective learning environment for students was not supported by management.
Technical support staff were also not engaged to assist the academic staff during high fidelity learning exercises even though they had had workshop education to enable them to assist. Overall, the participant’s continued to feel a sense of isolation and struggle when facilitating a high fidelity simulation session and felt that the educational experience for the students was substandard. They also voiced concern with the lack of support and a clear strategic plan from management. Some participants felt that management were captivated with the idea of technology without regard for providing the infrastructure to enable successful implementation of the program.

6.3 Conclusion

In this chapter the major theme a high fidelity simulation program three years on: a fractured journey has been explored. The first sub theme ‘encountering obstacles’ was central to the participant’s mode of being in this fractured journey. A number of obstacles or barriers emerged for the participants. A diverse workforce with a large percentage of casual staff teaching in the high fidelity simulation program was the first obstacle encountered. Difficulties were evident with the consistency of educational preparation for staff which then impacted on the consistency of the learning experience for students. Another obstacle that was encountered was variation in uptake of the high fidelity simulation program within the units of study. It became evident that the uptake was dependant on the attitudes of the unit of study coordinators. This variation created a sense of frustration and disillusionment from the participants as they believed that the learning experiences for students was inconsistent and therefore unsatisfactory.
The second subtheme that emerged from the lived experiences of the participants was technological investment versus human investment: a lack of congruence. This sub theme uncovered the participant’s feelings of disillusionment with the disparity in the program between investment on technology and human resource support. They found that the technological equipment was state of the art however human resource support was lacking. They identified that a lack of technical support within the high fidelity sessions and large student numbers were incongruent with effective student learning.

Reflection on the narratives of the participants has uncovered a number of themes in the lived experience of nurse academics in the introduction, adoption and implementation of a high fidelity simulation program. These themes have been presented in the previous two chapters. In the next chapter, further interpretation and discussion of the phenomenon will be presented.
Chapter 7: DISCUSSION

This discussion chapter draws together the findings of the lived experiences of participants' being-in-the-world of the introduction, adoption and implementation of a high fidelity simulation program into a pre-registration nursing program. Although the term simulation is not new in nursing, the recent advances in high fidelity simulation technologies can be considered to meet the criteria of an innovation according to Rogers (2003), since the faculty members were unfamiliar with this new technology.

When examining the text from an ontological perspective, it is important to note that the findings are inextricably linked to Heidegger’s concept of temporality whereby Dasein is immersed in time and is inseparable from the past, present and future (Miles, et.al., 2013). Ontologically, the participant’s mode of being is fundamental to their being at this time and looking through this lens as a researcher, three major themes were identified to describe the phenomenon. The three themes that were uncovered were: being in the world of imposed change; being in the world of implementing a new program and a high fidelity simulation program three years on: a fractured journey. For each major theme, a number of sub themes and minor themes emerged.

7.1 Being-in-the-world of imposed change

7.1.1 Feeling disconnected

Being in the world of imposed change elicited two sub themes; feeling disconnected and feeling underprepared. The first subtheme feeling disconnected uncovered
feelings of lack of meaning, lack of connection and powerlessness from the participants. It was evident that the vision for the program came from one senior member of staff in consultation with the Dean of the School of Nursing and Midwifery at the time. The participants were not involved in any of the decision making process for the introduction and adoption of the high fidelity simulation program.

The senior staff member resigned from the University in the early stages of the program development. However; there had been a commitment from senior management in the School of Nursing and Midwifery to introduce a high fidelity simulation program and therefore it was essential that the program proceeded. The participants were expected to engage with the program despite their lack of previous experience with the use of high fidelity simulation. The majority of the participants were unsure, not only of the capabilities of the high fidelity mannequin, but also of the requirements of how to design, implement and evaluate the use of simulation in a pre-registration nursing program.

From the outset of the high fidelity simulation program, the participants regarded the high fidelity simulation program as something imposed on them and being-in-the-world of this imposed educational change evoked a search for connection and meaning. For Heidegger, meaning is the ability to understand something for the thing it is. The meaning lies in the uncovering of possibilities and to be able to exist authentically, an awareness of existence must be present to be able to see oneself as having possibilities (Gelven, 1989). Furthermore, Heidegger believed that without interpretation, or awareness, the person is void of possibilities and to enable
interpretation, the as structure of our understanding must be made explicit. Heidegger believed that the “as structure of our understanding is based on our seeing the world as ready-at-hand, and not as something that is present-at-hand” (Gelven, 1989, p.95). Therefore, without meaning and understanding, the participants were unable to see the possibilities or the ‘readiness to hand’ of the high fidelity program (Heidegger, 2010).

Heidegger asserted that the longer an object is looked at and not used the further it is removed from its correct meaning (Heidegger, 2010). This point is illustrated by the lived experiences of two participants when discussing the delivery of a box containing a high fidelity simulation mannequin. In both instances the high fidelity mannequin (SimMan®) remained unused for several years and was therefore devoid of purpose and possibilities. For these participants, the box had no meaning and could be regarded as ‘present at hand’ as they were unsure of its possibilities.

According to Jeffries (2008), these circumstance have been mirrored in other nursing faculties where high fidelity simulation equipment has been purchased with the idea that academics will embrace this new technology. Instead, the equipment lies dormant for a number of years because faculty are not adequately prepared for this change in pedagogy. This finding is also supported by Taplay et al., (2015) who found that getting the mannequin out of the box was an obstacle for many faculties due to the lack of a designated leader and a clear plan from management as to how simulation would fit within the curriculum.

Furthermore, it was clear from the narratives of the participants in this study that there was no clearly articulated vision for the introduction of high fidelity simulation
program. It was also not incorporated into the curriculum at this stage of the study and its presence within the nursing practice units of study was ad hoc. According to Gaba (2007), Jeffries (2005), Starkweather and Kardong-Edgren (2008) simulation is far more effective as a teaching and learning tool if it is embedded into the curriculum rather than as an adjunct.

As mentioned at the beginning of the chapter, the senior staff member who was leading the program had left the university and the vision was not adequately documented or communicated. There was also no documented philosophy or strategy underpinning the introduction of the program. Taplay et al. (2014b) found that the presence of a strong guiding philosophy behind the implementation of simulation learning increased the level of uptake within the faculty. They also highlighted the importance of a documented vision and value statement that can be used to provide a strong rationale to secure resources and to promote integration of high fidelity simulation across the curriculum (Taplay et al., 2014b).

Following the departure of the senior academic, the academic advisor for clinical education was then placed in a leadership position by senior management to drive the adoption and implementation of the program. Whilst she had a background in clinical education, she did not have a comprehensive background in high fidelity simulation learning and was also not part of the initial decision making process for the program. She was then required as part of her job description to become an ‘expert’ and leader in the area of high fidelity simulation for the School of Nursing and Midwifery. Recent research in the area of nurse faculty leadership indicated the importance of personal development in the leadership journey. This journey
requires the nurse leader to explore role clarification “as well as intrapersonal and interpersonal work with self and others” (Horton-Deutsch, Young, & Nelson, 2010, p. 492; Young, Pearsall, Stiles, Nelson, & Horton-Deutsch, 2011). For the new academic advisor for clinical education, there was very little time to follow this reflective path as the adoption of simulation learning had already commenced within the School of Nursing and Midwifery and she was now required to proceed with its implementation. This finding was also similar to Taplay et al. (2015) who found that often the role of a simulation leader was required to develop quickly without a clear job description.

Further to this, the leadership role of the academic advisor for clinical education was diverse encompassing not only the implementation of high fidelity simulation but also advising across the clinical education program within the nursing practice units of study. The leadership role for the introduction and adoption of the high fidelity simulation program was also multifaceted. The academic advisor for clinical education was not only required to advise on the building of the physical space for high fidelity simulation, engage and educate the academic and technical staff, but was also expected to initiate the educational objectives and content areas for the high fidelity simulation learning exercises. Similarly, Taplay et al (2014a) found in their research study that the simulation leader’s role was diverse and varied across organisations. They identified a number of common characteristics inherent in most programs such as developing educational workshops for staff in both equipment
functioning and utilisation, ensuring and organising positive learning experiences for students as well as overseeing the facilities (Taplay et al., 2014a).

A number of the participants highlighted dissatisfaction with the lack of consultation in regards to the implementation of the high fidelity simulation program between senior management and the nurse academics in the nursing practice units. The existential theme, lived human relations can be seen to pervade the participants life world at this time (van Manen, 1997). The relationship between senior nurse academic management and the participants was problematic due to the participant’s perceptions that the high fidelity simulation program had been imposed on them without any consultative forum. As a result, the participants felt powerless to voice their opinions. Several of the participants articulated that they could see no clear plan or infrastructure in place for the introduction of fidelity simulation into the nursing practice units and hence felt a lack of connection with the program. This power imbalance in organisations when considering new innovations has been discussed by Rogers (2003). He proposed the concept of centralisation whereby the degree of power and control in an organisation is held in the hands of a small number of individuals. Rogers (2003), suggested that centralisation has been associated with lack of innovation due to the range of ideas restricted to the few that dominate the system. As a result, when faculty members are not encouraged to take part in the decision making process, the uptake and implementation of high fidelity simulation can be poor (Hanberg, 2008).
7.1.2 Feeling underprepared

The second subtheme uncovered the lived experiences of the participant’s feelings of a lack of preparedness for the introduction and adoption of the high fidelity simulation program. The academic advisors’ for clinical education had advertised and offered educational workshops for the participants however; all participants expressed dissatisfaction and anxiety with their level of preparation. There was no formal scheduled education program for the introduction of high fidelity simulation education although educational workshops were offered throughout the semester by the academic advisor for clinical education. The workshops covered the technical aspects of high fidelity technology mostly focusing on how to set up and switch on and off the equipment necessary to facilitate a session.

From the perspective of the academic advisor for clinical education, staff attendance at the educational workshops was problematic. She found that there was extremely poor attendance at the majority of the workshops. Upon reflection the academic advisor suggested a number of possible reasons for this low participation rate such as a large casual workforce and ‘academic busyness’. This situation not only frustrated the academic advisor but deeply concerned her in regards to staff preparedness to ensure consistency of educational experience for students across the program.

Conversely, some participants who attended the workshops found that the level of instruction was not adequate to enable them to facilitate a session. They believed that one session on the technical aspects with no hands on learning was not enough. Some of the participants suggested a more structured and systematic
approach to the workshops would enable a more comprehensive understanding relating to the use of the high fidelity technology. These participants were also concerned that not all team members had received an introductory education session and therefore would have no understanding as to how to run a high fidelity session.

At this stage, for most of the participants, their knowledge base relating to the facilitation of high fidelity simulation session was minimal and the preparation across the nursing practice units was inconsistent. This created a feeling of being underprepared and a sense of anxiety for all participants. Similarly, King et al. (2008) found that an absence of structured educational preparation for faculty members led to an increased sense of discomfort and lack of feelings of competence when engaging in simulation learning activities. The importance of academic staff training and education to increase consistency of high fidelity simulation uptake is highlighted in a number of other studies (Griffin-Sobel, 2009; Jeffries, 2008; Starkweather & Kardong-Edgren, 2008).

Rogers (2003) diffusion of innovation theory addresses the importance of knowledge acquisition when adopting an innovation such as high fidelity simulation. Roger’s (2003) theory has been used by a number of scholars in the area of simulation as a framework to assist in understanding the process involved in the embedding of high fidelity simulation learning into a curriculum (Griffin-Sobel, 2009; Hanberg, 2008; Starkweather & Kardong-Edgren, 2008; Taplay et al., 2014a, 2014b, 2015).
Rogers (2003), theory suggests three types of knowledge that are essential elements in increasing the uptake of an innovation in an organisation. The first is awareness-knowledge whereby the individual gains awareness and information about the innovation which may then lead to further interest in the next two stages. For the participants in this study, awareness came from informal discussion amongst academic members of staff and an email was sent inviting them to a workshop. However, there was no formal introduction or educational session. This first stage of Roger’s theory (2003), relates to the participants’ feelings of lack of meaning as does the Heideggerian concept of possibilities (Heidegger, 2010). The lived experience of the participants was one of lack of knowledge and lack of awareness of the possibilities of the high fidelity simulation program. Therefore, the high fidelity simulation technology was ‘present to hand’ and not ‘ready to hand’ for the participants to be able to use effectively (Heidegger, 2010).

The next type of knowledge according to Rogers (2003) is the how-to knowledge. The how to stage encompasses the individual understanding of how much of the innovation to use and how to use it correctly? The participants in this study felt a lack of how-to knowledge as they believed that the educational preparatory workshop was inadequate and did not provide them with enough information to adequately and knowledgeably facilitate a high fidelity session. This second stage also correlates with Heidegger’s concept of possibilities, as the participant’s how-to knowledge was inadequate and therefore the capabilities of the program remained present- to- hand (Heidegger, 2010). The third stage encompasses principles knowledge and this type of information deals with the underlying principles of how an innovation such as high fidelity simulation works. This type of knowledge was
absent in the preparation of participants for the high fidelity simulation program, as
at this stage in this study only one preparatory workshop had been offered.

7.2 Being-in-the-world of implementing a new program

7.2.1 Communication and collaboration challenges

The second major theme being-in-the-world of implementing a new program
elicited a number of sub themes with the presence of some minor themes. The first
subtheme uncovered the participants’ experiences with communication and
collaboration challenges amongst academic staff members. To enable
understanding of this sub theme a working definition of communication and
collaboration will be given. Communication can be defined as a process where
information is created and shared between people in order to reach a mutual
understanding. In this way communication can be considered as a two process
rather than a linear act (Rogers, 2003). Whereas, collaboration is defined as the
process of individuals working together to achieve common goals (Childress,

Communication and collaboration challenges between nurse academics involved in
the high fidelity simulation program were identified as a significant problem. van
Manen’s concept of existential lived human relations is central to this subtheme as
it focuses on how we maintain relationships with others (van Manen (1997). It
became apparent that there was a breakdown in lived human relations between the
academic advisors and a number of groups within the high fidelity program as
outlined in the following section. Firstly, lived human relations between the academic advisors for clinical education and the unit coordinators became problematic due to a number of communication channel breakdowns. Part of the development for the implementation of the high fidelity simulation program involved the creation of realistic patient scenarios for the student learning experience. The academic advisors were the initiators of this component however; they requested input from the coordinators of nursing practice units of study where the high fidelity learning exercise would take place. The academic advisor for clinical education made multiple attempts to engage with the unit coordinators, however, they would not collaborate. As a result, with feelings of frustration, the academic advisors developed the scenarios without any input from the unit coordinators.

This breakdown in human relations between the academic advisors and the unit coordinators in the development of patient scenarios may be due to a knowledge deficit on the part of the unit coordinators. It was evident that only a small number of nurse academics involved in the program had participated in any external workshops related to simulation learning. In addition, the workshop content for the high fidelity simulation program was specific to the technical components of a high fidelity. Therefore, the majority of the unit coordinators had not had prior experience with scenario writing and this lack of preparation may have been an impediment to their engagement. Starkweather and Kardong-Edgren (2008) found that a comprehensive writing retreat for nurse academics increased the uptake of simulation learning across the program. They found that the academics at the retreat, with a broad variety of expertise within nursing, worked together to explore the development, implementation and evaluation of realistic patient scenarios. The
authors found that this collaboration built faculty interest and enthusiasm for the overall simulation program (Starkweather & Kardong-Edgren, 2008). Similarly, a study by Irwin (2011), found that senior faculty identified the importance of education in the creation and writing of scenarios for all full time members of staff involved in a simulation program. In addition, Waxman and Telles (2009), suggested that faculty development is critical to the successful implementation of a simulation program. This finding is also supported by Adamson (2010), who identified that lack of time to plan and design scenarios is a significant barrier to faculty participation in simulation. The education of the nurse academics in scenario writing for high fidelity simulation learning exercises in my study was not part of the preparatory educational program provided for them.

