EXPLORING STUDENT NURSES’ AND NURSE EDUCATORS’ EXPERIENCES OF SIMULATION-BASED PEDAGOGY USING CASE-STUDY RESEARCH.

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ABSTRACT

Nurse academics are constantly facing new challenges from governmental and professional groups calling for the preparation of students to be able to work with increasing complex patient cases at a time of reduction in clinical placements (NMC, 2010a and b).

Simulation is a method that has been embraced, by some, for preparing for these challenges, with the potential to escalate student skills and knowledge in a meaningful way (Benner, 1984). The aim of this study was to explore and make explicit the characteristics that make simulation effective within nurse education. An explorative, qualitative case study was chosen to collect spoken data from twenty-four participants through focus groups. Participants included both students undertaking nurse training, and academics involved in the delivery of simulation.

Content analysis facilitated exploration of each participant’s contribution resulting in the emergence and construction of three themes (Creswell, 2007; Polit and Beck, 2014).

1. The approaches that academics use to integrate simulation into the curriculum;
2. The influences and decisions academics make to deliver simulation-based education, and their impact upon the student learning experience;
3. Evidence for the transference of skills to the realities of clinical practice.

A conceptual framework has been developed and presented through the data analysis process (Saldana, 2012), which has culminated in the presentation of a unique model for ‘Developing Simulation Practice in Nurse Education’ (DSPiNE).

The model relates to two key processes derived both during and following simulation activities (1) the preparedness for clinical practice, described as the process whereby the student gains insight into their current practice abilities; and (2) the transference to clinical practice, described as the process whereby the student gains insight into their readiness for future practice requirements. This study concludes that purposeful positive behavioural change could be achieved with the implementation of the DSPiNE model within nurse education.
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CHAPTER 1

INTRODUCTION AND BACKGROUND

This chapter introduces the background to nurse education and its main aims to improve the knowledge, skills and performance of students and, in doing so, improve the quality of nursing care and patient safety within clinical practice. The evolution of technology and growth of simulation are introduced, along with the educational underpinnings within nurse education that have encouraged innovation to take place. This chapter concludes with the theoretical influences that have impacted upon this practitioner as a researcher moving through the thesis on a professional practice journey.

I. The evolution of nurse education

In the 1980s, nurse education in the United Kingdom (UK) was transferred from hospital-based ‘schools of nursing’ to universities, a decision made after years of consultation carried out by the United Kingdom Central Council (UKCC) and presented a significant moment within the evolution of nurse education. It was soon after this move, the grand plan for the future of nurse education in the UK was detailed in the document named “Project 2000: A new preparation for practice” (UKCC, 1986). This was a very dramatic change from traditional nurse education; and was followed by much criticism of the educational methods used for preparing nurses for clinical practice (UKCC, 1999). The impact would be that alignment would be achieved to map to the changes happening in other countries at the time e.g. United States of America (USA) and Australia. The result was that
the very traditional apprenticeship style of nurse training was abandoned in favour of a more progressive and academic university-based education (Hughes and Quinn, 2013). The goal of the grand plan was to prepare nurses for a career of changing roles, lifelong learning and continuing professional development (CPD) (UKCC, 1999).

The resultant plan for preparation for practice involved many important decisions and issues being discussed by the UKCC regarding the future of nurse education (UKCC, 1999). One of the key issues involved the amount of time that students would spend in theory-and practice-based learning, and the specific role that they would take during their practice experience. Significantly, the move into universities meant that student nurses would no longer be regarded as part of the workforce; however, when the original Project 2000 curriculum was implemented, the final 20 per cent of student nurses’ time in practice was to be in ‘rostered service’ (UKCC, 1986) and as such, students would be counted in workforce numbers. This particular aspect of nurse training was considered essential by the UKCC to significantly enhance their preparation for their clinical role once qualified, however, preparation was lacking.

Over time, the implementation of rostered service caused some notable problems, because whilst this approach may have been advantageous in terms of staffing levels, it did not provide student nurses with the best possible learning experiences at the crucial time in their training i.e. in the final months before becoming a registered nurse. Many students found that, instead of being given additional learning opportunities and responsibility, they were more likely to be delegated the role of nursing assistants, which led to a situation that was not
conducive to learning the skills necessary to function as a qualified nurse (UKCC, 1999; Wellard et al., 2007; DoH, 2012). As a result, students were finishing their nurse training unprepared for the accountability, roles and responsibilities of a registered nurse (Sharif and Masoumi, 2005). In light of this criticism, the UKCC established a commission to examine the future direction of pre-registration nursing education, resulting in the Fitness for Practice (FfP) curriculum (UKCC, 1999). One of the key recommendations made by the report was a requirement that students be provided with consistent clinical supervision in a supportive learning environment during all practice placements; this effectively extended the supernumerary status of student nurses to the whole of their pre-registration programme (UKCC, 1999) and would allow for more practice of essential skills to take place.

The FfP report acknowledged that pre-registration programmes must meet certain requirements and provided a clear, on-going set of outcomes for commissioning bodies, higher education institutes, National Health Service (NHS) Trusts, mentors and students alike (UKCC, 1999). They all had a responsibility for ensuring that, at the point of initial registration, student nurses were:

- Fit for Purpose (competency based) – can function competently in clinical practice;
- Fit for Practice (professional legal and ethical outcomes) – can fulfil the needs of registration;
- Fit for Award (meeting academic standards) – have the breadth and depth of learning to be awarded a diploma or degree (UKCC, 1999, p56-57).
Ensuring student nurses are fit for purpose, practice and award has resulted in many professional discussions surrounding how best to achieve this. This has resulted in the huge interest in the way that technology for learning, including simulation techniques can support students’ clinical learning within the Higher Education Institution (HEI) from both the academic perspective and the literature base (Issenburg, 2005; NMC, 2007a, and b; NMC, 2010b).

Nurse education within the UK today continues to take place within two major contexts – the National Health Service (NHS) and the University sector – with dedicated hours (4600) being equally split between the two. It is within the 2300 practice hours that 300 hours can be given over to structured simulated practice (2007a and b). The Nursing and Midwifery Council (NMC) is now the governing body. It was set up by Parliament in 2001 and came into effect on 1 April 2002, to protect the public by ensuring that nurses and midwives provide high standards of care, and to replace the UKCC. The main objective of the NMC in exercising function was (and still is) to safeguard the health and wellbeing of the public through the setting of the standards of conduct, performance and ethics for all nurses and midwives (NMC, 2010a).

The standards of proficiency are also aimed at ensuring that students are prepared for the future requirement to be a lifelong learner and impending re-validation (NMC, 2010b; NMC, 2013). Whilst the NMC is responsible for laying down the Standards of Proficiency for Pre-Registration Nursing Education there is room for flexibility in the structure of the programme at the point of development and delivery locally (Boland, 2012; Humphreys et al., 2013). Notwithstanding this flexibility given locally, there has been debate regarding the broadness of the
educational underpinnings to nursing curricula, and indeed the focus upon a predominantly instrumental philosophy, i.e. their purpose is the production of a nursing workforce that is equipped to deal with the demands of the role, and like many other professions, vocational relevance remains a key principle within learning (Hope et al., 2011). That is not to say that nursing curricula omit the wider aspects of education such as the needs, aspirations and personal growth of the individual, but according to Hughes and Quinn (2013), these aspects have been considered to be secondary to the main purpose, in order to ensure that students have met the predetermined behavioural goals with the expectation that all students will meet all objectives and that has served to satisfy the accrediting body of the NMC (NMC, 2010b). The achievement of such goals and expectations is often started through a process of rehearsal and practice through task trainers developing into more sophisticated simulation using clinical scenarios as the student advances. However, despite this growth, evidence is limited as to what the characteristics of effective simulation are.