The second component of the participant’s breakdown in human relations was evident in the communication and collaboration challenges experienced between the academic advisors and other members of the nurse academic team teaching in the program. A number of the participants felt isolated and disenfranchised by their lack of input into the development of realistic patient scenarios for the program. It was evident that there was no clear communication channel between the academic advisors for simulation, the unit coordinators and the academic team members in the nursing practice units. Rogers (2003), defines a communication channels as “the process by which participants create and share information with one another to reach a mutual understanding” (Rogers, 2003 p.18). For the participants in this study, this problematic channel of communication appeared to have three tiers. The first tier appeared as the lack of communication between the academic advisors and the unit coordinators in the initial stages of the development of the scenarios.
The second tier was between the unit coordinators and the academic team members as the team members were not invited to provide input into scenario writing. The third tier was the lack of communication channels between the academic advisors and the academic team members. As a result of this communication barrier, the academic advisors were unaware that a number of the nurse academic team wanted to be included in the scenario writing process and hence the opportunity for a rich collaborative writing team was missed.

For a number of participants lived human relations between the members of the high fidelity simulation program created a number of different emotions. For the academic advisors it was one of frustration, for another participant feelings of anger were expressed due to the lack of collaboration between the nurse academic team members in the scenario writing process. Another participant felt excluded from the scenario writing process and developed a negative attitude towards the program.

In addition, a number of the other participants believed that there was an absence not only of collaboration, but also of a clear integration plan of where and when the simulation scenarios were to be incorporated into the nursing practice. They found it very ad hoc. Indeed, Dubose, Sellinger-Karmel and Scoloveno (2010) stressed the significance of faculty taking time to plan and develop clinical scenario writing. They highlighted that the most important aspect of this process is that faculty choose the correct unit of study for scenario placement (Dubose et al., 2010).

**7.2.2 A sense of a struggle**

The second subtheme identified was a sense of a struggle. Significantly, there were two key areas uncovered from the lived experiences of the participants related to
this sub theme. Firstly, lack of resource readiness, with minor themes relating to technological and human resource readiness and dissonance in the learning environment. This sense of struggle elicited feelings of anxiety and discomfort for the participant’s being-in-the-world of implementing a high fidelity simulation program. This feeling of anxiety may be examined from an ontological perspective. Heidegger used the German word angst which has been translated in the English language to mean anxiety or dread (Gelven, 1989).

What anxiety is anxious for is being-in-the-world itself. In anxiety, the things at hand in the surrounding world sink away, and so do inner worldly beings in general...Thus anxiety takes away from Dasein the possibility of understanding itself, falling prey, in terms of the “world” and the public way of being interpreted. It throws Dasein back upon that for which it is anxious, its authentic potentiality-for-being-in-the-world (Heidegger, 2010, p. 187-188).

Therefore, anxiety is a state of mind and in that moment the world is alien and the individual no longer feels at home within the world (Gelven, 1989). This feeling of anxiety or dread shaped the way that the participants experienced being-in-the-world of implementing a high fidelity program and highlighted a sense of struggle for them.

Technological readiness impacted not only on the nurse academics when implementing the program, it also affected the student learning experience. In some cases, the physical space for the high fidelity simulation sessions was not yet completed, and, in others, although they had newly built facilities, there were a still
a number of technical problems present. Lived space, according to van Manen (1997) is ‘felt space’ (p.102) and this affects the way an individual feels. Lived space for the participants elicited feelings of frustration and anxiety due to the unfinished physical space and the technical difficulties that they encountered when conducting a high fidelity simulation session. For the participants at this time the technology became prominent and in the foreground, as it was not running smoothly and effectively and the student experience faded into the background. These circumstances lessened the effectiveness of the high fidelity simulation session. For the high fidelity simulation session to be a positive learning and teaching tool the technology should be ‘ready to hand’ with the equipment remaining in the background functioning in an unobtrusive manner so that the nurse academic is able to focus on the educational experience for students (Heidegger, 2010; Jeffries, 2008). Moreover, Taplay et al. (2015) suggested that when the simulation equipment or the physical space is not completed a feeling of dissonance is created between academic staff expectations and the reality of the situation during implementation. Further to this, Issenberg (2006), noted that it is essential to have the necessary physical space and equipment function correctly or an effective teaching and learning session in simulation will not occur.

This sense of struggle also impacted in the area of lack of human resource support for the nurse academics in the program. The participants further highlighted their feelings of anxiety and isolation when facilitating a high fidelity session without technical assistance. Again, the technology came into the foreground for the participants due to their feelings of unease when using the equipment and facilitating students within the simulation session without technical assistance.
The technical support staff employed in the nursing laboratory area where the high fidelity spaces were situated were not engaged in the high fidelity simulation program. Their job description involved ensuring that the nursing laboratories were well equipped and functioned in an efficient manner for the nursing practice units. There had been no staff training for the technical staff in regards to high fidelity simulation technology and it was not incorporated into their job description.

The academic advisor for clinical education identified that the lack of technical assistance in the high fidelity simulation sessions for nurse academics was a major impediment in the successful implementation of the program. She felt that it was unreasonable to expect the nurse academics to be experts in the use of the technology. This finding is strongly supported by Arthur et al. (2011) who asserted that to enable successful implementation of a high fidelity simulation program, it is essential to have a dedicated staff member to coordinate the technical aspects of the high fidelity mannequin programming and its use. Furthermore they suggested that, the inclusion of a technical support person could focus on the smooth running of the technological aspects of the session allowing the nurse academic to facilitate a positive learning experience for the students. The importance of dedicated technical staff assistance to ensure an effective high fidelity learning experience has been well documented in the simulation literature (Arthur et al., 2011; Howard, Ross, Mitchell, & Nelson, 2010; Jansen et al., 2009; Jeffries, 2008; King et al., 2008; Tuoriniemi & Schott-Baer, 2008). In addition, King et al. (2008) reported in their study that academic staff would increase their usage of high fidelity simulation if they had additional assistance from laboratory personnel.
A number of participants in this study also believed that this perceived lack of support from the technical staff may be due to a lack of confidence and fear of technology. These findings, were similar to those of Irwin (2011) who indicated that fear of the unknown and lack of awareness of technology made staff feel intimidated and therefore an avoidance of simulation technology was evident. A lack of flexibility and resistance to learning new skills or changing work behaviour was suggested by one participant in my study, as a reason for the technical staffs’ lack of engagement with the high fidelity program. Adamson (2010), suggested that barriers to resistance and fear of technology may be overcome by allotting paid hours for academic and technical support staff to become familiar with the technology, plan and implement simulations. Leigh (2011), also contended that in order to improve uptake, adequate training on the use and maintenance of the high fidelity technology should be provided by management.

7.2.3 Dissonance in the learning environment

Dissonance in the learning environment was another minor theme to emerge from the sub theme, a sense of a struggle. Dissonance can be defined as “inconsistency between the belief one holds or between one’s actions and beliefs” (Dissonance, 2015). The participants felt dissonance within the high fidelity environment not only with technology but also with creating a positive learning environment for students. The participant’s lived experiences of struggle and anxiety in this minor theme dictated how they experienced their environment, facilitated their high fidelity sessions and interacted with their students. The existentials of lived time, space, body and human relations can be seen to be problematic for the participants in the high fidelity simulation learning environment (van Manen, 1997).
Lived relations for the participant’s being-in-the-world of the high fidelity simulation program when implementing a high fidelity session was challenging. It became evident that for the majority of the participants large class sizes impacted on the lived human relations between the nurse academic and students. The nurse academics identified that the ratio of one teacher to twenty five students and in some cases twenty eight students affected the consistency of the learning experience and supervision of student learning. Another concern highlighted by the nurse academics was the maintenance of a safe learning environment within the high fidelity simulation sessions as a large number of students were practising unsupervised. The participants shared feelings of lack of support as they had no assistance during these sessions.

Lived space for the participants at this time also elicited feelings of anxiety as the physical layout of the nursing laboratory area was not positioned in close proximity to the high fidelity simulation space. This created a huge logistical dilemma when facilitating a large class as the nurse academic needed to supervise the high fidelity simulation session as well as the remaining students in a separate location. This situation increased feelings of dissatisfaction for the nurse academics as educators and the concept of lived body became problematic for them as they could not assist students in both areas. According to van Manen (1997), lived body “refers to the phenomenological fact that we are always bodily in the world” (p. 103).

Further to this, the large number of students and the location of the high fidelity simulation room created inconsistencies in the way that the nurse academics conducted their classes. Therefore, not all students experienced the same
opportunities in this learning space. In some classes, students were assigned self-directed activities in the nursing laboratory area while their classmates were participating in the high fidelity simulation exercises. In other classes, the students were supervised in the high fidelity control room and unable to undertake self-directed activities. There was also a huge variation in numbers of students actively participating in the high fidelity sessions with one nurse academic taking their whole class into the high fidelity exercise. Participants also highlighted the lack of educational value when leaving students unsupervised as they were able to ‘design their own adventure’ and walk in and out of class at whim. It was apparent from these accounts that the facilitation of the classes and hence the student learning experience during the high fidelity sessions was haphazard and highly inconsistent. Similarly, findings from studies by Jansen, Berry, Brenner, Johnson, and Larson (2010), Jansen et al. (2009) and King et al. (2008) suggested that large class sizes are problematic and simulation is more effective with limited numbers. The difficulties of large student numbers is further highlighted by Miller and Bull (2013) who indicated that large student numbers and small simulation spaces increased pressure on nurse academics.

Arthur et al. (2011) in a cross-sectional survey on human patient simulation manikins and information communication and technology use in Australian Schools of Nursing found a large variation in student numbers involved in simulation exercises. Their findings indicated that the numbers of students who were actively involved in the high fidelity simulation at one time ranged from two to thirty with a median of four and a half. It was interesting to note, that they could not identify the role allocation of the students in classes with large numbers and some students
acted as observers in the control room (Arthur et al., 2011). These findings are similar to the findings of this study as it was difficult to differentiate the numbers of students that participated or identify their roles.

Lived time within the high fidelity sessions for a number of the participants created a sense of struggle not only with the logistics of coordinating students but also with time to adequately brief students prior to the session and debrief them following the exercise. In addition, not all students were given the opportunity to participate in the high fidelity simulation exercise due to time constraints. A lack of a detailed educational plan or guidelines to assist the nurse academics with the coordination of the sessions in regards to student numbers, briefing and debriefing prior to the implementation of the sessions was evident and the majority of the participants believed that this further added to the lack of consistency in the student experience.

Many of the participants highlighted the importance of debriefing students following a high fidelity learning exercise. A small number of participants were able to incorporate debriefing in their sessions but this was inconsistent and they were not able to identify a clear structure or plan for conducting an effective debrief session. One participant voiced feelings of overwhelming frustration when coordinating a large class and completing all the components of the simulation. Lived time for her elicited feelings of a struggle as she found debriefing within the time constraints was unachievable although she felt strongly that it was the most important part of the simulation. These feelings were also supported by many of the other participants.
The importance of debriefing following high fidelity simulation learning exercises has been highlighted by numerous scholars such as Garrett, MacPhee, and Jackson (2010), Jeffries (2005), Leigh and Hurst (2008), Lau (2010), and Johnson-Russell (2010). Seropian (2003), suggests that the core element of debriefing should involve the ability of the facilitator to uncover and stimulate learning in a non-threatening way. He suggested that debriefing is as important as the simulation exercise itself and believed that learning occurs from not only critical self-analysis but also from discussion with others (Seropian, 2003). Similarly, Waznonis (2014) contended that debriefing is the most important aspect of simulated learning. She asserted that there are a number of different methods involved in debriefing following simulation and the important aspect for nurse academics to strive for is consistency between the theory, design, use and evaluation of the method used. She further suggested that the terms, debriefing, feedback and reflection are not interchangeable and again for consistency within the simulated learning experience it is important to clarify these terms. This is important to note as the findings in this current study indicated inconsistencies with the theory, design, and evaluation methods used as well as inconsistencies in terminology. In addition, Ravert (2010) contended that in order to enhance effectiveness of a facilitator led debriefing session, facilitators require prior education in the principles of debriefing as well as practice with, and support from, a more experienced faculty colleague. The participants in this present study did not have the opportunity for prior educational preparation or practice in debriefing prior to the facilitation of their sessions.
7.2.4 Feeling Engaged

This sub theme highlighted the lived experiences of the participant’s feelings of engagement within the simulation program. For a number of the participants, the lived human relations between the students and the nurse academics whilst being-in-the-world of a high fidelity simulation learning exercise provided a positive experience for them. They believed that it provided opportunities for students to learn in a safe environment and the level of student engagement and excitement within the high fidelity sessions gave the nurse academics motivation. Another source of encouragement for the participant’s feelings of engagement in the high fidelity program came from their perception that this type of learning enhanced critical thinking and reflection in action for students. Overall, the participants reported that the students loved the high fidelity simulation exercise and this gave the nurse academics a sense of satisfaction. These findings are similar to the large body of simulation literature relating to student satisfaction. Student perceptions surrounding their participation have been overwhelmingly positive (Alfes, 2011; Baxter et al., 2009; Reilly & Spratt, 2007; Starkweather & Kardong-Edgren, 2008).

7.3 A high fidelity simulation program three years on: a fractured journey

*The Road goes ever on and on*
*Down from the door where it began.*
*Now far ahead the Road has gone,*
*And I must follow, if I can,*
*Pursuing it with eager feet,*
*Until it joins some larger way*
*Where many path and errands meet.*
*And I whither then? I cannot say*

*(Tolkien, J.R.R. p.97)*
And so begins the next stage three years after the commencement of the high fidelity program. *Being-in-the-world* of introducing, adopting and implementing a high fidelity simulation program for the participants had not been smooth and the term a ‘fractured journey’ is used as a metaphor to illustrate their experiences. For the participants the essence of their journey had been one of altered time or temporality whereby they felt that the implementation of the program had been slow. Lived human relations between the members of the high fidelity simulation teaching team were also complicated and provided feelings at times of elation and at other times disillusionment for the participants. For many, the challenges and obstacles that were evident three years previously, still remained.

The major theme- ‘*a high fidelity simulation program three year on: a fractured journey*’ is presented with sub-themes and minor themes that represent the phenomenon from different perspectives. The first sub theme to be discussed is *encountering obstacles*, with minor themes *a diverse workforce* and *academic staff buy in*. The second subtheme that was uncovered related to *technological investment versus human investment*.

### 7.3.1 Encountering obstacles

The existential theme of lived human relations was prominent in this sub theme as it became evident that the complexities of relationships between the various nurse academics working within the program had a profound effect on the way the program was implemented and its level uptake across the nursing practice units (van Manen, 1997). The intricacies and implications of this relationship are explored through the minor themes: *a diverse workforce* and *academic staff buy in*. 
7.3.1.1 A diverse workforce - concerns for consistency and quality of the program

The impact of a diverse workforce and its negative influence on the educational experience for students emanated from the voices of the participants. For the majority of the participants, the large casual workforce had been identified as a concern in regards to the quality and consistency of the educational program in stage one of the study. However, over time it had become a dominant area of concern for them.

A number of participants highlighted that at least fifty per cent of the academic teaching workforce in the School of Nursing and Midwifery were employed on a casual basis. One participant suggested that eighty per cent of the overall teaching staff in the nursing practice units which included the high fidelity simulation program were casual employees.

The large casual workforce whilst identified as problematic by the participants in stage one, was highlighted as a large obstacle in the creation of a cohesive teaching team in stage two. As a result, the participants perceived that the potential for lack of consistency and quality of the learning experience for students within the high fidelity simulation program had increased significantly. These findings are similar to Arthur et al. (2011), in their investigation of clinical laboratory staffing and staff responsibilities for simulation and technology in Australia. According to Arthur et al. (2011), 75% of nursing schools employed some casual laboratory teaching staff and, indeed, 17% of nursing schools had all clinical laboratory teaching done by casual staff. They contended that this high level of casual workforce teaching in the clinical laboratory setting, can be problematic for the learning experiences of
nursing students (Arthur et al., 2011). In addition, they indicated that in an Australian context, the casual clinical laboratory teachers are often nurse clinicians with less post graduate qualifications than full time nurse academics. Therefore, there may be a direct impact on the quality and consistency of the simulation program due to insufficient academic skills of the casual academic to adequately support student learning (Arthur et al., 2011).