II. The Growth of Simulation as an Educational Pedagogy

New knowledge and technology within nurse education are currently proliferating at an exponential rate, and there has been a call for their integration in a timely manner (Nehring and Lashley, 2010; Aldridge and Wanless, 2012). Indeed, active learning techniques and inter-professional learning opportunities have been emphasised as essential to healthcare professional education in the twenty-first century (NMC, 2010b; Willis, 2012). The literature regarding simulation appears
to support the notion that it is necessary to provide the opportunity of rehearsal prior to working within clinical practice (Brydges et al., 2010; Hope et al., 2011; Levett-Jones et al., 2011). But there remains a paucity of literature and limited discussion about what constitutes the ideal characteristics of a simulation-based curriculum (Jeffries, 2008; Nehring and Lashley, 2010; Wilson and Rockstraw, 2012). Furthermore, there is little evidence of the transference of competence brought about through the use of simulation (DH, 2011), a criticism made previously from traditional-based ‘apprentice-style’ nurse education (Sharif and Masoumi, 2005; Wellard et al., 2007). There is inherent additional costs for embedding new technology and simulation within the curriculum, however, increased funding, training and support for academics has not been forthcoming (DH, 2011), perpetuating discussions around the value of simulation, for student learning, amongst the academic community.

Importantly, for academics working within simulation there remains no national standards or guidance for delivery (beyond existing professional standards). As an academic, the impact of the publication ‘National Simulation Strategy’ (DH, 2011) offers many points for consideration with regards to the effective use of simulation to support workforce development and ultimately improving patient outcomes. This strategy followed on from the publication of the Simulation Scoping Project of 2008, which identified emergent themes of high relevance to nurse education (WMSHA, 2009). The key emerging themes from the scoping project were:

- Simulation-based training is widely used and can provide low-cost, high-volume educational solutions for undergraduate training, and
provides a valuable resource to trusts for clinical staff training and assessment;

- Simulation has an important role to play in improving patient safety. Clinical teams can use simulation to develop their skills and develop their leadership and teamwork without risk to patients. It is also possible to practice responses to rarely occurring incidents;

- Simulation provides an opportunity to provide intense training and feedback in a carefully controlled environment that may help improve training despite reduced working hours (WMSHA, 2009, p57).

Whilst there is clear recognition of issues associated with skill acquisition during undergraduate nurse training (DH, 2010), there is limited evidence about what might constitute a solution, and the value of simulation continues to be questioned within the academic community (DH, 2011). Nurse professional preparedness continues to follow a typical apprenticeship model, and this is not unique to nursing; indeed, medicine follows a similar process (Gaba, 2004; Nehring and Lashley, 2010). Whilst some researchers have reported that simulation training was beneficial (Alinier, 2003; Fountain and Alfred, 2009), others reported that confidence and level of performance were not correlated to simulation training (Alinier, 2003; Scherer et al., 2007; Warne et al., 2010) a confusing position for an academic when determining a best practice approach, and provides rationale for this study, in determining what is the best practice prior to implementing any change.
Further to this, students have reported stress when working in a technological environment, as well as a lack of confidence (Radhakrishnan et al., 2007). Students learn and reach competence at different rates, as such competency-based advancement has been reported to be more efficient than time-based advancement – currently all student nurse placements are time-limited (Bland et al., 2011) and using simulation as an adjunct may have the potential to overcome some of these constraints. In addition, not only are clinical placement areas decreasing, but also the quality of the available sites is variable – an issue recently outlined in the Francis Report (2013). Academic staff can only hope that nursing students obtain comparable clinical experiences, disappointingly, student clinical placement evaluations suggest otherwise (Sharif and Masoumi, 2005; Warne et al., 2010).

III. Educational underpinnings

In adopting a simulation-based pedagogy within nurse education, student learning is considered to be consistent with the educational principles of and adult learning (Baumgartner, et al., 2003; Rosenfield and Rosenfield, 2006; Reilly and Spratt, 2007). Pedagogy, within this context, is used to mean the theoretical basis underlying the learning and teaching process, the way this knowledge is constructed and shared within the community. The principles within a constructivist approach emphasises that students create their own meaning and knowledge through the interaction and engagement opportunities within a given simulated experience (Vygotsky, 1978; Lave & Wenger, 1991; Dabbagh and Bannan-Ritland, 2005; Forrest and McKimm, 2010). Blended with the principles of adult learning, simulation aims to promote the ideal that individuals’ take
responsibility for their own learning through the opportunities afforded through practice and rehearsal within a safe environment where escalation and enhancement of their own practice can occur (Baumgartner, et al., 2003; McGaghie et al., 2010).

Within the delivery of nurse education, the most influential theoretical underpinning is that of constructivism (Rosenfield and Rosenfield, 2006; Parker and Myrick, 2009). This resonates well with nurse education as at its best it has the potential to facilitate exploratory and inquiry-based scholarly pursuit within student learning (Giddens and Brady, 2007; Yilmaz, 2008). Rather than continuing to learn an ever increasing amount of content, students need to develop the skills to take responsibility of knowledge acquisition in order to make complex patient care decisions based on assessment, credible evidence, critical thinking, and clinical reasoning (Baumgartner, et al., 2003; Levett-Jones, 2013), essential skills for professional nursing practice. To summarise, a working definition of simulation-based pedagogy is presented, ‘an approach to learning and teaching using the techniques of simulation to bring about constructive, adult centred learning opportunities to enhance individual professional practice, that represents actual or potential situations that the learner may encounter in clinical practice’.

IV. Practitioner as researcher

As a reflexive practitioner-researcher, both professional practice and on-going professional development are acknowledged to be inextricably linked to situational knowledge and the gaining of deeper understanding, and have shaped the
theoretical framework for this thesis (Thomas and Pring, 2006; Burton and Bartlett, 2005). Indeed, professional insights and judgements about a simulation-based pedagogy in practice have been generated through an eclectic, democratic and coherent form of inquiry over many years and are drawn upon here to support this thesis through research-on-education (Elliott, 2006). Effective educational research is capable of producing what Stake (1978) termed naturalistic generalisations, which can provide a strong evidence base for future educational research and practice (Goding and Edwards, 2002) and this is an inherent notion within this doctoral thesis of reflexivity and openness, to break free from personal beliefs that may be limiting.