This finding is further supported by Halcomb, Andrew, Peters, Salamonson, and Jackson (2010) in their discussion paper on the casualisation of the teaching workforce in nursing. They clearly identified that a casual workforce provides diversity of teaching and professional experience, however, this diversity is not clearly articulated as there is minimal literature that adequately describes the academic and professional profiles of the casual staff members. There is also concern voiced by nurse academics that casual staff members may be recruited with limited knowledge of adult teaching and learning principles (Duffy, Stuart, & Smith, 2008; Halcomb et al., 2010). In another study Peters, Jackson, Andrew, Halcomb, and Salamonson (2011) contended that full time nurse academics considered casual staff members on the whole, were ill equipped to teach in an undergraduate nursing program. Halcomb et al. (2010) suggested that this may be due to the fact that they are often employed reactively or on an ad hoc basis purely to fill a teaching vacancy and are often not subject to the stringent recruitment processes required of permanent full time academics.

Inherent to the problem of a large casual workforce teaching in the high fidelity simulation program in this study, were the difficulties associated with orientation
and educational preparation. A scheduled educational preparatory workshop had been formalised with an expectation that all staff would attend, however this had only occurred over the last six months of the study. Even so, due to the diversity of the workforce, not all casual staff attended or if they did the workshop may not have been scheduled prior to their high fidelity simulation teaching session. Job commitments in other employment areas were presented by some of the participants as a valid reason for the casual staff not attending or delaying attendance at the workshops. This is a common finding according to Duffy et al. (2008), who commented that casual staff also work at other jobs which makes it difficult to find common times for meetings. Therefore the quality and the consistency of the educational delivery within programs may be impaired. Peters et al. (2011), also highlighted the difficulties that arise from the employment of a large casual workforce which included poor attendance at orientation sessions and team meetings, which then had a flow on effect on the consistency of educational information given to students.

It was apparent in this study that the lack of adequate educational preparation for casual staff could have a direct impact on the student learning experience as they may not possess the knowledge base to effectively coordinate a high fidelity session. In some cases, the scheduled high fidelity session for students was omitted due to lack of adequate preparation of the casual staff member. In addition, it was evident that the preparation of a large casual work force in the high fidelity area markedly increased the workload for the academic advisor for simulation. This is consistent with the work of Peters et al. (2011) who found that the employment of a large casual workforce had implications for the workload of continuing full time
academics. They found that the workload was increased exponentially for continuing staff members as they tried to maintain quality teaching and learning and equity among students, as well as provide guidance and support for casual teaching staff.

A further implication of lived human relations between the casual work force and the continuing staff members was identified by one of the participant in the study. She suggested that if the continuing staff members did not provide leadership and demonstrate the attributes of a positive role model within the high fidelity simulation program, the motivation of casual staff members to incorporate this new innovation into their teaching may be diminished. Halcomb et al. (2010), and Jackson, Peters, Andrew, Salamonson, and Halcomb (2011) suggested in response to this problem that an academic staff mentoring program should be established and implemented to support and provide leadership to casual staff as an ongoing process to improve the consistency of the educational experience for students. Yet another obstacle mentioned as a minor theme, was problems with staff buy in.

7.3.1.2 Academic staff buy in

Inconsistency with academic staff buy in from the unit coordinators emerged as a significant issue from the narratives of the participants. This inconsistency created a barrier to the uptake of the high fidelity simulation program. The lived experience for the academic advisors and the other participants as a result of inconsistency with academic staff buy in was one of frustration and disillusionment. The academic advisors for clinical education experienced feelings of slowed time or temporality as the high fidelity simulation program had not progressed to a place where they
would have liked it to be within the three year period. Lived human relations between the academic advisors, the unit coordinators and other nurse academics teaching in the program were problematic as the communication channels between them were poor and the uptake of the high fidelity simulation program into units of study by the unit coordinators was inconsistent.

Further reflection on this phenomenon uncovered potential reasons for these inconsistencies and resistance from the unit coordinators. The following issues will be explored to find the essences of meaning for this resistance to uptake, focussing on the following areas: lack of education and awareness of high fidelity simulation, change in pedagogy and resistance to change, increased academic workload and the introduction of high simulation learning as a low priority or an optional extra.

When exploring the notion of resistance to uptake amongst the cohort of unit coordinators, the level of educational preparation and prior awareness of high fidelity simulation learning must be revisited. Prior to the introduction of the high fidelity simulation program only one staff member had substantial experience with pre-registration nursing students using high fidelity simulation learning. The teaching focus within the nursing practice units was largely skills based with the use of low fidelity simulation mannequins. Therefore, the introduction of high fidelity learning for the majority of the nurse academics in this area was a marked change from their everyday teaching practices. The preparation for unit coordinators was the same as for all members of staff in the nursing practice units. There was email communication from the academic advisors for simulation in regards to workshop preparation in the initial stages of the program and follow up workshops in
subsequent semesters. However, these workshops focussed on the technical aspects of facilitating a high fidelity simulation session and not on the theoretical underpinnings or the change in focus of pedagogy to enable understanding of the new innovation.

Therefore, whilst acknowledging the unit of study coordinators’ academic experience and expertise in teaching clinical skills, it must be noted that high fidelity simulation learning was a distinct change from their traditional teaching style. High fidelity simulation has been described as an innovative educational initiative with a change in focus from traditional methods of teaching which requires the nurse academic to educate students in a different way (Howard et al., 2010; Smitten, 2013; Starkweather & Kardong-Edgren, 2008). It focuses on the learning experience of students, changing the form of pedagogy from teacher centred to student centred learning. The nurse academic becomes a facilitator, collaborator and evaluator (Childress et al., 2007; Seropian, Brown, Gavilanes, & Driggers, 2004).

This change in pedagogy may be associated with the unit coordinators lack of buy in. According to Pardue, Tagliareni, Valiga, Davison-Price, and Orehowosky (2005), nursing education is challenged by resistance to change which is a major reason for lack of awareness and uptake in innovation. In addition, Adamson, (2010) and King et al. (2008), found that nursing faculty have reported apprehension when expanding their teaching methodology to incorporate high fidelity simulation learning. Akhtar-Danesh et al. (2009) asserted that nursing faculty members may also fear judgement from peers due to inadequacy of knowledge when a new pedagogy such as simulation learning is introduced. In addition, Hughes (2005)
asserted that a key determinant for uptake by academics in new technology is the presence of a clear connection between their teaching and the innovation. Furthermore, “the power to develop innovative technology-supported pedagogy lies in the teacher’s interpretation of the technology’s value for instruction and learning in the classroom” (Hughes, 2005, p. 297). This interpretation acknowledges the academics' past experiences and their knowledge base as teachers (Hughes, 2005). This assertion fits with Heidegger’s (2010) concept whereby interpretation is the uncovering of possibilities projected by understanding and that the individual can see the technology as ‘ready-at-hand’.

Another significant concern uncovered by the lived experiences of the participants, was the lack of team consultation between the unit coordinators, the academic advisors, and the teaching teams. It appeared that the unit coordinators could opt in or out of the high fidelity simulation program and therefore, in some units of study, high fidelity simulation was not used at all. This lack of consistency in the program created an overwhelming sense of frustration and concern in the participants. Hagner & Schneebeck, (2001) indicated that universities, due to their tradition bound nature, allow latitude in the name of academic freedom with regard to the adoption of new technological innovations. However, pressure from students and market forces will present a considerable challenge to this autonomy in the future (Hagner & Schneebeck, 2001). Taplay et al. (2014b), in their study on organisational culture and the adoption of simulation and nursing, also found that the concept of academic freedom provided challenges for nursing programs when adopting an innovative technology such as high fidelity simulation which requires extra workload and teamwork.
The perception of increased workload in high fidelity learning program was also suggested by two participants in this study as a potential barrier to uptake by the unit coordinators. This finding is supported by research by Hanberg (2008) as nurse academics in his study indicated that they were already overwhelmed by an extensive workload and the addition of another requirement such as learning how to utilise and integrate high fidelity simulation learning created feelings of overload. Similarly, this finding is also supported in studies by Miller and Bull (2013), Jansen et al. (2010), and Adamson (2010).

Rogers (2003), in his diffusion of innovation theory, suggested that for successful adoption of an innovation to take place, it is largely contingent on past or prior experiences. This connects with Heidegger’s assertion that with every interpretation there is fore-having, fore-sight, and fore-conception. This is based on Dasein’s use of the world as ready-at-hand (Gelven, 1989). Heidegger (2010) suggested that we carry our past with us and are always ready to understand ourselves and our projects in terms of the past. However, at the same time, we are immersed in the present as we are part of the world which connects us to everyday happenings (Gelven, 1989).

When considering the unit of study coordinators, their past experiences may have lacked sufficient knowledge, awareness and understanding surrounding high fidelity simulation to enable this innovative program to be ‘ready to hand’ and useful to them (Heidegger, 2010). Rogers (2003) contended that in order to introduce an innovation the process involves five stages: knowledge, persuasion, decision, implementation and confirmation. Prior conditions which increase the chance of
adoption of an innovation include previous practices, felt need, innovativeness and norms of the social system within the organisation (Rogers, 2003). He also suggested that time is an important factor in regards to the uptake of an innovation. The individual or group requires time to access information about an innovation, time to use the information and time to enable the decision to be made as to whether to adopt or reject the innovation (Rogers, 2003).

For the participants, lived time in the introduction, adoption and implementation of a high fidelity simulation program had been a three year journey to this point. To better understand the phenomenon, Rogers (2003) five stages of innovation will be applied from the perspective of the unit coordinators. The first stage of an innovation is called knowledge acquisition and has three components. The first component awareness-knowledge was evident at this time as the unit coordinators were aware of the existence of the high fidelity simulation program. The workshops that had been provided encompassed the technological aspects of the program and it could be proposed that part of how-to knowledge had been offered however, the educational preparation for nurse academics on how to facilitate a high fidelity session for student learning had not been part of their preparation and so this aspect of how-to-knowledge was incomplete. It was also evident that the unit coordinators had differing levels of nursing academic experience and according to one participant some of the less experienced unit coordinators were not experienced enough to realise their knowledge deficits. The last component of knowledge acquisition is principles-knowledge which is the knowledge necessary to uncover the underlying principles of how the innovation works (Rogers, 2003). This kind of knowledge was not uncovered in the findings from the narratives of the
participants. It is clearly evident, that the knowledge of participants prior to the adoption of the high fidelity simulation program had deficits when analysed from the perspective of Roger’s diffusion of innovation theory. This knowledge deficit may have been a barrier or obstacle to the uptake of this innovation.

The persuasion stage is the second stage in the diffusion of innovation theory (Rogers 2003) and is reliant on the knowledge base of the individual to enable an opinion to be made about the innovation. This stage is integral to the uptake of an innovation and will be discussed in the context of the unit coordinators perceived resistance to uptake of the high fidelity simulation program in this current study. In the persuasion stage, the nurse academic must consider the attributes of the innovation. These attributes include relative advantage, compatibility, complexity, trialability and observability. Relative advantage is the degree to which the innovation is perceived to be superior to the current practice. Compatibility refers to how consistent the innovation is with past experiences, values and needs. Complexity relates to the difficulty of understanding and using the innovation and trialability is the degree to which it can be trialled to see its fit prior to implementation. Observability is the visibility of the results of the innovation as observed by others (Rogers, 2003; Starkweather & Kardong-Edgren, 2008). However, in this current study it has been identified that the unit coordinators knowledge base was limited and therefore the processes that are required for the individual to travel through in the persuasion stage were fractured and hence a perceived negative attitude may have been adopted towards the innovation from a number of the unit coordinators.
Another potential barrier to the uptake by unit coordinators may be attributed to the fact that the third stage, the decision making stage, had already been made prior to the commencement of the program. It is evident that the decision making stage or commitment for adoption came from senior management prior to the knowledge and persuasion stages for the participants and this also could be identified as a potential barrier for adoption. The lived experiences of the participants during the implementation stage had been a fractured journey and the confirmation stage of Roger’s theory could be considered as a ‘fait accompli’ for the participants. It was apparent from the narratives of the participants that the pathway for a positive diffusion of innovation according to Roger’s theory (2003) was not present and the implementation of the high fidelity simulation program had been a fractured and ad hoc process.

In this subtheme the lived experiences of the participants encompassed feelings that were both positive and negative and epitomised the fractured journey that they had travelled to this point. An overwhelming feeling of optimism emerged from the participants when discussing the embedding of simulation learning within the new curriculum at the School of Nursing and Midwifery. The presence of simulation learning into the new curriculum and increased student hours in the nursing laboratory program was considered by one participant as a significant achievement for the high fidelity simulation program. The importance of integrating a simulation program into the curriculum is documented by scholars such as Kerner (2010) and Arthur, Levett-Jones, and Kable (2013) who acknowledge that a well-planned integration is paramount to the success of a simulation program. Taplay et al. (2015), also contend that high uptake of simulation learning was evident in
nursing programs that had planned and integrated simulation learning into their curriculum. In addition, Taplay et al. (2014b) asserted that nursing faculties that achieved a high uptake from faculty in high fidelity simulation learning utilised the vision and mission statements of the organisation to effectively plan, integrate and situate simulation learning within the curricula (Taplay et al., 2014b).

The acknowledgement that the high fidelity program was a significant initiative in the eyes of the university was also important for the participants. For one participant, this acknowledgement created a sense of excitement and achievement that the work that she had done in the high fidelity simulation program had been appreciated. Taplay et al (2015) also found that uptake of simulation learning improved in institutions where the work that was done in regards to high fidelity simulation was recognised and publicised (Taplay et al., 2015).

7.3.2 Technological investment versus human investment: a lack of congruence

It was evident that there had been substantial investment from the School of Nursing and Midwifery and the University for the purchase of the technological equipment necessary to run an effective simulation program as well as the provision and renovation of the physical space. The participants felt that the Dean had been very supportive with funding for equipment and that the School of Nursing and Midwifery had also applied for and been successful with university funding grants. One participant suggested that ‘the equipment, the technology is here. We’ve got it all’ but this was where her enthusiasm ended and she indicated her frustration with the teaching and learning effectiveness of the program. She was not alone and a number of other participants expressed concern at the lack of
progression of the high fidelity simulation program as if there was a divide between technological resources and human resource support.

This disconnect is not uncommon in the simulation literature and Seropian et al. (2004), stressed the importance of the development of a vision for an innovation such as high fidelity simulation adoption should be guided by a business plan. An effective business plan encompasses the direction the faculty will take as well as basic governance and budgetary constraints. They recommend factors such as staff training, curriculum development, the role of a simulation and debriefing facilitator to be considered. Irwin (2011, p. 158), suggested that “it is not enough to purchase equipment and tell faculty they need to use it without the education and support to do so” McGarry, Cashin, and Fowler (2014), surveyed Australian Schools of Nursing and use of human patient simulation. Their findings indicated an ad hoc response to the adoption of human patient simulation with an emphasis on the physical resources required. They also found little emphasis on the importance of the human resource in regards to staff development and implementation time. This finding is consistent with findings by Jansen et al. (2009) whereby human resource allocation was insufficient “to run equipment, provide clinical supervision and manage the mannequin lab” (p.12).

It is evident upon further examination of the participant’s lived experiences that they were dissatisfied and disillusioned with the lack of human resource support and infrastructure provided within the program. One participant stressed that the program was not being developed to its full capacity because of the inadequate human resource support. A dissertation by Duvall (2012), concurred with this
statement, warning against the lure of technology without adequate human and physical resources to effectively utilise the equipment. Taplay et al. (2014b), supported this finding suggesting that nursing programs cannot afford to purchase expensive equipment without using it to its fullest capabilities.

In the early stages of the implementation of the program the academic advisor for clinical education identified the need for further technical support for the academic staff when implementing high fidelity learning exercises with students. She applied to the Dean for a designated technician to assist with the simulation program, however, it was declined. Instead, management offered the technical staff an increase in their job position level if they opted to assist in the simulation program. However, there was no increase in staff numbers and therefore the workload for the technical staff member would have increased if they applied for the higher level position. At this stage, no staff member had accepted the offer and therefore three years into their journey the nurse academics were still coordinating the simulation exercises with minimal support from the technical staff.