These underpinning notions and researcher expertise within nurse education translate well to the adoption of a constructivist framework within this thesis. Constructivist inquiry advocates that researchers generate knowledge from experience and reflection (Ghezeljeh and Emami, 2009). Within this is the implication that the findings are outcomes of the interactions between individuals within a particular social context, rather than phenomena ‘out there’ and separate from those involved in its construction. Indeed, the researcher and the participants interacted during data collection and thus the knowledge has been constructed through the lens of the researcher’s interpretation of the data (Markey et al., 2014). Thus, the inherent aim was to create a sense of reciprocity between the participants and the researcher (Charmaz, 2006) and objectivity could be enhanced. Inquiry into developing a simulation-based pedagogy will inevitably diverge (each question may raise more questions than it answers) so whilst prediction and control are unlikely – it is believed that a level of understanding could still be achieved (Barton, 2008).
The enquiry within this thesis has its antecedents within the questions “How do I improve my practice?” and “How can I share this within my own community?” with the intention to create something better (Wong, 2003). Throughout the Professional Doctorate process the researcher engaged within the research interest area, reviewing research problems and research questions, in order to discover new research avenues for exploration. This professional journey undertaken compels the documentation of personal reflections, conflicts, goals and values within an extensive portfolio, which have directed the researcher’s personal action and research plan (Schon, 1983; Wenger, 1998; Eraut, 2007). Maintaining a reflective diary has been an important expression of reflexivity during this process and sought to highlight how the researcher’s history and personal interests brought her to the research and demonstrated how the theoretical perspective affected data collection and research (Alvesson and Skoldberg, 2010). Furthermore, peer debriefing was utilised to offer depth to the process of inquiry and reflexivity during the professional doctorate journey as a learning technique (Eraut, 2007; Alvesson and Skoldberg, 2010). This was considered a facilitative, enabling process contributing to knowledge, understanding and addressing research challenges from a personal perspective (Lincoln and Guba, 2008).

Further, the previous creation of scenarios in simulation, grounded in theory, could provide opportunities for rich, contextual, and multi-layered learning experiences to be described and explored at both the level of the individual and through group processes (Harder, 2009; Forrest and McKimm, 2010; Dieckmann and Ringsted, 2013). In seeking to explore and describe the derivation and nature of learning gained from simulation at its best the tacit knowledge and
beliefs of oneself and the participants, combined with the evidence base, could be difficult to separate (Carolan, 2003; Eraut, 2007). As such, it is acknowledged, recognised and embraced that tacit knowledge plays an important role in addressing the key aim within this thesis. Indeed, the findings from this research are perceived to be multiple, constructed and holistic, where the researcher and participants are interactive and, at times, inseparable (Lincoln and Guba, 2008). Reflection, from this perspective, is acknowledged as not solely a one-person act; rather it requires social interaction and dialogue with others as well as oneself (Betts 2004) in order to establish in-depth meaning. Furthermore, it has been detailed by Burke and Kirton (2006) that approaches that support researcher knowledge enhancement from an insider perspective and at the localised level are of great value in developing more nuanced and complex understandings of educational experiences, identities, processes, practices and relations.

It is with these influences in mind, particularly with the personal belief in the way in which knowledge is created and used by practitioners in the context of their practice, that the epistemological stance of constructivism has been embraced. In situating the study within the theoretical framework of social constructionism, experience, reflection, interpretation and consolidation feature widely (Fosnot, 2005; Terry, 2015). Indeed a key purpose within this thesis is not just to push the boundaries of knowledge but to break free from limiting personal beliefs about the way things should be based on previous experiences and practices (Alvesson and Skoldberg, 2010).
V. Conclusion

Today’s student nurses live in an age of accelerated knowledge generation, rapid demographic changes, and exponential technological advances (Forrest et al., 2013). These exist both within the learning environment of the HEI, and within the NHS, which are two key areas where student nurses must learn and also work (Campbell and Daley, 2013). The implementation of simulation is progressing within HEIs and whilst a simulation-based pedagogy may have the potential to provide realistic learning experiences (Fountain and Alfred, 2009), best practice and evidence regarding the value and outcomes remains largely unexplored.

Since simulation has been approved as equivalent to clinical practice (NMC, 2007a and b) it is intended through this thesis to determine greater understanding of the application of simulation to nurse education and to explore frameworks that academics are using to drive the outcome of fitness for practice (DH, 2011). This investigation has the potential to further academics’ understanding of current practice, enhancing the learning experience and the potential for transference of professional competence to the clinical work place (NMC, 2010a and b).

Through a review of the literature, the following chapter synthesises the nursing research regarding the current simulation practice within HEIs and the pedagogical underpinning, with the aim to identify and describe the characteristics that impact upon learning from simulation.
CHAPTER TWO

LITERATURE REVIEW

I. Introduction

New knowledge and technology within nurse education is currently proliferating at an exponential rate; this is matched with changes to the delivery of healthcare, many of which need to be integrated into the nurse curriculum (Nehring and Lashley, 2010). Active learning techniques and inter-professional learning opportunities have been emphasised as essential to nurse professional education in the twenty-first century (NMC, 2010a). Tanner (2006) called for a transformation of nurse education based on increased patient acuity and complexity, decreased numbers of clinical placement areas, increased costs of clinical placements, inefficiency of student time whilst on placement, and the academic shortage, among other factors. She advocates that innovative ways to meet the clinical learning outcomes need to be developed and these are still true today.

Simulation has already become established within medical education, and following the NMC pilot project (NMC, 2007a and b) simulation is increasingly being used within nurse education (Harder, 2009); there is currently growth within nursing scholarship too (Nehring and Lashley, 2010; Wilson and Rockstraw, 2012). Several papers have been published with the aim of demonstrating the effect of simulation-based training, but despite the increasing amount of evidence
indicating the positive effect, research in the field of nurse education remains in its infancy (Amitai et al., 2000; Bradley and Postlethwaite, 2003; Jeffries, 2005; Bambini et al., 2009; McGaghie et al., 2010). Campbell and Daley (2013) acknowledge that there are gaps in the literature and challenges expressed, particularly with regards to meeting the demands of this new technology within the realm of academic shortages and workload. Yet they still conclude that the potential benefits are clear, especially with regards to enhancing critical thinking beyond protocol and clinical pathways (Campbell and Daley, 2013). Nurse academics are increasingly using simulation in a variety of forms as an adjunct to enhance the learning and teaching encounter (Nehring and Lasley, 2010). The increasing popularity of this technology largely reflects the need to assure the public that nursing students are safe and competent to practice upon graduation (NMC, 2010b). From this point nurse teachers, educators, lecturers and academics will be referred to as ‘academics’ to ease clarity within terminology.

It has long been established that part of the nursing educational experience needs to involve time in the practice setting; currently being half of designated training hours, which equates to 2300 hours (NMC, 2010a). Yet, these clinical placements cannot be standardised; indeed, practicing skills and procedures for the first time on patients raises ethical considerations (Ostergaard and Rosenberg, 2013). Furthermore, clinical placements are not consistent in what they offer a student nurse (Warne et al., 2010). This leads to nurse students inevitably receiving varied experiences in which the patient load and acuity prevent them from consistent and standardised opportunities to practice their psychomotor, psychosocial and team-working skills, which would ensure competency across all areas of care (NMC, 2010b; Campbell and Daley, 2013).
Simulation is increasingly being reported as a safe, structured and supportive method for nurse students to learn within (DH, 2011), whilst also being recognised as having the capability to provide standardised experiences to assist in the progression to competence and seeming to meet the requirements of the patient safety agenda (Berragan, 2011). From a student perspective, there is a greater opportunity for experiential learning to improve performance (Reilly and Spratt, 2007), when learning through trial, error and repetition (Kardong-Edgren et al., 2011). Simulation offers permission to fail, a notion which would be classified as a ‘never event’ within clinical practice (Levett-Jones et al., 2011).

This chapter presents the literature review, which will identify current simulation practices, the pedagogical underpinning, with the aim of identifying the characteristics that impact upon learning from simulation within nurse education.

The literature review will address the following aim:

To explore and describe the characteristics that makes simulation effective within nurse education.

The following questions will be the focus of the exploration of the literature:

- *How is simulation integrated within nurse education?*
- *What evidence exists as to the best way to teach simulation within nurse education?*
- *What makes a good facilitator of simulation within nurse education?*
- *Can simulation improve clinical nursing practice?*
Currently much of the theoretical debate around simulation originates from medical literature (Issenberg, 2005; Kneebone et al., 2010; McGaghie et al., 2010). The nursing literature on simulation tends to be more descriptive than critical reflexive, giving accounts of the potential of simulation and guides to incorporate simulation within the curriculum (Jeffries, 2007; Harder, 2009; Aldridge and Wanless, 2012). Within this thesis these papers are important in so far as raising awareness and demonstrating the work already in progress, however, an increased understanding of the educational basis is considered to be fundamental. Within this section simulation will be defined, the systematic approach utilised within the literature review detailed and finally a synthesis of the literature will be thematically presented.

II. A synthesis of the nursing research that uses simulation within education

While there is evidence within the literature of the benefits in the inclusion of simulation within the undergraduate-nursing curriculum, there are also some concerns. The literature demonstrates that simulation can be an effective teaching methodology, but consideration must be given to its capacity to translate into practice (Starkweather and Kardong-Edgren, 2008; Wilson and Klein, 2012). Berragan (2011) emphasises that whilst applauding the benefits and possibilities of simulation for clinical skills development, concerns are raised about the “wholesale” and uncritical adoption of this pedagogical approach. She further contends that nurses gain their professional identify through their interaction with
patients. Whilst the social element of the nurse’s role links well with theories of learning which highlight social participation in communities of practice, Berragan (2011) supports the notion that it is the engagement with reflexivity that enables a student to learn “how to be a nurse” as well as how to perform the clinical skills required to care for their patients. Here the focus moves towards identity construction, encouraging the student to learn how to “think” of the job as well as how to “do” it (Nehring and Lashley, 2010).

**Defining Simulation**

A simulation has been described as an imitation of some facet of life, usually in a simplified form. It aims to put learners in a position where they can experience some aspect of real life by becoming involved in activities that are closely related to it (Hughes and Quinn, 2013). Rowles and Brigham (1998) offer a broader definition emphasising the element of being a representation of an actual life event, which includes manikins, case studies, games, role play and computer software (Bracegirdle and Chapman, 2010). It is frequently claimed that controlled and risk-free encounters that replicate real life scenarios facilitate the acquisition of key skills, behaviours and knowledge prior to transferring these to clinical practice (Daley and Campbell, 2013); as such, a planned rehearsal (Roberts and Greene, 2010).

Within health care education there are two key types of simulation modalities: computer based simulation tools within which the student will work through a computer programme answering questions and making clinical decisions, known as ‘virtual simulation’; and advanced human patient simulators (AHPS) which can be described as a human mannequin animated with a variety of
electromechanical or pneumatic devices that produce respiratory movement, palpable pulses, heart and lung sounds and realistic airway anatomy (Laerdal, 2014), and which will be referred to as ‘physical simulation’.

One of the most recent definitions posed in response to the growth of simulation within healthcare education is by the Department of Health. They have attempted to remove the complexity surrounding previous definitions within the publication, framework for technology enhanced learning (DoH, 2011, p12) they assert that:

“Simulation refers to any reproduction or approximation of a ‘real’ event, process, or set of conditions or problems. In this sense, learners are expected to evaluate and act in the same way as they would in the real situation, thereby supporting learning in a ‘patient safe’ environment, as well as potentially increasing competence by deliberate and repeated practice. Simulation is also used for the assessment of the level of competence of individuals and teams.”

This definition will be utilised within this thesis as it encompasses the essential elements, and offers a workable construct, which maps to the literature review questions in order to capture the essence of effective simulation integration within nurse education. The particular elements that have strong resonance with this study are considered to be: reproduction, approximation of a real event, students acting as they normally would in practice, supporting patient safety, and the opportunity for repeated practice. Furthermore, the majority of these elements are often cited within the simulation literature and specifically relate well within the nurse education arena. Whilst simulation embraces computer gaming and virtual environments, the focus of this review and thesis will be upon simulation that utilise manikins– ‘physical simulation’. A full glossary of terms is presented within Appendix 1.
III. Literature review method

The literature reviewed and analysed was limited to papers published in English with selected material retrieved and reviewed in full to gain understanding of the use of simulation within nurse education. It was considered important that the selection criteria only considered reviews relevant to nursing and so the broad term of nursing was used consistently within the inclusion criteria, with the research aim and questions at the forefront of the appraisal. Several key search terms were used to carry out the literature search using the following indexes: CINAHL (Cumulative Index of Nursing and Allied Health Literature), MEDLINE databases that contain biomedical literature, and Web of Knowledge. These indexes relate to Nursing and Allied Health Care Professionals and are considered to offer international resources, covering English and foreign reference materials (Polit and Beck, 2014) with the advantage of offering relevant journals, books and report articles that are readily available. Whilst the year 2000 was targeted as an appropriate cut-off date, permitting an overview of literature over the past fourteen years, there are some key seminal educational papers that have been included for completeness as they provide insight into the historical context of nurse education (Table 1 details the overview of inclusion and exclusion criteria).

The vast majority of papers spanned the last decade originating from United Kingdom, Europe, Australia, Canada and United States of America. The analysis was limited to papers published in English with selected material retrieved and reviewed in full to gain understanding of the use of simulation. Further studies
were excluded where the primary variable included either reference to virtual simulation, web based simulation, clinical skills or medical/surgical skills training.

It was considered important that the selection criteria only considered reviews relevant to the use of simulation in nursing and so the broad term of nursing was used consistently within the inclusion criteria, with the literature questions at the forefront of the appraisal. Fourteen full text journal articles were selected for inclusion, with 10 of these being primary studies offering insight into the current use of simulation within nursing; reference lists were searched which provided a further two papers of relevance for inclusion bringing the total to 16 studies. Appendix 2 extends full details of the literature review process and method. During the literature review important evidence sources were referred to within the primary studies, some of these were from other professions for example medicine and allied health professions. In order to attempt to be inclusive of all relevant simulation research these studies were also included, as appropriate, to support the key findings within the literature review.

<table>
<thead>
<tr>
<th>Inclusion and exclusion criteria</th>
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<tr>
<td><strong>Primary inclusion data</strong></td>
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<tr>
<td>2000 to present day</td>
</tr>
<tr>
<td>Simulation within pre-registration nursing</td>
</tr>
<tr>
<td>Facilitation within simulation (includes debriefing)</td>
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<tr>
<td>Pre-registration nursing education</td>
</tr>
<tr>
<td>International papers</td>
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<td>English language</td>
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Table 1: Inclusion and exclusion criteria within literature review method.

Each of the studies included within the literature review were appraised for methodology, rigour and quality following the guidelines provided by the Centre for Reviews and Dissemination (CRD, 2009) using an adapted framework (Greenhalgh, 2014) and this is further detailed within the data extraction framework at appendix 3. The strength of evidence score was based on the hierarchy of evidence ranking scale devised by Evans (2003) and makes reference to the effectiveness, appropriateness and feasibility of each study appraised, which provides a broader base for evaluating healthcare research.