The lack of support from technical staff during high fidelity learning exercises was highlighted at the commencement of the study as a source of increased anxiety for participants and it was also identified as a deterrent to the uptake of the program. However, this problem was still evident in stage two. The importance of a designated technical staff member for successful implementation of a high fidelity simulation program has been highlighted in the literature by numerous scholars such as Jones and Hegge (2007), Adamson (2010), Jansen et al. (2009), King et al. (2008), Tuoriniemi and Schott-Baer (2008), Engum (2014), Howard, Englert, Kameg,
and Perozzi (2011) and Akhtar-Danesh et al. (2009). Jeffries (2008), stressed that it is imperative that Deans and Directors recognise the need for administrative support in the use of this innovation. According to Smitten (2013), trained simulation technicians are essential to ensure proper operation of the high fidelity technology. Moreover, she found that if the nurse academics focus was on the technical equipment, the teacher learner focus was lost and this created an increased sense of anxiety for the academic (Smitten, 2013). This finding is identical to the feelings portrayed by the participants in this study.

One participant stressed the importance of investment in human resources and suggested that management within the School of Nursing and Midwifery were short sighted. She believed that if you invest in human resources to support the program, student learning outcomes will be higher. Taplay et al. (2015) also acknowledged an essential component for the successful adoption of a high fidelity program is the establishment and maintenance of a specific budget for simulation from nursing administrators and institutional leaders.

The participants in this study found that it was not only the lack of technical support that was challenging when implementing high fidelity simulation learning it was also large student numbers that created further dissatisfaction within them. Although student numbers in some units of study had decreased the numbers were still at a ratio of one nurse academic to between twenty to twenty five students. The nurse academics found that their role within the simulation session untenable as they were required to facilitate the students in the high fidelity area, manage the technological equipment as well as supervise the students in the nursing laboratory.
space which was located in a different location to the high fidelity room. In addition, they were required to debrief the students following the simulation exercise. In a recent study examining quality indicators for the design and implementation of simulation experiences, Arthur et al. (2013), highlighted the importance of adequate staffing in the high fidelity learning experience for students. This feeling of dissatisfaction with the lived human relations caused by large student numbers was further supported by King et al. (2008), who suggested that simulation learning is only effective with limited numbers of students. Jansen et al. (2010), also support this finding. However, Arthur et al. (2013) indicated that recommendations regarding adequate group sizes and role allocations were inconclusive. Although, in this current study the lived experiences of the participants found the large class sizes and lack of support distressing. According to one participant, the presence of an additional academic staff member during the simulation exercise would allow consistency when debriefing students and effective facilitation of students in the nursing laboratory.

For the participants, the lived space of this environment due to the physical disconnect between the high fidelity room and the nursing laboratory room where the majority of students were practising was also anxiety provoking and created feelings of dissonance for them. According to van Manen (1997), lived space affects the way that we feel and this space created feelings of anxiety for the participants. Additionally, Taplay et al. (2015), believed that the influence of physical space can influence the individuals’ adoption of an innovation. It is more than the location, but the meaning or understanding that the person attributes to that feeling of space as an organisational element at that time.
Another division between technological investment and human resource investment that was uncovered from the participant’s lived experiences was one of leadership. One participant discussed the need for a champion, whereas another participant suggested a curriculum director. Senior management from the outset of the program had identified the need for a leader and created the role of academic advisor for simulation. However, to operationalise this role the academic advisor for clinical education was expected to implement the high fidelity simulation program with a workload allocation of one day per week. The academic advisor also had additional responsibilities within the clinical education program. Sarah, the first academic advisor believed that this workload allocation was unrealistic, unreasonable, unachievable and one of the main reasons why the uptake of simulation learning has been so slow.

Scholars such as Griffin-Sobel (2009), Griffin-Sobel et al. (2010), and Katz, Peifer, and Armstrong (2010) have identified the importance of a champions to develop expertise of other staff members and increase the uptake of high fidelity simulation learning. Similarly, Livesay, Lawrence, and Miller (2015) indicated the importance of a simulation coordinator to instigate the change process. Adamson (2010), also suggested that the appointment of a full time coordinator would increases the consistency of high fidelity simulation across the curriculum. In addition, Jones (2008) identified the need for release time for faculty members to allow time for planning and implementation at a team level.

However, according to Taplay et al. (2015), the identification of a champion is not enough for a smooth and effective adoption of high fidelity simulation across the
curriculum. They suggested the concept of ‘leaders working in tandem’. This concept suggested the development of a new role of leader to facilitate the integration of simulation across the curriculum. The key to this role development was working in tandem with administration as it allowed the task of adoption and incorporation to be approached from a number of perspectives. “All levels of the organization shaped this phase because it involved workload, reallocation of personnel, and new role development” (Taplay et al. 2015, p.76). Taplay et al. (2014a), also found that nursing administrators from areas that had high uptake of high fidelity simulation across their curriculum had the insight to realise that there needed to be a shared responsibility between nursing administration and the identified simulation leader. They also identified that for the simulation leader to be successful they needed to be given a certain level of responsibility and decision making powers.

In this study, it was evident that senior management had identified a need for a simulation leader however, according to the lived experiences of these designated leaders they were not given adequate time to engage adequately with the implementation of the program. Additionally, they were not given decision making powers and the power rested with the management as was clearly evident when one participant applied for a designated technician to assist with the high fidelity simulation activities and this was declined. This lack of power was also visible in regards to the implementation of high fidelity simulation learning activities within the nursing practice units where the unit coordinators were able to opt in or out of the assigned activities with no apparent accountability. Taplay et al. (2014a), contended from their findings that the role of the simulation leader is crucial to the
process of adopting and incorporating simulation learning across the nursing curriculum.

7.4 Conclusion

In this chapter, by illuminating the phenomenon of the lived experiences of the participants during the introduction, adoption and implementation of a high fidelity simulation program, three major themes being-in-the-world of imposed change, being-in-the-world of implementing a new program and a high fidelity simulation program three years on: a fractured journey have been discussed to provide a deeper insight into the participants journey. In keeping with van Manen’s (1997) view of the nature of data, textual sources were used in this final interpretation of the participant’s experiences to provide further insight and understanding of the phenomenon. In the next chapter further reflection of the phenomenon will be presented as a conclusion to the study. Insights from the study and strengths and limitations and recommendations for further research will also be discussed.
Chapter 8: CONCLUSION

In this chapter a summary of the findings and conclusions are discussed. Limitations of the study and recommendations for successful implementation of a high fidelity simulation program and future research are presented.

In this thesis I explored the phenomenon of being a nurse academic when introducing, adopting and implementing high fidelity simulation into a nursing program. Consistent with its aim, this study provided deep insights into the experiences of the nurse academics throughout the three year period of implementation of the program. The narrative accounts and reflections of ten Australian nurse academics in stage one of the study and five nurse academics in stage two, offers rich descriptions of their journey. Hermeneutic phenomenology provides the philosophical framework for uncovering and interpreting these experiences. The choice of hermeneutic phenomenology was a good fit for the study as it focusses on the lifeworld of the individual and allows their everyday experiences to emerge in a meaningful way.

The study uncovers a journey for the participants which at times did not run smoothly. The metaphor ‘a fractured journey’ emerged as part of the theme in the second stage of the study and depicts the participant’s experiences during the three year period. Many emotive descriptors such as angst, anxiety, frustration, satisfaction, feelings of engagement, powerlessness and disconnection were revealed to elucidate the lifeworld of the participants during this time.
Aspects that helped or hindered the introduction, adoption and implementation of a high fidelity simulation program in a large multi campus university in Australia were uncovered and will be discussed in this chapter under the following headings: Leadership and planning, faculty development and education, technology and human resources.

8.1 Leadership and planning

It was clear from the outset of the study that a vision for the high fidelity simulation program, a strategic plan and the role of the simulation leader were not clearly articulated. The findings and discussion chapters illustrate that the impetus for the high fidelity simulation program came from a senior member of staff and the dean of the School of Nursing and Midwifery. This senior staff member had a vision for the program but it was not adequately documented or clearly communicated to her successor prior to her departure from the university. It was evident that senior management had made a clear financial and educational commitment to the implementation of the program, however, there was no evidence of a strategic plan. According to Taplay et al. (2014b) nursing faculties that articulated a clear vision and strategic plan for the implementation of simulation learning into curriculum were more likely to have a high uptake of their program.

The Dean and senior management had identified the importance of a designated leader to establish the program, however, the workload allocation for this position was only one day per week. In addition the academic advisor had other roles and responsibilities within the clinical education portfolio. The role of the academic advisor in the development of the simulation program was extensive. It included:
supervising and advising with the building of the physical space to accommodate
the mannequins, advising on the technological set up within this space and
educating staff in preparation for the introduction of the program. She was also
responsible for the integration of the simulation program throughout the nursing
practice units.

The academic advisor at the outset of the program had minimal experience with
high fidelity mannequins and no experience with the facilitation of a high fidelity
simulation program however; there was an expectation that she would lead the
program. She received support from the dean to attend some external workshops
which enabled a beginning level of understanding of simulation learning.

Whilst the relationship between the academic advisor and senior management was
supportive in areas such as professional development, it was evident that the
workload allocation for this role was unrealistic making the task onerous. This
could have been one of the reasons for the slow uptake of the simulation program
over the three year period. The academic advisor could not effectively fulfil the
obligations of this role with only one day per week allocated. Indeed current
literature suggests that for successful implementation of an innovative program
such as simulation to be integrated into the curriculum a designated leader with
appropriate workload allocation is necessary (Livesay, Lawrence, & Miller, 2015;
Adamson, 2010; Griffin-Sobel, 2009; Griffin-Sobel et al., 2010).

The academic advisor had limited decision making powers and was not empowered
to employ extra staff that she deemed necessary for successful implementation of
the program. In addition, the unit coordinator and not the academic advisor, was
responsible for the content of their units of study. Therefore, if the unit coordinator felt ill-equipped or insecure about introducing high fidelity simulation learning into the unit, then this inhibited the role of the academic advisor to initiate a consistent simulation program across the nursing practice units.

The importance of shared leadership or leaders working in tandem has been suggested to increase uptake of simulation learning across the curriculum. Thus it is essential to have clear communication channels between senior management and the academic advisor who is responsible for the implementation of high fidelity simulation. It has also been highlighted that for the designated leader to be successful they need to be given a level of responsibility and decision making powers (Taplay et al., 2014a).

8.2 Faculty development and education

A lack of preparedness from an educational perspective was a strong subtheme that emanated from the voices of all participants from the outset of the introduction of the program. The reasons for this lack of preparedness were complex and numerous potential causes emerged from the findings. It was evident at the commencement of the program that only one participant possessed previous experience with simulation learning and therefore workshops related to high fidelity simulation were necessary in order to prepare the academic team for this implementation. The nurse academic team were familiar with the traditional teaching style of clinical skill teaching which was largely skills based and therefore the change of focus to student-centred learning with the role of facilitator,
collaborator and evaluator was a marked change in their teaching style (Childress et al., 2007; Starkweather & Kardong-Edgren, 2008).

Educational workshops were provided for staff by the academic advisor, however, these were poorly attended. This poor attendance at workshops was apparent in not only stage one of the study but also in stage two, three years later. Lack of educational preparation prior to the facilitation of simulation sessions in the nursing laboratories, raises concerns for the consistency of the learning experience for students in the nursing practice program. In addition, not all students received the same learning experiences as in some units of study, groups of students were offered the simulation exercise and others were not. Potential reasons for the lack of consistency related to staff ‘buy in’ of both permanent and casual staff members, changes in pedagogy, academic resistance to change, a perception of increased academic workload and the diversity of the workforce. The large percentage of casual staff employed in the nursing practice units was identified as a restriction to uptake and consistency, since they were often unable to attend workshops and hence were not adequately prepared for the task.

Furthermore, in stage one of the study, simulation learning activities were not embedded into the curriculum and therefore unit coordinators could opt in or out of incorporating simulation exercises based on personal preference. However, in stage two, simulation learning was embedded into the new curriculum document. However, in spite of this embedding, it was still evident that high fidelity simulation was not included in all units of study and this was still dependent on unit
coordinator preference. Therefore, it was apparent that inconsistencies of the learning experience for students in relation to simulation learning continued.

Another area that influenced the educational experiences for students and uptake by faculty was in the content area of the preparatory workshops. The workshops focussed on the ‘how to’ of technology use associated with the high fidelity mannequin and the audio visual equipment. However, there was an absence of educational preparation for the nurse academics in the introduction of simulation learning as concept, the underlying pedagogical principles or simulation design characteristics. These aspects have been suggested as essential when a implementing a simulation program (Jeffries, 2005). Therefore, the nurse academics were unaware of the critical aspects of scenario development, strategies for facilitating successful simulation sessions and the important aspect of facilitating a debriefing session following a simulation session. This educational deficit was highlighted as a potential reason for lack of input from the unit of study coordinators when requested to provide input into scenario writing.

According to current literature, in order for effective uptake of simulation learning to occur, nurse academics need to be educated not only in the technology, but in the underlying educational practices and the simulation design characteristics (Jeffries, 2005; Waxman & Miller, 2014). Indeed, Rogers (2003) suggested that effective diffusion of an innovation is dependent on the quality of the information that is delivered over time to the group that is required to adopt it.
8.3 Technological investment and human investment

“Equipment is purchased, the budget has blown, and faculties are not adequately trained” (Waxman & Miller, 2014, p. 10).

During the three year period there had been a substantial investment from the School of Nursing and Midwifery from university funding grants for the purchase of high fidelity mannequins and the setup of the surrounding technical area required to run the high fidelity simulation program on all campuses. At the outset of the program the participants struggled with technical problems and the physical space was not always fully functioning and ready for implementation. This scenario created heightened levels of anxiety for the nurse academics when facilitating sessions using SimMan®. In stage two of the study it was evident that the physical location to accommodate SimMan® had been completed at all campuses and that the equipment was state of the art. However, some technical problems remained but overall the technical equipment was fully functioning. The high fidelity area was now displayed as a showcase of innovation for the University. However, deficits were highlighted within the program in other areas. It was evident that there was a lack of a strategic plan to implement the program as an effective teaching strategy and optimise its potential. According to Seropian et al. (2004), it is imperative to have a business plan that encompasses the direction that the faculty will take, as well as basic governance and budgetary allocation. The focus of funding in the technical aspects of the program was evident, however, the funding of human resources to support the simulation program remained an inherent problem.
A sense of a struggle, feelings of frustration and dissatisfaction were highlighted by the participants due to lack of technical support during simulation sessions. This issue was evident at the commencement of the program and it remained a problem in stage two of the study.

Initially, the technical support staff were not included in the educational training sessions for the simulation program and technical assistance in the high fidelity sessions was not included in their job description. There was no clear strategic plan for implementation and the employment of extra staff or training of existing staff had not been initiated. The academic staff, during the high fidelity simulation sessions, felt isolated and frustrated as they had to manage the computerised equipment, facilitate the high fidelity experience and manage the remaining students in the nursing laboratory in another area. The nurse academics found this scenario untenable and were dissatisfied with their ability to provide a positive learning experience for students under these circumstances.

In stage two of the study there was little improvement in technical support for the academics. The technical staff had attended education sessions on simulation, however, it was still not part of their job description to assist with the technical aspects of the high fidelity program. The academic advisor for simulation had identified the necessity for technical assistance, but this was refused by senior management. The only assistance that was given to the academic staff was that the technical staff would switch the equipment on and off for the academic staff members. The need for technical support to ensure successful implementation of simulation learning has been highlighted in the literature by numerous scholars.
(Adamson, 2010; Jansen et al., 2009; Jeffries, 2008; Tuoriniemi & Schott-Baer, 2008). Smitten (2013), recognised that if the nurse academics has to focus on the technical aspects of the simulation then the teacher learner focus was lost.