An integrative synthesis framework was applied during the literature review (CRD, 2009); this was appropriate given the heterogeneity of the research articles’ methodologies (Popay et al., 2006). A qualitative thematic analysis was used to systematically and deductively identify the main, recurrent and most important themes and concepts within simulation pedagogy (Creswell, 2007). From the synthesis beliefs regarding the characteristics that contribute to an effective learning environment within simulation emerged. These elements have been synthesised to focus upon achieving the aims of this study: to explore and describe what makes simulation effective in order to capture the ‘best’ of these approaches, and to determine what can be shared within the community of practice in terms of distilling the characteristics of effective simulation.

Four themes were consistently evident throughout the thematic analysis and these were:
• Theoretical and conceptual drivers
• Simulation design characteristics
• Facilitation within simulation
• Transference to the reality of nursing practice

The themes are quite broad, but reflect the current issues topical within the literature that are relevant to the aim and questions of this study, and assists in highlighting where future research energies could be directed within this study.

**Theme 1: Theoretical and Conceptual Drivers**

Within the theme ‘theoretical and conceptual drivers’ exploration of how simulation has been integrated within nursing curricula, as evidenced from the literature is detailed. It includes the educational theories and frameworks commonly used to drive simulation activities. Many faculties responsible for the delivery of nurse education are purchasing the necessary equipment for a simulation laboratory, and the integration within existing curriculum can often be a significant challenge (Starkweather and Kardong-Edgren, 2008; Wilson and Klein, 2012). However, it has been recognised that staff training, space allocation, student and lecturer evaluation and change to typical teaching ratios can be a costly endeavour (Parker and Myrick, 2009; Berragan, 2011). Campbell and Daley (2013) highlight how many academics arrive at simulation and describe it as one of two approaches a) a clear vision for how things should be done with little or no financing or b) a well-financed initiative with no schematics for implementation of something called the ‘simulation lab’. If simulation pedagogy is to develop within nurse education it is important to explore the underlying
Theoretical and conceptual drivers that serve to inform this educational approach (Bland et al., 2011).

The key theoretical driver within nurse education is the curriculum of the programme, which is the foundation of learning (Campbell and Daley, 2013). As Leddy (2007, p68) states, ‘the curriculum is the totality of formal and informal content that imparts the skills, attitudes, and values considered important in achieving specific educational goals’. Further, it has been reported that the best outcomes within simulation occur when it is integrated within the curriculum, rather than put in on top of an already crowded ‘content-saturated’ curricular (Giddens and Brady, 2007); a ‘bolt-on’ or after-thought is simply ineffective (Starkweather and Kardong-Edgren, 2008), but is something typically seen within developing education with an inherent fear of letting something go. Indeed, the theoretical drivers within the design suggests that effective learning is most likely to be achieved if the learning outcomes, the teaching and learning activity and assessments are tightly aligned (Biggs, 2003). Additionally, if strategic impact is to be optimised then the learning outcomes of a simulation focussed curriculum needs to address key benchmarks in terms of the practical skills needed and how they will be developed (Hope at al., 2011; Arthur, et al., 2013; Ostergaard and Rosenberg, 2013).

According to WMSHA (2009), these benchmarks fall into two categories:

- Skills development associated with aspects of practice that are rarely encountered, and therefore experienced by staff, but whose occurrence may have significant consequences e.g. safeguarding vulnerable children;
- Skills development associated with aspects of practice that in terms of morbidity, mortality and finance represent significant and regular risk to the NHS. E.g. communication skills development, infection control, reporting and monitoring (WMSHA, 2009 p193).
Campbell and Daley (2013) purport that when simulation is viewed as an educational tool it aligns well with the theoretical and conceptual driving foundations of nursing education.

A limited array of conceptual models and frameworks have been proposed and utilised to capture and drive the curriculum and the role of simulation within nurse education. One of the early models describes a simulation protocol, which was formulated at the University Of Maryland Baltimore School Of Nursing (Larew et al., 2006). This protocol was based on the early work of Benner (1984), and uses a cue-based system with escalating prompts to move students through recognition to assessment to intervention to problem resolution, and maps to the escalation of novice to expert that Benner details within her work (Benner, 1984). Indeed, Benner’s work is not new within nursing education; it has been the cornerstone to many nursing curricula as the underpinning model for progression both within theory and practice based learning. Taking this further, Waldner and Olson (2007) present a framework for utilising both Benner’s (1984) skill acquisition model and Kolb’s (1984) experiential theory, specifically to guide academics in their decision making regarding teaching method within nurse education. The perceived value here is to escalate and drive student learning through reflecting upon practice.

Within the original work of Benner (1984) distinctions are made between five levels of competency: novice, advanced beginner, competence, proficiency and expert. Differentiation among the levels is determined by the nurses’ focus of attention, involvement in the situation, and perception of responsibility or accountability. By contrast, Kolb (1984) describes a process of learning through
experience that begins with the learner having an initial experience. The learner makes that experience meaningful by reflecting on it; the meaning the learner gleans from the experience through reflection is then conceptualised and incorporated into existing cognitive frameworks.

This expanded knowledge (cognitive framework) is then applied to a new situation where experience again is gained, reflected upon, conceptualised and incorporated into the knowledge base (Waldner and Olson, 2007). In this sense, the learner would learn both ‘through’ and ‘from’ the experience: through the experience by doing, and from the experience by reflection (Dillon, 2002), a notion shared originally in previous work (Kolb, 1984; Boud et al., 1985). Waldner and Olson (2007) claim that the transformation from novice to expert nurse occurs when experience is incorporated into existing knowledge patterns through a process of active reflection and conceptualisation of experience; however, it is claimed that, in order to gain such transformation, the skills involved within this process would need to be integrated throughout the curriculum (Jeffries, 2007). This further supports the notion of embedding simulation within the theoretical framework of the curriculum, where revisiting experienced would be key (Giddens and Brady, 2007).

The participants within the study by Scherer et al (2007) found that working within an educational environment where simulation was utilised particularly challenging, importantly, the University within this study did not routinely adopt simulation within their curriculum – therefore, students had little previous experience and were unfamiliar with this approach to learning. The majority of studies would consider this approach an inappropriate introduction to, and use of, such an
active-based methodology (Berragan, 2011; Hope et al., 2011; Kable et al., 2013). The study carried out by Scherer et al. (2007) was designed to compare the efficacy of controlled simulation manikins with a case study to assess student nurses’ knowledge and confidence. Perhaps, and unsurprisingly, all of the participants within the simulation group found the experience stressful and challenging; this is a contradictory finding to those academics that embedded simulation within their curriculum (Lasater, 2007; Dieckmann and Ringsted, 2013; Gale and Roberts, 2013).

Some researchers do explore the use of an approach for the application within individual classroom simulation-based sessions (Scherer et al., 2007; Parker and Myrick, 2009), they do not consider the value of embedding the pedagogy within the wider curriculum as other theorists have (Giddens and Brady, 2007; Lasater, 2007; Starkweather and Kardong-Edgren, 2008; Arthur et al., 2013). Parker and Myrick (2009) assert that it is the actual desired goal of simulation that would encourage the nurse academic to draw on one educational philosophy over another; therefore, embedding potentially removes this flexibility. These researchers further explore the value of two competing educational methodologies within their review; they believe that both constructivism and behaviourism can provide a basis for the incorporation of simulation within the nursing curriculum (Rosenfield and Rosenfield, 2006; Parker and Myrick, 2009).