Another area of dissatisfaction within the area of human resource support was highlighted in this study and this was in relation to large class sizes. Whilst the nurse academics in the study acknowledged that the students felt positive about high fidelity simulation learning exercises, there was also a concern that large class sizes impacted on the learning experience. Improvements in class sizes had been made during the three year period of the study, however, according to the participants the student to staff ratio was still inadequate. Some class sizes had been reduced from one facilitator to twenty students, but considering that the facilitator’s role required supervising students in the high fidelity session, managing the equipment and supervising the remaining students; this ratio was still unreasonable. Another issue impacting on this was the physical location of the nursing laboratories which were isolated from the high fidelity room making it almost impossible to supervise the students that were not in the high fidelity session. According to one participant, the students left unattended were able to ‘design their own adventure’. The nurse academics in this study stressed that this situation impacted on the student’s learning experiences during high fidelity sessions and increased their anxiety levels and left them feeling dissatisfied with the experience. In addition, debriefing, one of the essential components of the simulation exercise was often omitted because of time constraints as well as large student numbers (Jeffries, 2005).
In conclusion, this study has uncovered the lived experiences of nurse academics in the introduction, adoption and implementation of a high fidelity simulation program. For these nurse academics, the three year journey had been at times arduous, however, despite their difficulties they believed that simulation learning had positive benefits for improving pre-registration nursing students learning. Whilst improvements had been made within the program during this time, the uptake of simulation learning had been slow and the program has not yet reached its full potential as a positive educational strategy. In this study a number of significant issues related to faculty uptake have been identified and have helped shape significant recommendations to inform future nurse academics and management about the implementation of an innovative teaching and learning program such as high fidelity simulation.
8.4 Limitations

In this section potential limitations to the research method will be addressed:

This study explored the lived experiences of nurse academics when introducing, adopting and implementing a high fidelity simulation program in a school of nursing and midwifery in a large multi campus university in Australia. In qualitative studies, such as this study, issues of trustworthiness, rigor, credibility and resonance need to be addressed and this audit trail was clearly articulated in chapter 4 of this thesis.

The sample comprised ten nurse academics in stage one of the study and five nurse academics in stage two of the study. In hermeneutic phenomenological research the sample size is considered to be sufficient when the researcher is able to construct a deep and rich interpretation of the phenomenon (van Manen, 1997). However, the participants in the study were from a single university with a multiple campuses and were all female and this could be considered a limitation of the study.

The study participants provided a rich depth of description of the phenomenon. However, the inability to hear the voices of the unit coordinators because they did not volunteer for the study might be considered a limitation of the study.

Researcher bias can be considered a limitation of a study. Nevertheless, in keeping with hermeneutic phenomenological method my pre-understandings were made explicit. I also engaged in ongoing self-reflection throughout the research process and reflected following each interview, writing notes in my journal. I feel that this form of reflection enhanced my ability to understand my own values and assisted me with interpretation of the participant’s and prevented researcher bias.
Findings from this study related to the experiences of the study participants and it may be suggested that they are not generalisable to other areas. However, I would argue that the richness and depth of the findings have the potential for the reader to determine the relevance of their transferability to similar areas.

8.5 Recommendations

The findings from this thesis highlighted a number of barriers and challenges that need to be considered when introducing, adopting and implementing a high fidelity simulation program into a school of nursing and midwifery. The following is a summary of recommendations for successful implementation of a high fidelity program.

Firstly, a clear vision and strategic plan for the introduction of the program was absent in findings from this study and this was identified as a barrier to high fidelity simulation uptake. The importance of a clearly documented vision was highlighted as well as a strategic plan that documents all aspects of the introduction of a high fidelity program. The development of a strategic plan would allow for the goals of the program to be identified and facilitate the alignment of necessary resources to achieve these goals. This strategic plan should include the budgetary allowance for both capital costs and operating costs. It should also incorporate aspects such as staff preparation and education, the purchasing of equipment and the physical location to accommodate the high fidelity mannequin. Additionally, the role of technical support staff, the academic staff, an ongoing maintenance program, necessary ancillary equipment as well as consumables required for the effective implementation of the program should also be included in the strategic plan.
The lack of technical support when implementing the high fidelity simulation teaching was highlighted and this was a huge impediment for nurse academics. It is recommended that funding is allocated in the strategic plan for extra technical support to assist with the facilitation of high fidelity sessions. Moreover, there is an additional need for funding allocation in order to reduce class sizes when using high fidelity simulation as a teaching and learning strategy. This funding would be needed because more classes would need to be offered. However, smaller class sizes would enhance the effectiveness of learning experiences for students and improve staff satisfaction.

The role of a simulation leader in this study was identified as integral to the success of the introduction of a new program such as high fidelity simulation. The complexity and diversity of the role were highlighted. It was recognised that the workload allocation for the academic advisor was insufficient. The expectation that one person could achieve the entire implementation of this program with such limited workload allocation was unrealistic. It is recommended that a realistic workload allocation must be given to this role for it to be effective. Leaders working in tandem were suggested by Taplay et al. (2015) as an effective strategy where the simulation leader works closely with senior management. The authors believed that this style of leadership increased uptake by faculty as the approach is consultative with clear communication channels.

Another recommendation is that the designated simulation leader should have power to make decision relating to staff allocation and integration of simulation activities into the nursing practice units of study. The simulation leader in this study
lacked decision making powers and this was seen to be an impediment to implementation.

It was identified, in this study, that educational preparation of staff was inconsistent and created challenges in relation to the successful uptake of the program. Issues such as lack of attendance at workshops, and lack of a comprehensive educational workshop introducing the essential aspects both in technology and education were identified. A framework such as Jeffries model for designing, implementing and evaluating simulations (2005) could be useful as a guide for comprehensive workshops for faculty education.

An additional barrier that was suggested as an impediment to educational preparation of staff was ‘academic busyness’ and the employment of a large casual workforce. The development of a formal educational preparation plan is recommended that acknowledges the inclusion of workshop attendance in the workload allocation for permanent staff and paid attendance to workshops for casual staff. This participation at workshops would enhance educational preparation for nurse academics and thus improve the student experience and staff satisfaction. According to Roger’s (2003) for uptake of an innovation to take place faculty members must be allowed time.

8.6 Suggestions for further research

Further research is needed in a number of areas in relation to the design, implementation and evaluation of simulation in nursing. These areas include leadership, theoretical fundamentals, design, application and learning outcomes. Research using a mixed method approach to investigate the development of the
role of a simulation leader is recommended. Specifically, exploration of simulation leaders’ attributes based on level of education, simulation training, age, gender and job description in the Australian context. This could be conducted across a number of Faculties of Nursing using a large sample size.

Additionally, the effectiveness of high fidelity simulation as a teaching and learning strategy in the preparation of pre-registration nurses for the clinical environment needs further exploration. There is a paucity of research on the educational theory underpinning Jeffries’ framework (the design, implementation and evaluation of simulations) coupled with limited studies on the effectiveness of the framework. It is also necessary to explore simulation design characteristics and student learning outcomes in order to validate a substantive evidence based model for the introduction and utilisation of simulation learning in pre-registration nursing courses in Australia.

8.7 Final reflection

In this study the lived experiences of nurse academics in a School of Nursing and Midwifery in Australia have been uncovered. The richness of their experiences has provided insight into the lifeworld of this group of nurse academics. It has illuminated strengths and barriers in relation to uptake of an innovative educational program such as high fidelity simulation by nursing faculty in a large multi campus university. The findings from this study can provide the foundations and insight for other faculties of nursing interested in introducing simulation learning; inform management in the development of strategic plans relating to innovative teaching
modalities, and guide individual nursing curricula. In addition the findings can be used as the groundwork for future research studies.
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Appendix 1: Notification of Ethical Approval

Astrid Frojdj

From: Kay Buckley <K.BUCKLEY@uws.edu.au>
Sent: Tuesday, 30 March 2010 3:03 PM
To: Sharon Hillege, Astrid Frojdj
Subject: RE: HREC Approval H7771

Notification of Approval

30 March 2010

Email on behalf of the UWS Human Research Ethics Committee

Dear Dr Sharon Hillege & Astrid Frojdj (PhD candidate),

I’m writing to advise you that the Human Research Ethics Committee has agreed to approve the project.

TITLE: Introduction to simulation learning in a pre-registration nursing course: uptake by faculty, a case study

The Protocol Number for this project is H7771. Please ensure that this number is quoted in all relevant correspondence and on all information sheets, consent forms and other project documentation.

Please note the following:

1) The approval will expire on 1 April 2013. If you require an extension of approval beyond this period, please ensure that you notify the Human Ethics Office humaneth@uws.edu.au prior to this date.

2) Please ensure that you notify the Human Ethics Officer of any future change to the research methodology, recruitment procedure, set of participants or research team.

3) If anything unexpected should occur while carrying out the research, please submit an Adverse Event Form to the Human Ethics Officer. This can be found at http://www.uws.edu.au/research/researchers/ethics/human_ethics/human_ethics_adverse_eventend_of_project_report

4) Once the project has been completed, a report on its ethical aspects must be submitted to the Human Ethics Officer. This can also be found at http://www.uws.edu.au/research/researchers/ethics/human_ethics/human_ethics_adverse_eventend_of_project_report

Finally, please contact the Human Ethics Officer, Kay Buckley on (02) 4736 0883 or at k.buckley@uws.edu.au if you require any further information.

The Committee wishes you well with your research.

Yours sincerely

Associate Professor Janette Perz
Chair, UWS Human Research Ethics Committee

Kay Buckley
Human Ethics Officer
University of Western Sydney
Locked Bag 1157, Penrith NSW 1797
Tel: 02 4736 0883
http://www.uws.edu.au/research/researchers/ethics/human_ethics
Appendix 2: Amended Ethical Approval

Looked Bag 1797
Penrith NSW 2751 Australia

Office of Research Services

Our Reference: 10/002035 | H7771

10 May 2013

Doctor Sharon Hillege
School of Nursing and Midwifery

Ms Astrid Frojold
School of Nursing and Midwifery

Dear Sharon and Astrid

RE: Amendment Request to H7771

I acknowledge receipt of your email dated 2 April 2013 concerning a request to amend your approved research protocol H7771 “Introduction to simulation learning in a pre-registration nursing course: Uptake by faculty – A Case Study”.

The Office of Research Services has reviewed your amendment request and I am pleased to advise that it has been approved as follows:

1. Extension of approval period until 11 April 2014 with further extension approved at that time with the provision of a progress report

Please do not hesitate to contact me at humanethics@uws.edu.au if you require any further information.

Regards

Jillian Shute
Human Ethics Officer
Office of Research Services
Appendix 3: Participation Information and Consent Form

Amended Participant Information Sheet (General)

Project Title: Introduction to simulation learning in a pre-registration nursing course: uptake by faculty.

Who is carrying out the study?
You are invited to participate in a study conducted by Astrid Frojold. The research will form the basis for the degree of Doctor of Philosophy at the School of Nursing and Midwifery, University of Western Sydney under the supervision of Dr Sharon Hillega, Senior Lecturer.

What is the study about?
The purpose is to investigate the experiences of nurse academics when developing, implementing and evaluating simulated learning experiences in a pre-registration nursing program.

What does the study involve?
The study involves participation in two semi structured interview sessions. The first interview will be conducted within the first three (3) months of the implementation of simulation learning at the School of Nursing followed by a second interview in the third year after commencement of the program. The interviews will be audiotaped.

How much time will the study take?
Each interview will take approximately sixty (60) minutes.

Will the study benefit me?
The study will give you the opportunity to discuss and reflect upon the implementation of the new simulation program in a confidential environment and become more empowered as an active participant in the process of change.

Will the study involve any discomfort for me?
It is not expected that the study will involve any discomfort however if you do experience discomfort you will have access to the free counselling service through the University of Western Sydney.

How is this study being paid for?
The study is unfunded research.
Will anyone else know the results? How will the results be disseminated?
All aspects of the study, including results, will be confidential and only the researchers will have access to information on participants. The research will be presented as a PhD thesis, at conferences and presented for publication in refereed journals but individual participants will be not be identifiable in such reports. Participants may contact the researcher for access to the research findings.

Can I withdraw from the study?
Participation is entirely voluntary: you are not obliged to be involved and - if you do participate - you can withdraw at any time without giving any reason and without any consequences.

Can I tell other people about the study?
Yes, you can tell other people about the study by providing them with the chief investigator’s contact details. They can contact the chief investigator to discuss their participation in the research project and obtain an information sheet.

What if I require further information?
When you have read this information, Astrid Frojold will discuss it with you further and answer any questions you may have. If you would like to know more at any stage, please feel free to contact Astrid Frojold, student researcher on 02 91144024.

What if I have a complaint?
This study has been approved by the University of Western Sydney Human Research Ethics Committee. The Approval number is [enter approval number]

If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through the Office of Research Services on Tel 02 4736 0583 Fax 02 4736 0013 or email humanethics@uws.edu.au.

Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

If you agree to participate in this study, you may be asked to sign the Participant Consent Form.
Amended Participant Consent Form

Project Title: Introduction to simulation learning in a pre-registration nursing course: uptake by faculty.

1. I, ................................., hereby consent to participate in the research project titled: Introduction to simulation learning in a pre-registration nursing course: uptake by faculty.

I acknowledge that:

I have read the participant information sheet and have been given the opportunity to discuss the information and my involvement in the project with the researcher/so

The procedures required for the project and the time involved have been explained to me, and any questions I have about the project have been answered to my satisfaction.

I consent to participate in two interviews. The first interview will be conducted within the first three (3) months of the implementation of simulation learning at the School of Nursing followed by a second interview three (3) years from the commencement date. I understand that both interviews will be approximately sixty (60) minutes and will be audio taped.

I understand that my involvement is confidential and that the information gained during the study may be published but no information about me will be used in any way that reveals my identity.

I understand that I can withdraw from the study at any time, without affecting my relationship with the researcher/s now or in the future.

Signed:

------------------------------------------

Name:

Date:

Return Address:
Appendix 4: Questions for Participant Interviews

Draft Script for interviews

Aim: the interviews are aimed at eliciting the lived experiences of the participants when introducing, adopting and implementing a high fidelity simulation program. The format will be open-ended questions using the techniques of probing, reflecting and summarising points of interest.

Example questions that may be asked are:

General questions interview 1

1. Tell me about your thoughts on ‘high fidelity simulation’?

2. I am interested in how the introduction of a high fidelity simulation program has been for you?

3. What level of involvement did you have in the development of the simulation program?

4. How do you think that students have responded to the implementation of simulation learning?

5. How do you think your team functioned and collaborated in the development phase of the simulation program.

General questions interview 2

1. Tell me about your experiences over the last 3 years

2. Tell me about your teaching responsibilities within the program over the last 3 years?

3. How do you think that students have responded to the implementation of simulation learning?

4. Tell me about how your team functioned and collaborated in the development and implementation of the simulation program.
Appendix 5: Publications
The Effectiveness of Simulation-Based Blood Pressure Training in Preregistration Nursing Students

Christopher James Gordon, RN, PhD; Astrid Frotjold, RN, MNS; Judith Fethney, BA(Hons); Jennifer Green, RN, PhD; Jennifer Hardy, RN, PhD; Michelle Maw, RN, MEd; Thomas Buckley, RN, PhD

Introduction: Mastery of auscultatory blood pressure is challenging for preregistration nursing students. This phenomenon has been attributed to the psychomotor skills required, knowledge about blood pressure measurement, and the teaching modality type. Most studies focus on developing blood pressure proficiency without determining the measurement accuracy. We sought to determine the efficacy of simulation-based learning on blood pressure measurement accuracy in first-year preregistration nursing students.

Methods: First-year preregistration nursing students from a clinical subject were randomly assigned to laboratory groups, which formed the control and intervention groups. Each group received identical blood pressure measurement education, with the intervention group undertaking 2 additional hours of tuition, using human patient simulators programmed with a wide range of blood pressure measurements to replicate patient’s blood pressures observed in clinical settings. At the end of the semester and after 40 hours of hospital clinical practice, participants were assessed for blood pressure accuracy on live subjects and completed a questionnaire on self-ratings of confidence and technical ability.