From the papers reviewed, it is evident that both constructivism and behaviourism have been integrated successfully within nursing curricula (Jeffries and Rizzolo, 2006; Bland et al., 2011; Ricketts, 2011). Parker and Myrick (2009) consider that behaviourist-based simulation is more effective in the development of
psychomotor skills and rote learning of factual knowledge. Conversely, constructivist-based simulation is deemed more valuable in developing clinical-judgement skills, problem solving, collaboration, and group process (Levett-Jones et al., 2013). Whilst Parker and Myrick (2009) discuss educational underpinnings they do not acknowledge individual differences to learning processes, in the way that Fountain and Alfred (2009) or indeed, Sewchuck (2005) does. Furthermore, such an approach would suggest that the academic has the necessary expertise to work in such a proactive and dynamic way in supporting experiential learning, but some have reported that this is not always the case (Leigh, 2008; Fountain and Alfred, 2009) and academics have reported the implementation of simulation is, as a matter of fact, a big challenge (Scherer et al., 2007).

It is apparent that the specific educational framework chosen is considered to have a level of impact upon the learning outcomes (Jeffries, 2007). Within nursing simulation the outcomes often focus upon developing clinical-judgement skills, collaboration and team working (Levett-Jones, 2013), and with patient acuity increasing it could be suggested that the constructivist model may best appeal.

One of the most referenced theoretical frameworks, within the literature, is that of Jeffries and Rogers (2007), which appears to have been embraced by the simulation community, and is often referred to as an eclectic approach to formulating a simulation framework that provides the basis for an holistic and flexible approach (Smith and Roehrs, 2009; Arthur et al., 2013). As part of an original, extensive, multi-site study, Jeffries and Rizzolo (2006) developed a guide
for nursing academics to design high fidelity clinical simulations (Jeffries and Rogers, 2007). The study was carried out in four phases, with the model and instrument development included in the initial phase and paper publication.

The theoretical framework is presented as an appendix to the study ‘Nursing Education Simulation Framework’ and intriguingly no explanation or reference is made to it within the paper itself. However, it is developed in later work from Jeffries and Rogers’ (2007) in a study where eight project directors (with the assistance of nursing academics) used the framework to design implement and evaluate a simulation experience at their site during the second phase of the study. Whilst the results from this phase are not included in the report, resulting in a lack of knowledge regarding how the model was actually used to design and implement the simulations, there is clear evidence from the literature that academics continue to consider it as a relevant theoretical framework to drive simulation activity (Wilson and Klein, 2012).

During the third phase of Jeffries and Rogers’ (2007) study, 395 students were randomly assigned to one of three conditions – paper/pencil case study, simulation with moderate fidelity simulator, and simulation with high fidelity. They reported no significant difference in knowledge based on post-test score comparisons. However, learners using the high fidelity simulation scored higher than those in the other groups on satisfaction and self-confidence measures, a finding also reported by others (Scherer et al., 2007; Hope et al., 2011). Furthermore, student perceptions of the incorporation of active learning, feedback and diverse learning styles were significantly increased with high fidelity
simulation, again supported by others in the field (Hope et al., 2011; Arthur et al., 2013; Kable et al., 2013).

Jeffries and Rogers’ (2007) framework consists of three major concepts: outcomes, contextual elements, and design elements. The outcomes of a nursing simulation include knowledge acquisition, skill performance, learner satisfaction, critical thinking, and self-confidence; however, no detail is given about the tool used to measure these aspects. Focus on learner satisfaction is currently emerging (Kable, 2013) but this is still in the pilot stages. Contextual elements are the students and academics, their backgrounds and experiences, as well as educational practices embedded in a particular setting (Jeffries and Rogers, 2007). Contextual aspects have been considered within other studies with regards to what the students bring with them to the academic setting, which is described as a pre-set combination of individual experiences and culture (Daley and Campbell, 2013), both of which have been reported as a lens through which learning experiences are viewed (Ostergaard and Rosenberg, 2013). Design elements are included as objectives, fidelity, problems solving, student support, and debriefing (Jeffries and Rogers, 2007).

Wilson and Klein (2012) undertook an investigative study to test the validity of this pioneering framework within their own teaching arena. They concluded that the results did, indeed, confirm the usefulness of the tool. Some weaknesses were shared, in so far as the model provided minimal guidance in design instructions to prepare students for using simulation and for structuring guided reflection, with particular regards to structuring the debrief; this element is considered one of the most important aspects within simulation design (Dreifuerst, 2009). Although
omitted from Jeffries (2005) early work, there is growing evidence to support a debrief within the 'simulation design characteristics'.

**Learning Styles**

Questions have been asked about whether it is the learning style of the student that correlates to satisfaction with simulation, or the way it is integrated within the curriculum (Fountain and Alfred, 2009). Utilising learning styles information has been reported to increase the potential for student success (Amerson, 2007). An interesting finding from Fountain and Alfred's (2009) correlational study, with 104 undergraduate nurses, was that students with a preference for solitary learning and those with a strong preference for social learning were most satisfied with the simulation-enhanced learning experience; whilst a preference for social learners has been reported elsewhere (Bland et al., 2011) that of the solitary learner has not and appears to be unique. Fountain and Alfred’s (2009) study draws on the theory of ‘multiple intelligence’ learning to identify different categories of learning styles; the students who participated, routinely undertook a test prior to admission to the nursing programme (Gardner, 2006). They articulate their results on social learners benefitting by comparing, listening, networking, and interacting with others, a frequently reported finding within the application of simulation (Jeffries and Rizzolo, 2006; Leigh, 2008; Parker and Myrick, 2009).

Small-group activities, such as those offered in this type of lab activity, allow the group to discuss an issue and facilitate problem solving (Fountain and Alfred, 2009). They present the findings with regards to solitary learners as preferring to work independently, observing the actions of others, using reflection and completing self-paced projects, and as such the solitary learner is actively
learning by watching others; this is a unique finding, which merits further exploration. Fountain and Alfred (2009) conclude by suggesting that the experiential learning opportunities offered within simulation increase the student’s ability to synthesise critical content, a notion shared by several others (Starkweather and Kardong-Edgren, 2008; Berragan, 2011; Levett-Jones, 2013). This has great significance for preparing student nurses for their future work within clinical care where complex care and multi-morbidity are ever increasing (NMC, 2010a and b).

Learning styles are conceptualised in various ways with differing theoretical underpinnings. Whilst Fountain and Alfred (2009) utilised the notions of solitary versus social learning styles, Sewchuck (2005) considers four different learning styles and how they are addressed within experiential learning theory. *Accommodating* learners learn from experience and internalise learning through active experimentation. *Diverging* learners also learn best from experience, but they internalise the knowledge by reflecting on the experience. *Converging* learners learn from abstract ideas and internalise the abstract ideas by experimentation. *Assimilating* learners learn from abstract ideas and internalise those ideas through reflection. In support of this, Kolb (1984) categorised nursing as a profession that attracts accommodating and diverging learners with regards to learning through experience, which perhaps goes some way in explaining the reported increase in preference that student nurses have for this method of delivery (Parker and Myrick, 2009).