Results: Blood pressure accuracy was not significantly different between participants and assessors or between the control and intervention groups (all \( P > 0.05\)). The intervention group reported greater levels of confidence (\( P = 0.02\)) and self-rated technical ability (\( P = 0.01\)) in blood pressure measurement at week 14 of the semester; however, these differences were not observed at the end of 40 hours of clinical practice (\( P < 0.05\)).

Conclusions: Accuracy in taking blood pressure was not enhanced by the use of a patient simulator, despite improvements in self-reported confidence and technical competency. Further research is required to evaluate the inclusion of simulation-based learning for blood pressure training in nursing students.

Key Words: Blood pressure, Clinical skills, Nurse education, Simulation.

Traditionally, preregistration nursing students acquire clinical skills through theory and practice before attending clinical practicum. This is performed in an attempt to develop mastery in clinical skills before exposing students to patients in clinical settings. However, beginner health professional students often have not mastered all the necessary clinical skills before embarking on clinical practice.\(^1\)\(^-\)\(^4\) Blood pressure (BP) measurement is an essential, frequently performed clinical procedure that student nurses have difficulty in mastering,\(^5\) with reported knowledge deficits and incorrect measurement techniques.\(^4\)\(^-\)\(^6\)

Typically, in preregistration nursing curricula, BP tuition is conducted in clinical laboratories. This usually involves students practicing on each other but rarely on patients, especially those with altered BP. Because students are often young, healthy individuals, BPs will usually be within normotensive limits, thus nonrepresentative of many clinical patient populations. Therefore, in many cases, students will not have had previous exposure to abnormal BP measurement practice before clinical practice. Yet, students will often encounter patients in clinical practice with abnormal (high and low) BP.\(^7\) One method that could be used to replicate patient abnormal BP is through the use of simulators, with their use dramatically increasing in nursing education during the last 2 decades, predominately, in an effort to facilitate and complement learning of a variety of clinical skills.\(^8\)

Medium-fidelity to high-fidelity simulators have been incorporated into clinical nursing education to replicate patient’s physiologic responses in a safe learning environment.\(^9\)\(^,\)\(^10\) Recently, it has been shown that third-year pharmacy student’s accuracy and confidence with learning BP measurement was enhanced using simulators.\(^11\) Therefore, nursing students exposed to simulator-based training before clinical practice may improve BP measurement accuracy.

To date, there is a paucity of evidence to validate the inclusion of simulation in the teaching and learning of BP measurement and importantly the transfer of this skill to clinical practice. In this study, we sought to assess the effectiveness of human patient simulators in preparing nursing students for the measurement of BP in clinical practice. We hypothesized that the intervention group, who received supplemental simulation-based BP training, would
have superior BP measurement accuracy and report greater confidence and technical ability compared with the standard BP training group.

**METHODS**

**Study Participants**

First-year preregistration nursing students participated in the study conducted at an Australian university. All participants were undertaking a preregistration master of nursing degree (MN graduate entry) or master of nursing and either a bachelor of arts, science, or health science (MN combined). Participants were randomly assigned to laboratory groups associated with a clinical nursing subject. Participant randomization occurred during enrolment in the subject before enrolment in the study. Students were allocated to computer-generated laboratory groups. This process was independent of the researchers, and students were not able to be relocated once allocation was set. Assessors and participants were blinded to the intervention. Researchers who delivered the intervention were not blinded but did not undertake any BP accuracy assessment. Therefore, we believe that the study had high experimental rigor.12 The laboratory groups then formed the assessment. Therefore, we believe that the study had high

**Procedures**

All participants received 4 hours of BP measurement theory and practical instruction. This was composed of lectures, tutorials, and laboratory-based sessions with participants practicing auscultatory manual BP measurements on peers and using human patient simulators (Nursing Anne Vital Sim). The simulators were preprogrammed with BP within the normotensive range. The intervention group undertook identical training to the control group with an extra 2 × 1-hour simulation-based sessions using the same human patient simulators (Nursing Anne Vital Sim). In these sessions, participants were provided with tuition about BP measurement using simulators set to a wide range of BP readings (range: systolic, 80–165 mm Hg; diastolic, 55–100 mm Hg). In addition, the simulators’ Korotkoff sound volumes were altered (both high and low) so that participants encountered different auditory levels, thereby further replicating patient’s BP in clinical environments. Accordingly, we surmised that these sessions would provide participants with a greater ability to detect abnormal BP readings in live subjects and in patients during clinical practice.

All participants were tested in the final week of a 14-week semester (T1) and the last 2 days of 40 hours of clinical practice (T2). On the first day of testing, participants attended the laboratories and were allocated to a faculty registered nurse academic who had experience in BP education and measurement. Blood pressure was measured in adult volunteers (young to older who had a range of BP readings) using the auscultatory method with a mercury sphygmomanometer and double-headed stethoscope. Participants were instructed to measure BP as accurately as possible and record to the nearest 2 mm Hg. Participants were introduced to the assessor and volunteer and then measured BP while the assessor determined the Korotkoff sounds at the same time as the participant. In this way, validation of the correct BP reading could be reported. The participants and faculty registered nurses recorded the BP reading manually on data sheets without conferring, thereby reducing bias. Blood pressure was assessed on the same arm in all volunteers.

After the completion of the BP measurements, participants transferred to a separate room and completed a questionnaire and knowledge test, specifically developed by educational experts for this study. This comprised the establishment of face validity. The questionnaire consisted of 15 items focusing on participant’s self-reported confidence (7 items) and technical ability (8 items) with BP measurement. Participants rated their confidence responses on a 5-point Likert scale (ranging from strongly disagree to strongly agree) to statements about their confidence when measuring BP. Higher scores indicate greater confidence. Similarly, using another 5-point Likert scale (range, very difficult to very easy), participants responded to statements about their technical ability when measuring BP, with higher scores indicating greater technical ease. The knowledge test consisted of 10 yes-no questions about correct BP measurement procedures. The questions were derived from the National Heart Foundation of Australia Guide to Management of Hypertension.13

In the clinical practice phase of the study (T2), participants were assessed for BP measurement accuracy and completed the confidence and technical ability questionnaire, similar to the end of semester protocol phase. Patients in clinical practice consented to BP measurement, with participants and assessors using the same double-headed stethoscopes to measure auscultatory BP. The participants and assessors recorded BP readings independently to minimize measurement bias. Thereafter, participants completed the confidence and technical ability questionnaire, which captured their experiences during 40 hours of clinical practice. Two questions were removed from the confidence subscale because these related to measuring BP on human patient simulators, thereby reducing the subscale to 5 items. Clinical practice occurred in the week immediately after the end of semester study phase.

**Data Analysis**

Data are presented as means with SDs and frequencies, unless otherwise stated. Participant characteristics between the groups were analyzed using independent groups t test for interval data and χ² for categorical data. Outcome measures were compared at the end of semester, which was considered baseline (T1), between the 2 groups, and again during clinical practice (T2). Comparisons between absolute BP data were analyzed using independent groups t tests. To explore the accuracy of BP readings between the control and intervention groups, we calculated the differences in systolic and diastolic BP between the assessor and participants at each time point.
This was considered the BP difference score. This was also analyzed using independent groups $t$ test. The relationship between BP accuracy (difference between assessor and participant) and the number of times BP was practiced was analyzed using Spearman rank-order correlation. Reliability and validity testing was conducted to substantiate the 2 questionnaire’s subscales (confidence, technical ability). Internal consistency reliability was assessed using Cronbach $\alpha$, with $\alpha$ coefficients $>0.7$ considered acceptable.$^{14}$ Multitrait multiscale analysis was used to assess the convergent and divergent validity of the confidence and technical ability subscales. A higher correlation of each item with its subscale (corrected for overlap) than with the other subscale was considered a successful demonstration of convergent validity, whereas a lower correlation with the other subscale was considered a demonstration of divergent validity. Including statistical significance, we calculated effect sizes (Cohen’s $d$) to determine practical clinical significance to the intervention. Following Cohen’s effect size conventions, 0.2 is small (difference can only be detected statistically), 0.5 is medium (difference can be detected by a trained observer), and 0.8 is large (difference can be detected by an untrained observer).$^{15}$ To have a standard against which to assess the effect sizes in this study, the 0.5 criterion was used.$^{14}$ Across a range of different psychosocial measures, these authors determined that discrimination occurred at approximately half a SD, or medium effect size. The BP knowledge test was transformed to 100% and then analyzed using Mann-Whitney $U$ test for differences. Statistical significance was set at $\alpha < 0.05$ (2 tailed) for all analyses.

RESULTS

Participant demographics were not significantly different between the control and intervention groups at baseline (Table 1). It was not possible to follow all participants during the clinical practice phase (T2), resulting in reduced numbers of participants compared with T1 evaluation phase ($n = 103$). The primary reasons for the dropout were the number of assessors available, equipment limitations, and students discontinuing from the degrees. There were no statistically significant differences between the control ($n = 49$) and intervention ($n = 54$) groups for age, sex, course, education, previous BP education, and the amount of BP practice during clinical practice ($all P > 0.05$).

Questionnaire Reliability and Validity

Cronbach $\alpha$ of the self-reported confidence and technical ability subscales were 0.81 and 0.83, respectively. This demonstrates strong internal consistency with the survey. Convergent and divergent validity of the confidence and technical ability subscales are reported in Table 2. In general, items within a subscale were more strongly correlated with that subscale rather than with items from the other subscale. Stewart and Ware$^{16} (1992)$ advise that correlation coefficients of 0.3 to 0.4 are acceptable.

Blood Pressure Readings

The BP difference score (differences in systolic and diastolic BP between the assessor and participants at each time point) were not statistically significant different between the control and intervention groups at T1 (systolic, $P = 0.85$; diastolic, $P = 0.92$) and T2 (systolic, $P = 0.28$; diastolic, $P = 0.82$). Interestingly, the SDs were large, greater than the means, indicating a high variability in measures (Table 3). There were no differences in the number of times participants practiced measuring BP in the control and intervention groups at T1 and T2. On average, at T1, most participants practiced BP between 6 and 10 times and 0 and 5 times at T2. Moreover, BP measurement accuracies (mm Hg, difference between assessor and participant readings) were not associated with the number of times participants practiced measuring BP during the semester (control: systolic $r = 0.03$, $P = 0.79$; diastolic $r = 0.16$, $P = 0.17$; intervention: systolic $r = -0.005$, $P = 0.97$; diastolic $r = -0.04$, $P = 0.75$) or clinical practice (control: systolic $r = -0.18$, $P = 0.22$; diastolic $r = -0.11$, $P = 0.47$; intervention: systolic $r = 0.21$, $P = 0.13$; diastolic $r = -0.14$, $P = 0.29$).

Confidence and Technical Ability Questionnaire and Knowledge Tests

In contrast to the BP measurements, the intervention group rated their confidence ($P = 0.015$) and technical ability ($P = 0.009$) significantly higher than the control group at T1 (Table 4). There was a modest effect size for the confidence subscale (Cohen’s $d = 0.374$) and technical ability subscale ($d = 0.405$) at T1. However, at the end of clinical practice (T2), these effects were nullified with no statistical difference in confidence or technical ability between the groups (all $P > 0.05$) and significantly reduced effect sizes (confidence, $d = 0.005$; technical ability, $d = 0.06$).

The intervention group scored significantly higher than the control group on the knowledge test (mean [SD], 88.2 (11.7) vs. 84.7 [11.3]; $P = 0.02$) at week 14 of the semester.

DISCUSSION

The primary findings from this study suggest strongly that supplementary simulation-based BP measurement does not improve learner’s accuracy when measuring BP in subjects in the laboratory or patients in clinical settings. In contrast, participants’ self-rated confidence and technical ability as well as BP measurement knowledge was superior at
the end of the semester in the intervention group, but differences between the groups were nullified by the conclusion of clinical practice. This implies that specific simulation-based tuition of BP measurement assists with students’ perception of skill aptitude and knowledge but did not improve competence of the skill, as assessed using BP measurement accuracy. Interestingly, these improvements seem to be transient, as the control group demonstrated similar confidence and technical ability ratings at the end of 40 hours of clinical practice. This may suggest that exposure to real-life clinical settings influences students’ perceptions irrespective of previous learning methodologies.

To the best of our knowledge, no other researchers have used human patient simulators to mimic abnormal BP readings observed in patients as a teaching modality, before students entering clinical settings. We did not detect differences in BP accuracy between the experimental groups at either time point. This was an unexpected finding as previous research has shown accuracy improvements in subjects who have had previous simulation-based BP training, although methodological variations from the present study may explain these differences. In all studies, BP measurement was not determined on live subjects but evaluated using simulators. This accuracy improvement may not be transferable to live subjects and patients, as observed in the present study. Ballard et al reported a lack of BP measurement knowledge and skills among first-year nursing students. Seybert et al (2007) determined BP accuracy in doctor of pharmacy students and found that BP accuracy improved sequentially as students practiced BP measurement on the simulator. There was no control group in this study. When assessing students’ BP measurement accuracy in live subjects, Lee et al (2010) reported no difference in accuracy when measuring BP in live subjects and a simulator arm. They conclude that using simulation as a teaching tool for BP measurement is equally efficacious as using human subjects. In all studies, abnormal BP measurements were not recorded, and therefore, participants had limited BP measurement variability. The present study was better equipped to determine BP readings that would be experienced in patients in clinical settings; however, we found that supplementary simulation-based tuition does not improve BP accuracy in first-year nursing students.

This posits the question, was the simulation-based BP intervention effective? The results infer that the simulation intervention was unsuccessful at improving BP measurement accuracy when compared with traditional teaching methods. Yet, this study used supplemental simulation-specific BP tuition that attempted to mimic what students may encounter in clinical practice, rather than a reduction in teaching time. It seems reasonable to conclude that the simulation training time could substitute for portions of the traditional tuition and equally prepare students for clinical practice. A future study may address these issues by comparing reduced teaching time with simulation interventions to ascertain clinical effectiveness.

The accuracy of BP measurement in both settings (faculty laboratories and clinical practice) in the control and intervention groups needs to be addressed. It seems that the volume of BP training (4 hours) combined with the amount of practice in the laboratory-based sessions may have been sufficient for participants to acquire significant accuracy, and the additional 2 hours of simulation-specific BP training did not substantially contribute to BP measurement precision. Others have reported varying results with similar volumes of BP training. Brokalski et al reported a lack of BP measurement knowledge in undergraduate nursing students after 3 hours of tuition combined with laboratory practice. These results were significantly improved after a supplemental training period. However, BP accuracy was not assessed per se. However, auscultatory BP measurement was similar to an automated
BP machine in second-year pharmacy students after 4 hours of BP tuition. The fact that the intervention group was not superior to the control implies that a ceiling effect may have been reached at the end of the semester. This is a recognized phenomenon that has been described in the attainment of technical clinical skills. Therefore, we surmise that the core teaching intervention was likely to be effective and may be reduced and replaced with simulation-related BP tuition.

The larger variability of BP readings measured during clinical practice was substantially greater than the patients at the end of the semester. This is likely to reflect the greater BP variation of patients in clinical settings, especially in patients with abnormal BP readings. It is not unreasonable to propose that the intervention group may have been better equipped to accurately determine the BP variability, owing to the increased practice time and exposure to variable BP readings using the human patient simulator. However, BP measurement accuracy was not different between the groups, suggesting that the supplementary BP training did not infer any clinical performance advantage. Therefore, it seems reasonable to conclude that the volume of clinical practice time, as it relates to BP measurement training, could also be reduced. The results strongly suggest that BP measurement accuracy, which was transferable to clinical settings, was attained before clinical practice placement. This would be appealing to educators because substituting clinical practice time with specific simulation-based learning has been shown to be efficacious without conceding clinical aptitude. In addition, the added benefit of students practicing clinical skills with simulation equipment reduces the need for patient exposure and increases patient safety.

Although we did not test participant’s anxiety levels, it was observed that several participants were anxious during the testing phases. The possibility exists that heightened anxiety was greater in the intervention group, despite elevated self-rated confidence and technical ability scores. It is well established that many nursing students experience anxiety and stress related to clinical performance and practice. However, it has been argued that previous simulation exposure may alleviate these conditions. Our findings are contrary to these reports, and further research is required to elucidate the relationship between simulation and anxiety in clinical settings.