Interestingly, in drawing commonalities, within both Lasater’s (2007) study and the simulation study undertaken by Jeffries and Rizzolo (2006) strategies were
incorporated to include another four differing descriptive learning styles: the visual, the auditory, the tactile and the kinaesthetic. Lasater (2007) details examples of how each of these reported preferred styles could be incorporated within a scenario, concluding that this excluded any bias towards learning for the more active-experiential preferred learner (Jeffries and Rizzolo, 2006). The articulation of a scenario that appeals to differing learning styles is supported by Ricketts (2011), who emphasises that simulated learning encompasses the three domains of learning (cognitive, psychomotor, affective and human factors), and as such, will appeal to all student nurses.

Of great importance more recently is the increased attention to human factors and non-technical skill development within students, simulation can work to address these aspects too notably, through team working and communication (Rosenorn-Lanng, 2014). What can be summarised from these studies is that there is some evidence that the potential for a negative impact of learning styles within the simulation event can be minimised as the various stages of a simulation event unfold, the experience could appeal to all. This aspect could relate to the students predominantly positive experience in terms of their learning and active involvement (Sewchuck, 2005; Jeffries and Rizzolo, 2006; Fountain and Alfred, 2009; Parker and Myrick, 2009).

To conclude the theme of Theoretical and Conceptual Drivers, there is a body of evidence supporting the embedding of simulation within nursing curricula through the theoretical and process elements of curriculum design (Giddens and Brady, 2007; Starkweather and Kardong-Edgren, 2008; Parker and Myrick, 2009). Whilst there is limited evaluation, there is emphasis upon the notion that the best
outcomes can be achieved if the simulation is integrated within the curriculum rather than as a ‘bolt-on’ at the discretion of individual academics’ (Levett-Jones et al., 2011; Arthur et al., 2013).

There is not a common consensus as to the specific underpinning educational pedagogy; however, there is strong alignment with constructivism to best meet the educational needs of the student nurse (Parker and Myrick, 2009; Bland et al., 2011). Whilst some researchers draw on learning styles, there is limited discussion regarding characteristics that specifically relate to active participation and engagement within the simulation event (Sewchuck, 2005; Leigh, 2008; Fountain and Alfred, 2009). Whilst simulation has the potential to be integrated at some point within every course, some aspects of successful implementation depend upon the utilisation of the features associated with positive learning and the readiness of academics that are able to facilitate in a flexible way within the simulation event (Hope et al., 2011; Wilson and Klein, 2012).

Having explored the evidence for the integration of simulation within the nursing curriculum and the evidence regarding theoretical frameworks to drive the delivery of structured sessions, the next theme will explore and draw together the elements of the simulation experience through the articulation of the design characteristics. Whilst an introduction to these has been made within the seminal work of Jeffries and Rogers (2007) a better understanding will be presenting within the following theme.
Theme 2: Simulation Design Characteristics

The theme ‘simulation design characteristics’ explores the features and characteristics considered to be necessary to promote the likelihood of a positive student learning experience. Design characteristics that have been reported by researchers include objective setting, fidelity, debriefing (Jeffries, 2007); debriefing, reflection, self-evaluation (Dreifuerst, 2009); adequate time and opportunities for repetition (Starkweather and Kardong-Edgren, 2008); quality of feedback and well prepared staff (Sando et al., 2011).

It would appear that the design characteristics are aligned to the method of managing a simulation event, i.e. the structured educational techniques that are utilised within the learning encounter to provide the planned exposure and experience for the student (Levett-Jones et al., 2011; Arthur et al., 2013; Kable et al., 2013). Furthermore, the design characteristics seek to guide the student through the simulation event, to gain insight into the practical application of their developing skills, and provide progression to achieve the management of increasingly complex situations in various contexts (Lasater, 2007; Scherer et al., 2007). Thus, the choice and implementation of the design characteristics would appear to impact upon the quality of the learning experience.

The level of inclusion and application would depend upon the intended outcomes of the simulation, in this sense, emphasising that the learning outcomes drive the planning, design characteristics and subsequent delivery of the simulation experience (Smith and Roehrs, 2009; Berragan, 2011). In the investigative study by Wilson and Klein (2012), the validity of the framework of Jeffries and Rogers (2007) was challenged. A particular finding was minimal guidance was offered for
structuring the guided reflection, with particular regards to structuring the debrief; this lack of direction is not an uncommon finding (Wilson and Klein, 2012; Kable et al., 2013).

Whilst there is some overlap in recognition and identification of the design characteristics there remains some variance. For instance, Arthur et al. (2013) utilising a Delphi study synthesised expert opinion on the pedagogical principles that are indicative of quality in simulation and presented five ‘essential’ design characteristics: uniquely, scenario complexity was identified whilst also supporting four others; clear objectives, fidelity, student support and debriefing. Whilst within this study they acknowledge that debriefing is a critical part of the learning within simulation, they concede that there is little research on the comparative effectiveness of debriefing methods however, they report that during this phase that the scenario is unravelled most learning occurs.

Debrief

By far, the most discussed simulation design characteristic is that of the debrief (Chronister and Brown, 2012). Whilst recognising that all design characteristics are important, within this review the debriefing will be considered in greater detail. Suggested indicators of high-quality debriefing are that it should occur immediately after the simulation (Issenberg et al., 2005; Bland et al., 2011) and should involve reflective thinking (Dreifuerst, 2009), and specific guided feedback (Lasater, 2007; Levett-Jones, 2011) where it is important to raise mistakes in a positive and constructive way (Leigh, 2008).

The debrief process requires improved reflective skills in order to facilitate development of clinical judgment (Lasater, 2007); furthermore, the quality of the
student reflection has been recognised for its learning value and identified as key to even greater learning (Chronister and Brown, 2012). Lasater (2007) gives an example whereby a participant identified that she “...was not conscious of my thinking during the ‘doing’ until the debriefing...” Indeed, Wilson and Klein (2012) recap that debriefing allows both students and academics to review what happened during the simulation and reflect on the meaning of the event. This corroborates the work of Mezirow (2000), who identified that critical reflection engages learners in reassessing the way that they have posed problems, importantly, as well as the way they have solved them. Another student example given within this study stated that the debriefing gave her “…a chance to verbalise my thought processes so it was more concrete – ‘I did this because I thought about it in this way’...” This particular participant, according to Lasater (2007), affirmed that active engagement in simulation offered her the opportunity to be both a concrete learner and an observer in a reflective manner. This can be seen to map to the work of Kolb (1984) where reflection and conceptualisation occur following an experience. Significantly the culmination of preparedness for a re-encounter can occur.

Dreifuerst (2009) offers that, although debriefing is an essential element of simulation-based learning, it remains a poorly understood learning strategy; Wilson and Klein (2012) concur with this. Indeed, within much of the literature reviewed relating to the debriefing the majority concluded that it was a crucial aspect of simulation teaching and learning; however, there is little insight offered with regards to a specific process. Some comment on the purpose, with regards to providing emotional support to the learners and helping them achieve the learning objectives through reflection (Flanagan, 2008; Cantrell, 2008; Arafeh et
al., 2010), whilst others comment on the timeliness, in that it is important that it follows immediately from the simulation and there is no time lapse (Berragan, 2011; Arthur et al., 2013). Wilson and Klein (2012) detail how academics have been encouraged to make notes during the simulation in order that they would not need to ‘trust their memory’ within the debrief. Others have detailed video recording with tracking facility (Bambini et al., 2009). However, this demands different skill sets with regards to the interpretation of non-technical skills displayed and technology management.