The increase in self-reported confidence and technical ability related to BP measurement at the end of the semester in the intervention group may have been clinically significant as evidenced by the effect size. Numerous studies have reported substantial increases in self-rated confidence, technical and nontechnical ability after simulation-based training. However, increased self-confidence does not equate to improved clinical performance or indeed clinical skill competence but has been advocated to assist in reflection on performance. In the present study, we have no evidence indicating that participants were better able to reflect on their performance. The nexus between increased confidence and performance is a difficult issue for health professional educators, especially in simulation. Many studies report an increase in confidence after simulation; however, does this translate to an increase in performance and in particular in the clinical domain? This study surmises that it was not an important factor. Interestingly, the control participants demonstrated improvements in confidence and technical ability over the course of the clinical practice, resulting in similar scores to the intervention group. Therefore, this suggests that participants undertaking simulation-based learning of BP training before clinical practice improve their self-reported confidence and technical ability in a similar manner to participants exposed to 40 hours of clinical practice exposure, regardless of the clinical setting. This may influence further curriculum development, with an emphasis on simulation-based learning of BP before clinical practice in an effort to improve confidence and technical ability. In this way, educators may be able to focus on BP accuracy in clinical practice rather than confidence.

The increase in knowledge scores in the supplementary simulation-based BP group was a novel finding. Previous studies have observed a knowledge deficit in preregistration nursing students, medical students, and practicing nurses and doctors. Blood pressure measurement is a psychometrically complex task, and although clinicians may demonstrate mastery, knowledge gaps exist. To the best of our knowledge, this is the first study to reveal improvements in BP measurement knowledge after a simulation-specific BP program. Accordingly, simulation training may confer a greater understanding of BP measurement, and this may be a teaching method that consolidates learning.

Limitations

We were only able to include currently enrolled students who chose to participate, and therefore, the study was not powered a priori for statistical significance. This limitation was somewhat offset by the large number of participants enrolled in the study. Those administering the intervention program were not blinded but did not participate in the testing phases. Therefore, the study was double-blinded. In addition, there was a high dropout of participants between week 14 of semester (T1) and clinical practice (T2). We were constrained by logistics of personnel and equipment and could not follow all participants from the university to the hospitals where students were undertaking clinical practice.

The difference in BP readings between the assessors and participants may not be entirely accurate, as cuff deflation speed, placement of the stethoscope diaphragm, and alignment of the sphygmomanometer at heart level were not consistent among participants. Consequently, the assessor may have been reliant on the participants’ method in ascertaining a precise BP reading, and this may have impacted the accuracy of assessor readings. For instance, if the cuff deflation speed was rapid, the assessor may not have heard the first Korotkoff sound. Although this was a possibility, all assessors have had previous experience in the use of dual-headed stethoscopes, and it was anticipated that their BP measurement proficiency was high.

CONCLUSIONS

In preregistration health professional education, there is a paucity of evidence about how simulation should be incorporated into the curriculum and how this translates to subsequent clinical performance. To date, no studies have explored methods of enhancing BP measurement accuracy in
nursing students before clinical placements. Simulation-based learning provides participants with realistic features of clinical practice, and therefore, it seems logical that this may enhance BP measurement mastery in novice learners. Therefore, this simulation-based BP training study was conducted in first-year preregistration nursing students to ascertain if BP accuracy is enhanced. We found that this did not confer improvements in BP accuracy, either before or during clinical practice. However, increased self-ratings of confidence and technical ability and greater knowledge were observed, suggesting that supplementary simulation-based BP training enhances self-efficacy without improving BP measurement accuracy.

REFERENCES
Nursing students blood pressure measurement accuracy during clinical practice

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ABSTRACT

Background: Blood pressure measurement is a complex skill to master and we sought to determine whether nursing students could measure blood pressure accurately on patients during their first clinical placement. We also examined whether clinical facilitator’s subjective rating of nursing student’s competence and confidence was related to blood pressure measurement.

Methods: First year nursing students (n = 105) blood pressure measurement was determined at the end of 40 hours of clinical placement. Clinical facilitators (n = 17) assessed blood pressure accuracy of the students using a double-headed stethoscope on clinical patients and rated the student’s confidence and competence levels in blood pressure measurement across the clinical practicum.

Results: Bland Altman plots revealed that there was no systematic bias and that that majority of student’s blood pressure readings were within ±4 mmHg of the clinical facilitators. Blood pressure measurement was not significantly different between students and clinical facilitators (systolic: \( p = .29 \); diastolic: \( p = .96 \)). Statistically significant correlations between clinical facilitator’s ratings of student confidence, competence and blood pressure accuracy were found.

Conclusions: These findings show that blood pressure accuracy in nursing students during their first clinical placement is high. Clinical facilitators can also correctly assess student’s blood pressure accuracy using subjective ratings of competence and confidence, which may be sufficient to determine clinical proficiency.

Key Words: Blood pressure, Clinical skills, Nurse education, Students, Competence, Confidence

1. INTRODUCTION

Clinical skills are the foundation of nursing practice and, within pre-registration nursing programs; the implementation of strategies to ensure that students are clinically competent at registration is a priority for educational providers, but often problematic to achieve.\(^1\) Blood pressure (BP) measurement is a fundamental clinical skill that is frequently performed by registered nurses and one considered technically challenging to master for nursing students.\(^2\) Accuracy is imperative for patient health assessment and for informing clinical decision–making\(^3\) and it is, therefore, essential that nursing students are taught to perform the skill correctly.\(^4\) Therefore, the focus of this study was to determine whether nursing students performed BP measurement accurately during their first clinical practice placement. It further explored whether associations existed between clinical facilitator’s ratings of student competence and confidence and BP measurement accuracy in nursing students. In doing so, this study highlights the important role of the clinical facilitator in assessing BP measurement and situations in which clinical assessment can be most valuable.

Manual BP measurement using the auscultatory method is
a complex psychomotor skill which necessitates considerable practise by nursing students to achieve competence.\textsuperscript{[2]} Due to its importance in health assessment and treatment planning across a range of healthcare settings, BP measurement is typically taught early within pre-registration nursing curricula.\textsuperscript{[5]} Educational methods used to teach BP measurement comprise a variety of pedagogical approaches. These include: demonstration and re-demonstration in the clinical laboratory,\textsuperscript{[6]} simulation-based learning using high, medium and low-fidelity manikins,\textsuperscript{[7]} and e-learning and multimedia resources, which may complement practical-based skill training.\textsuperscript{[8]} While students may vary in their demonstrated level of clinical skills competence prior to clinical placement, the opportunity to practise clinical skills during these placement experiences is a valuable, and necessary learning strategy.\textsuperscript{[9]}

Research examining BP measurement skills acquisition, has focused predominantly on knowledge,\textsuperscript{[5, 10, 11]} measurement technique,\textsuperscript{[10, 12, 13]} student experience\textsuperscript{[9]} and teaching and learning strategies.\textsuperscript{[2, 7, 14]} It could be argued, however, that BP measurement accuracy is critical, especially as it relates to patient assessment, safety and decision-making. There is a paucity of research examining nursing student’s BP measurement accuracy. While many researchers have investigated causative reasons for inaccuracy, surprisingly, most have not determined the veracity of the BP reading. Accordingly, this study examined the BP measurement accuracy in first year nursing student in their first clinical practice experience.

Importantly, a factor which must be considered in terms of influencing clinical skill development is the student’s level of self-confidence which can be described as an individual’s recognition of his or her abilities and belief on one’s abilities to accomplish a goal.\textsuperscript{[15]} It is recognised that self-confidence is essential requirement for nursing practice and that students with self-confidence are more likely to achieve their clinical goals.\textsuperscript{[15]} Linked closely with the concept of confidence is competence. Defined as “the application of knowledge and interpersonal, decision-making and psychomotor skills in performance of a task or implementation of a role”,\textsuperscript{[1]} it can be suggested that BP measurement accuracy requires both competence and confidence. Therefore, these two concepts are important in clinical skills and teasing out the implications on the measurement of BP, which is a fundamental clinical skill in early pre-registration training may assist in determining student mastery and ultimately accuracy of BP measurement.

Effective supervision and student support in the clinical environment has been widely recognised in the literature as an integral requirement for effective learning.\textsuperscript{[16]} In Australia, clinical facilitators, who are registered nurses employed by universities to support students in clinical practice, are instrumental in supporting and assessing the performance of nursing students while on placement.\textsuperscript{[17]} Internationally, this group is similar to clinical instructors, clinical assessors, clinical educators, preceptors and mentors.\textsuperscript{[18]} Although differences exist regarding the exact remit of and context in which these roles are performed, they share the common goal of facilitating student learning and skill development in the practice settings. This is done through the provision of support, supervision and the identification of clinical opportunities that promote the theory-practice link. Due to the known difficulties nursing students have acquiring the skill of BP measurement\textsuperscript{[9]} clinical facilitators will typically focus on supervising students as they perform it, as well as verifying the reading. This support is of particular importance for first year nursing students who need to achieve competence and confidence when performing fundamental clinical skills, such as BP measurement. Furthermore, this will assist in providing foundations, for example in the form of manual dexterity and psychomotor fluency, required for more complex skill development.\textsuperscript{[19]}

Purpose of the study
An important but unexplored area of BP measurement skill acquisition by nursing students is methods by which clinical facilitators can determine BP measurement accuracy. Nursing student’s self-reported competence in clinical skills has been shown to be related to clinical practice supervision.\textsuperscript{[20]} It has been previously identified that student’s self-reported confidence and competence in BP measurement may impact on their ability to accurately measure BP in clinical laboratory situations.\textsuperscript{[21]} As an a priori, this suggests that clinical facilitators may be able to determine BP measurement accuracy from determination of student’s competence and confidence. Therefore, identifying the most effective ways in which this can be achieved may minimise time spent supervising students who demonstrate BP measurement competence, thereby increasing time available to support to nursing students who have not achieved this. The primary aim of this quantitative study was, therefore, to determine BP measurement accuracy of pre-registration nursing students. A further objective was to detect any associations between clinical facilitator’s ratings of student competence and confidence levels and accuracy of BP measurements.

2. Methods
2.1 Setting and participants
The study was conducted in a nursing faculty at a large Australian university. Participants (n = 105) comprised first year pre-registration students. Participants were assessed by clinical facilitators (n = 17) during their clinical practice (40
hours) (see Table 1 for demographic details). Thirty-five nursing student participants disclosed that they had been trained previously in BP measurement technique. Of these, 20 reported they had previous experience in BP measurement, although this experience was limited and had not taken place in the hospital setting and therefore, was unlikely to impact on this study findings.

2.2 Ethical considerations
Participation was voluntary and approval for the study was granted by the University’s Human Research Ethics Committee (Protocol No. 13490). Students were informed that participation or a decision to withdraw from the study would not affect academic progress. Facilitators were also reassured that withdrawing from the study would not affect future employment within the University. Codes were used on questionnaires to ensure anonymity and maintain confidentiality.

2.3 Study design
To achieve the study aim and objectives, an exploratory quantitative research design was employed.

2.4 Procedures
Participants underwent at least four hours of on-campus BP-specific instruction during the 13-week semester after which they were exposed to a range of BP measurement opportunities during a 40-hour clinical placement in a hospital setting. Participants were taught theory in lectures and tutorials and practised BP measurements using the auscultatory technique on student peers and human patient simulators (Nursing-Anne Vital Sim™) in clinical laboratory classes. They were also provided with opportunities to independently practise BP measurement in clinical laboratories outside class hours.

Table 1. Participant demographics

<table>
<thead>
<tr>
<th></th>
<th>Nursing students (n = 105)</th>
<th>Clinical facilitators (n = 17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years) - mean (SD)</td>
<td>26.6 (7.6)</td>
<td>50.5 (10.2)</td>
</tr>
<tr>
<td>Female</td>
<td>77 (88.5%)</td>
<td>15 (88.2%)</td>
</tr>
<tr>
<td>Education - highest attained</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher School Certificate</td>
<td>25 (24.5%)</td>
<td>–</td>
</tr>
<tr>
<td>Bachelor degree</td>
<td>62 (60.8%)</td>
<td>7 (41.2%)</td>
</tr>
<tr>
<td>Master degree</td>
<td>10 (9.8%)</td>
<td>4 (23.5%)</td>
</tr>
<tr>
<td>Other</td>
<td>5 (4.9%)</td>
<td>6 (35.3%)</td>
</tr>
<tr>
<td>Registered nurse duration (years, SD)</td>
<td>–</td>
<td>24.4 (11.3)</td>
</tr>
<tr>
<td>Clinical facilitators experience (years, SD)</td>
<td>–</td>
<td>9.5 (8.8)</td>
</tr>
</tbody>
</table>

Note. Key: Other refers to nursing certificate, post-registration certificate, Graduate Certificate or Graduate Diploma degree

During the 40-hour clinical placement, participants were supervised by a clinical facilitator, who also conducted a single formal assessment of each participant’s BP measurement accuracy at the end of the clinical placement. These BP assessments occurred within the final two days of the clinical placement and timing was determined by the student in consultation with the clinical facilitator. Participants selected a patient with unknown BP and, after obtaining verbal consent, BP was measured simultaneously with the clinical facilitator, using a double-headed stethoscope. During the procedure facilitators refrained from providing verbal or physical prompts.

2.5 Data collection
Participants and clinical facilitators independently documented their BP readings. Immediately following this assessment of BP, student participants completed a questionnaire related to their level of confidence and competence during the clinical practicum. The 13-item participant questionnaire had been developed for another study[21] and contained eight items pertaining to the participant’s self-rated level of clinical competence measuring BP manually using the auscultatory method. A further five items related to self-rated levels of confidence. Using five-point Likert scales, participants were asked to select one response to each item to indicate their level of agreement (1 = very difficult to 5 = very easy, and 1 = strongly disagree to 5 = strongly agree). The clinical facilitators at the same time completed a two-part question rating the student’s confidence and competence in BP measurement. The first part rated the student’s confidence in BP measurement and used a five-point Likert scale (1 = not at all confident to 5 = extremely confident), and the second part of the question rated the student’s competence (1 = poor to 5 = excellent) when performing BP measurement during the entire 40-hour clinical placement. Additionally, student participants recorded the number of times they practiced BP
measurement during the 40 hours of clinical placement (categories 0-5, 6-10, 11-20, 20+) which was used to determine if this was associated with BP measurement accuracy.

2.6 Data analysis
Data are presented as means with standard deviations and frequencies, unless otherwise stated. To evaluate the level of agreement between the clinical facilitator’s and student’s BP readings we used the Bland-Altman method.[22, 23] Bland-Altman plots provide insights into systematic bias and use a graphical representation of the two measurements (clinical facilitators and students BP readings) which allows for a visual judgement of the two measurements level of agreement, especially outliers.[24] The Bland Altman plots have an x axis which represents the average of the two measurements (facilitators and students BP readings) and y axis which is the difference between the two measurements. For interpretation, a horizontal line represents the level of bias and two exterior horizontal lines express the 95% limits of agreement in which 95% of the difference between the measurements are positioned, and calculated as ±1.96 times standard deviations. The BP accuracy was calculated as the difference in systolic and diastolic BP between the clinical facilitator and participants blood pressure (mmHg) measurements when assessment was conducted at the end of the clinical placement. Blood pressure accuracy scores that were negative (i.e. clinical facilitator BP readings were less than the nursing students) were transformed to positive values for correlational analyses. A Mann-Whitney U test was used to compare student participants and clinical facilitator’s confidence scores related to the BP measurement. In addition, facilitators’ ratings of participants’ confidence and competence were compared using a Mann-Whitney U test of two stratified groups: 0-3 mmHg vs. 4 mmHg and above, for systolic and diastolic BP values. Systolic and diastolic BP readings that were within or equal to 4 mmHg of the actual BP measurement were considered to be clinically relevant[25] and this was selected as the cut-off point. To determine if correlations existed between participants and clinical facilitator’s confidence and competence ratings vs. BP, Spearman’s rank-order correlation was used. Spearman’s rank-order correlation was used to assess any association between BP accuracy (difference between clinical facilitator and student) and the number of times BP was practiced during the 40 hours of clinical placement. Cronbach’s alpha was employed on the student participant 8-item confidence sub-scale and 5-item competence sub-scale to determine internal consistency reliability with alpha coefficients >0.7 considered acceptable.[26] Statistical significance was set at alpha < 0.05 (two tailed) for all analyses. Data analysis were performed using the Statistical Package for the Social Sciences (SPSS) for Windows version 21 (SPSS Inc, Chicago, IL, USA).

3. RESULTS
3.1 Blood pressure
Bland Altman graphs revealed that the average BP measurement difference between students and clinical facilitators were 0.73 mmHg and 0.02 mmHg for the systolic and diastolic BP readings, respectively (see Figure 1a and 1b). The 95% limits of agreement were ±13.9 and 8.5 mmHg for the systolic and diastolic BP readings. A total of 32 and 17 students had BP differences of greater than 4 mmHg from the clinical facilitators for the systolic and diastolic readings, respectively. Of these, there were 9 students which had greater than 4 mmHg difference with the clinical facilitator in both systolic and diastolic BP readings. As such, the majority of student’s BP measurements were considered clinically acceptable.

As revealed visually in the Bland Altman plots there was good agreement between the nursing students and clinical facilitators BP measurements. The average BP measurement were not significantly different between nursing students (systolic: 122.0 [SD±18.5]; diastolic: 67.2 mmHg [SD±13.2]) and the clinical facilitators (systolic: 122.7 [SD±19.0]; diastolic: 67.0 mmHg [SD±12.6]; systolic: p = .29; diastolic: p = .96).

We also compared the number of times BP measurement was practiced over the 40-hours of clinical practicum and compared clinical facilitator and student BP (BP accuracy; see Table 2). Moreover, the number of times BP measurement was practiced (grouped into bands: 0-5, 6-10, 11-20, 20+ times) was not correlated with the student’s systolic or diastolic BP (all p > .05).

3.2 Questionnaires
Strong internal consistency was confirmed in the nursing student’s questionnaire with Cronbach alpha in the acceptable range (confidence sub-scale: 0.82 and competence sub-scale: 0.91 respectively).

Participant’s self-reported ratings of confidence and competence levels performing BP measurement were determined by correlating the aggregated confidence score (out of a possible total score of 25) against eight items of self-reported competence. Statistically significant correlations were found for each item suggesting that participants with greater confidence may have exhibited higher levels of self-reported competence in the BP measurement (all p < .01; see Table 3). In contrast, no significant associations were found between systolic BP accuracy scores (difference between the clinical facilitators and nursing student’s BP readings) and partici-
participant’s self-reported aggregated confidence and competence (confidence: $r_s = -0.08, p = .45$; competence: $r_s = -0.03, p = .74$) and diastolic difference scores and self-reported competence ($r_s = -0.11, p = .30$). A significant association, however, was detected between diastolic accuracy and confidence ($r_s = -0.21, p = .03$) but the level of association was weak.

Figure 1. Bland-Altman plots of the clinical facilitator and student systolic and diastolic blood pressure measurements. The x-axis represents that average of the two measurements and the y-axis represents the difference between the clinical facilitators and students blood pressure measurements. The solid horizontal line represents the average difference between the two measurements (systolic: 0.73, diastolic 0.02 mmHg), and the two dashed lines represent the 95% level of agreement (systolic: -13.21 to 14.68, diastolic -8.47 to 8.51 mmHg).

There were statistically significant correlations between clinical facilitator’s ratings of the confidence and competence of participants during the BP measurement assessment and BP accuracy, except between confidence and diastolic BP accuracy (see Table 4). The negative association showed that when student’s confidence was low, BP accuracy, determined using the difference between the BP reading of the clinical facilitator and the students reading, was poor and the reciprocal as well, high student confidence was related to small differences in BP readings with the clinical facilitators.
whether associations existed between clinical facilitators rat-

Table 2. Frequency of nursing students’ blood pressure practice times and systolic and diastolic blood pressure accuracy

<table>
<thead>
<tr>
<th>No. of times BP practiced</th>
<th>Frequency (%)</th>
<th>Student systolic mean (SD)</th>
<th>Student diastolic mean (SD)</th>
<th>p value systolic</th>
<th>Facilitator systolic mean (SD)</th>
<th>Facilitator diastolic mean (SD)</th>
<th>p value diastolic</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>41 (39.8)</td>
<td>119.7 (19.5)</td>
<td>64.0 (10.7)</td>
<td>0.80</td>
<td>120.8 (20.9)</td>
<td>64.3 (10.4)</td>
<td>0.90</td>
</tr>
<tr>
<td>6-10</td>
<td>30 (29.1)</td>
<td>125.6 (13.5)</td>
<td>69.6 (10.2)</td>
<td>0.96</td>
<td>125.8 (12.2)</td>
<td>69.3 (10.2)</td>
<td>0.93</td>
</tr>
<tr>
<td>11-20</td>
<td>18 (17.5)</td>
<td>118.5 (20.2)</td>
<td>64.6 (13.1)</td>
<td>0.93</td>
<td>119.1 (19.6)</td>
<td>64.9 (12.8)</td>
<td>0.95</td>
</tr>
<tr>
<td>20+</td>
<td>14 (13.6)</td>
<td>120.6 (19.4)</td>
<td>74.9 (19.5)</td>
<td>0.92</td>
<td>121.4 (20.0)</td>
<td>73.4 (20.3)</td>
<td>0.84</td>
</tr>
</tbody>
</table>

Table 3. Correlation matrix of nursing student’s self-rating of confidence against competence items

<table>
<thead>
<tr>
<th></th>
<th>Able to locate radial artery</th>
<th>Able to palpate the brachial artery</th>
<th>Able to hear Korotoff sounds</th>
<th>Able to identify the systolic measure</th>
<th>Able to identify the diastolic measure</th>
<th>Able to control the deflation of the cuff</th>
<th>Able to accurately obtain the BP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confidence</td>
<td>( r_s = 0.217 ) ( p = .004 )</td>
<td>( r_s = .204 ) ( p = .007 )</td>
<td>( r_s = .232 ) ( p = .002 )</td>
<td>( r_s = .481 ) ( p &lt; .001 )</td>
<td>( r_s = .589 ) ( p &lt; .001 )</td>
<td>( r_s = .474 ) ( p &lt; .001 )</td>
<td>( r_s = .421 ) ( p &lt; .001 )</td>
</tr>
<tr>
<td>Competence</td>
<td>( r_s = 0.327 ) ( p = .001 )</td>
<td>( r_s = 0.254 ) ( p = .019 )</td>
<td>( r_s = 0.327 ) ( p = .001 )</td>
<td>( r_s = 0.290 ) ( p = .001 )</td>
<td>( r_s = 0.245 ) ( p = .003 )</td>
<td>( r_s = 0.215 ) ( p = .006 )</td>
<td>( r_s = 0.235 ) ( p = .004 )</td>
</tr>
</tbody>
</table>

Note. * \( p < .05 \), ** \( p < .01 \), SBP = systolic blood pressure; DBP = diastolic blood pressure.

Blood pressure accuracy scores were stratified into the most, and least accurate (best scores: 0-3 mmHg vs. least accurate scores: 4 or more mmHg) to compare how the facilitators rated participant’s confidence and competence. Several significant differences were observed between the BP accuracy groups with facilitators overall rating higher confidence and competence scores in participants with the most accurate BP scores (see Table 5).

Table 4. Spearman’s rank-order correlation between clinical facilitator’s rating of student confidence and competence in measuring blood pressure against systolic and diastolic blood pressure accuracy scores

<table>
<thead>
<tr>
<th></th>
<th>SBP accuracy</th>
<th>DBP accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confidence</td>
<td>-0.324**</td>
<td>-0.169</td>
</tr>
<tr>
<td>Competence</td>
<td>-0.327**</td>
<td>-0.225*</td>
</tr>
</tbody>
</table>

Note. * \( p < .05 \), ** \( p < .01 \), SBP = systolic blood pressure; DBP = diastolic blood pressure.

Table 5. Clinical facilitator ratings of student’s confidence and competence when comparing the most accurate (0-3 mmHg) and least accurate (4 or more mmHg) blood pressure accuracy score groups

<table>
<thead>
<tr>
<th>Blood pressure</th>
<th>Facilitator’s rating</th>
<th>( U )</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systolic BP</td>
<td>Confidence</td>
<td>881.5</td>
<td>.022</td>
</tr>
<tr>
<td></td>
<td>Competence</td>
<td>922.0</td>
<td>.052</td>
</tr>
<tr>
<td>Diastolic BP</td>
<td>Confidence</td>
<td>588.0</td>
<td>.087</td>
</tr>
<tr>
<td></td>
<td>Competence</td>
<td>514.5</td>
<td>.018</td>
</tr>
</tbody>
</table>

4. **DISCUSSION**

This study sought to identify pre-registration nursing student’s BP measurement accuracy during clinical practice and whether associations existed between clinical facilitators rating of student’s BP measurement competence and confidence and the BP measurement accuracy of the students. Blood pressure measurement in first-year pre-registration nursing students was chosen as it is a complex psychomotor skill in which it is necessary to attain competency early in pre-registration nursing programs.[12] There are, however, a broad range of other clinical psychomotor skills in which nursing students must also acquire and, like BP measurement, many of these are practised in clinical settings with the support of clinical facilitators. To date, there is a dearth of national, or international-level, standardised methods to determine nursing student’s clinical skill competence and accuracy, especially in clinical settings, and debate is ongoing about how best to teach and assess these clinical skills.[11,7] Accordingly, this study analysed issues which could potentially be used as indicators of BP measurement accuracy, as an exemplar of clinical skills more broadly.

An important finding of this study was that the majority of nursing students were able to measure BP accurately, when compared to clinical facilitator BP measurement scores. Bland Altman plots were constructed and revealed that there did not appear to be systematic bias in the measurement differences and that student precision with BP measurement at the end of their first clinical practicum was generally good. Bland and Ousey (2012) contend that achieving competence on manual BP measurement skills requires considerable practise, although they do not expand on what this comprises in terms of duration or intensity. In the current study there were no significant associations between the number of times nursing students’ practised BP measurement and measurement accuracy. This suggests that 4 hours of clinical instruction supported by 40 hours of clinical placement, during which there are opportunities to practise BP measurement, is suf-
sufficient to achieve accuracy. Therefore, it may be useful for nursing and other healthcare educators when planning clinical skills teaching timetables and curricula to consider that there may be a capacity point whereby skill acquisition will not improve until students engage in clinical practice.

A novel finding from the study was that clinical facilitators may be able to reasonably estimate BP accuracy based on their assessment of their assessment of participant’s level of competence and confidence when performing the skill. The associations with systolic BP were modest and were weak with diastolic BP. This exploratory finding requires further study.

Although it is not recommended that this method of determining BP measurement accuracy is used as a substitute for traditional methods of assessment for every student, it may minimise time spent by the facilitator closely monitoring capable students performing this skill or repeatedly verifying the measurements they obtain. Adopting this assessment method may also ameliorate the need for patients to be subjected to repeated BP measurement by nursing students and facilitators, thereby minimising unnecessary discomfort and potential anxiety. It may also provide scope for clinical facilitators to maximise the efficiency in which their time is spent supporting skills development. For example, more time could be spent with students not competent in the particular skill or through the promotion of other learning activities aimed at developing clinical proficiency and skill development in other areas.

Interestingly, study findings revealed that nursing students did not report confidence and competence levels that were commensurate with their BP measurement accuracy. The lack of correlations between nursing student self-reported confidence/competence and BP accuracy suggests that students were not able to accurately determine their BP proficiency. These findings confer with those reported by Bâillie and Curzio (2009) from their survey of first year nursing students’ experiences of learning BP measurement. These authors found that although overall perceived levels of self-confidence and accuracy increased with experience, some students’ levels of confidence remained low despite increased practise.

In contrast, nursing students appear to have an association between confidence and competence items related to BP measurement (see Table 3). This may be problematic as students’ level of self-reported confidence may be high and they consider their competence to be high. This, however conflicts with their level of BP accuracy which was not associated confidence or competence. It may be that in first year nursing students understanding of clinical skills is not sufficiently refined to ascertain their true level of competence at this early stage of their training.

The frequency in which nursing students practise BP measurement skills, both during the semester and while on clinical placements, may influence student confidence and competence ratings and potentially BP measurement accuracy. This, however, was not demonstrated in this study. Clinical facilitators who identify students as lacking confidence/competence should provide adequate supervision to enable students to develop the skill as well as sufficient opportunities to practise in clinical simulation laboratories prior to embarking on clinical placement.

Importantly, it has been shown that nursing student’s self-rated confidence and accuracy in BP measurement improves during their first clinical placement. For example, Gordon et al. (2013), who previously compared students who underwent specific BP-related simulation-based learning with those who underwent conventional BP tuition, found that student exposure to clinical environments affects their perception of confidence and competence of BP measurement equally, irrespective of the method in which they were taught the skill. This is highly relevant as approximately 30% of student participant’s BP measurements in this study were not found to be clinically acceptable (> 4 mmHg from the clinical facilitators). This highlights the importance of exposing nursing students to opportunities to practice clinical skills such as BP measurement, while on clinical placement and for facilitation of these learning opportunities to be considered a priority by educators.

The amount of BP instruction is also likely to influence nursing students’ confidence and competence. It has been reported that improvement in BP technique and accuracy occurs when supplementary education is provided following basic BP instruction. For example, Ballard et al. (2012) reported that one hour of additional teaching significantly improved nursing students’ ability to measure BP accurately, which confirmed similar earlier findings reported by Brokalaki et al. (2008). Interestingly, however, there does appear to be a saturation point or clinical learning ceiling whereby excess tuition does not improve clinical competence. This reiterates the importance of clinical skill consolidation in the clinical practice environment.

There were several limitations of this study. First, it was conducted at a single-study site, which may restrict the generalizability. Furthermore, while taught using a gold standard technique, variations in participant’s BP measurement technique may have influenced the ability of the clinical facilitator to determine BP readings. For example, stethoscope diaphragm positioning over the brachial artery, BP cuff de-
flation speed, the size of BP cuff, and the placement of the stethoscope diaphragm at heart level may have impacted on the clinical facilitators’ ability to measure BP accurately, thereby affecting results. Anxiety levels were not formally assessed in the study. There was a possibility that elevated anxiety was experienced in those participants with, either or a combination of, lower confidence, competence or BP accuracy. Alternatively, although not measured, it may have been that self-reported confidence and confidence may have been affected by the assessment process. It has been reported that nursing students experience anxiety and stress during clinical practice and related to clinical performance.\(^{[28]}\) Importantly, these must be acknowledged when considering the findings of this study.

5. Conclusion

Findings from this study appear to suggest that the majority of nursing students are able to accurately measure blood pressure in the clinical setting during their first clinical placement. There appeared to be no systematic bias and many of the nursing students’ BP reading differences were not different from the clinical facilitators which we assessed as gold standard. Findings also showed the potential value of using clinical facilitator ratings of student confidence and competence when assessing BP measurement and accuracy skills. It was revealed that simple subjective assessments can be indicative of nursing student’s BP accuracy. Importantly, this may assist with determining the amount of supervision a nursing student may require when undertaking the skill; however, this should not be used as a “one size fits all approach”. Individual student factors including self-perceived confidence, competence and demonstrated clinical performance must also be considered.

To determine how clinical facilitator’s time, skills and knowledge and educational expertise can be utilised most effectively to support the development clinical skills, further research is needed. Applying subjective determination of competency to a wider range of psychomotor skills in clinical practice also requires investigation to ascertain if these can be used to support or substitute traditional objective measures which can be time-consuming and are prone to errors. The ability to measure BP accurately is an important skill for all registered nurses. Nursing students need the opportunity to develop these skills as part of their pre-registration educational program in both the on-campus learning environment and clinical placement setting. Clinical facilitators and registered nurses, with whom students work, must provide adequate supervision and encouragement in supportive manner to enhance learning, engender confidence and to promote quality patient care.

CONFLICTS OF INTEREST DISCLOSURE

The authors declare that there is no conflict of interest statement.

REFERENCES