One study uniquely details how the debriefing process varied depending on the type of simulation session (Kable et al., 2013). When using high-fidelity manikin sessions, the debriefing was reported to be a highly structured process incorporating the use of a clinical reasoning cycle (Levett-Jones, 2013). The debrief also utilised principles drawn from a set of piloted quality indicators (Arthur et al, 2013). As with some of the other studies, debrief occurred immediately following the simulation, and consisted of student reflection and self-evaluation (Berragan, 2011). In contrast, this study reported that for low fidelity simulation, debriefing consisted of an informal conversation (Kable et al., 2013) where the key elements of the simulation event were reiterated, questions were asked, and correct responses emphasised. Despite this variation within the debrief style the results from a satisfaction survey they conducted revealed that 94% of students felt they had sufficient time for debriefing, and that 96% felt that the debriefing session provided adequate opportunity to address their feelings.

Overall the debriefing facilitated reflection and self-evaluation of their own clinical skills, strengths and weaknesses; the authors state that this was significantly
higher for first year students, and lower for mental health students. However, there were no other significant differences between the varied approaches they used within debriefing. This is a somewhat surprising finding, as it seems to imply that there is no difference with student satisfaction whether a highly structured process is used or an informal conversation. It would be difficult to attain high levels of clinical reasoning and professional insight from such a short informal conversation reported here (Jeffries and Rozzolo, 2006; Jeffries, 2007; Ricketts, 2011).

What is apparent is that debriefing has been overwhelmingly cited as a key aspect of simulation and vital to student learning (Dreifuerst, 2009; Ricketts, 2011; Wilson and Klein, 2012; Kable et al., 2013). With the exception of the satisfaction survey undertaken by Kable et al., (2013) the overall quality of the debriefing process, from the student perspective, remains largely unexplored. Whilst Kable et al. (2013) have developed a set of quality indicators specifically for the debrief, and the initial results are promising, they have only been tested within the researchers’ own organisation in Australia. However, they do present as an exciting way forward, and could be subject to evaluation within the United Kingdom (UK) nurse education setting, potentially making a significant contribution to the growing body of knowledge relating to the debrief.

In concluding the theme of design characteristics, it has been acknowledged that there are several, often differing characteristics to be considered within a simulation experience (Jeffries and Rozzolo, 2006; Jeffries, 2007; Dreifuerst, 2009; Ricketts, 2011; Wilson and Klein, 2012; Kable et al., 2013). Whilst the structure and process of the debrief do not have a shared framework (Dreifuerst,
2009; Smith and Roehrs, 2009; Wilson and Klein, 2012) it is the debriefing itself that features highly, and thought to have much significance to learning from simulation and is consistently reported as the key design characteristic (Drei fuerst, 2009) and whilst the structure and process of the framework for debriefing has not been identified, essential components appear to exist.

In drawing together the essential components of the debrief, the focus of this literature review turns to the academics who have the responsibility to facilitate the whole simulation process (Berragan, 2011; Ricketts, 2011). The embedding of the design characteristics is one step towards ensuring a dynamic experiential learning environment (Levett-Jones et al., 2011), an exploration of the factors that contribute to the success of the simulation encounter will be considered in detail within the next theme facilitation within simulation.

**Theme 3: Facilitation within Simulation**

The theme ‘facilitation within simulation’ refers to the educational techniques that are utilised by the academic within the simulation encounter to facilitate the exposure and opportunities for the student and learning group. It is the way that the academic seeks to guide the students to apply and assimilate their developing skills through facilitation to the management of more complex situations (Benner, 1984). This theme relates to those activities that occur before, during and after the actual running of a clinical scenario. Often, simulation is used to replicate some of the clinical scenarios that are infrequent or inappropriate for a novice student to deal with in a ‘real’ clinical setting (WMSHA, 2009) thus making it an ideal learning tool. In the studies by Lasater (2007) and Scherer et al. (2007),
critical, life-threatening events were typical scenarios that were played out within simulation and these replicated clinical practice situations.

The literature reports that for simulation to be successful students need to engage in the learning activity, interacting and experiencing it first hand (Bland et al., 2011); the main emphasis within simulations is the acquisition of practical techniques, as such it is considered essential that facilitation promotes students’ abilities to cope with real-life situations (Starkweather and Kardong-Edgren, 2008). Whilst simulations imitate they do not duplicate reality in every aspect, thus much of the literature asserts that simulation can only give the academic a sense of the effectiveness of the students practice ability (Berragan, 2011). Importantly, it has been reported that it enables students to face consequences (Bland et al., 2011), encourages an increase in knowledge, empathy, critical thinking and decision-making (Jeffries and Rizzolo, 2006; Bland et al., 2011) whilst working in a risk-free setting (Wilson and Klein, 2012). Theses values and behaviours are core to developing the nursing profession (NMC, 2010a and b).

What appears to be important in facilitating simulation events is the academic’s ability to adapt to the role of facilitator and move away from traditional teaching methods (Starkweather and Kardong-Edgren, 2008; Kable et al., 2013). Indeed, it has long been recognised that the apprentice principle of ‘see one, do one and teach one’ is no longer acceptable within nurse education and more meaningful engagement has to be strived for (Leigh, 2008). Within simulation the emphasis turns away from the academic as an instructor and delivering content, and towards the learner taking more ownership in the achievement of the learning outcomes (Kable et al., 2011) hence, learner-centeredness. This change in
traditional role implies that as a facilitator, the academic needs to display a different set of skills (Davis and Forrest, 2008), particularly with regards to the way support is offered to the student prior to, during and following the simulation event (Levett-Jones, 2011; Wilson and Klein, 2012). This in itself can be a challenge to those new to simulation teaching (Fountain and Alfred, 2009), where academics may have undertaking their teacher training prior to the growth of technology within learning and teaching (DoH, 2011). Indeed, there is a risk that the equipment and facilities can monopolize the simulation and detract from the learning (Forrest et al., 2013).

Learner-centeredness requires student support through providing clear learning outcomes driven by a focused, relevant scenario – pre-event (Arthur et al., 2013) – cues during the simulation event (Jeffries and Rizzolo, 2006), as well as facilitation of guided reflection on decision-making during debriefing – post-event (Jeffries, 2007; Kable et al., 2013). The provision of cues appears to have much significance during the simulation; studies suggest that the student should be offered information that promotes continuation with the simulation (Starkweather and Kardong-Edgren, 2008; Chronister and Brown, 2012; Arthur et al., 2013) this would promote the flow of the scenario. However, critically, this should not interfere with the students’ independent problem solving and decision-making opportunities (Jeffries, 2007; Smith and Roehrs, 2009); as such, the scenario given should be facilitated in a way that enables the conclusion to be at a suitable clinical end point (Berragan, 2011).
Role and Responsibilities of the Academic

The challenge and responsibility for facilitating such an environment remains with the academic (Leigh, 2008). The academic has the responsibility through an interactive process to develop a sense of social constructivism, where the team work together to construct knowledge and share their perspectives, as in collaborative elaboration (Vygotsky, 1978; Loyens et al., 2009). Indeed, most social constructivist models, such as that proposed by Duffy and Jonassen (1992), stress the need for collaboration among learners. One Vygotskian notion that has significant implications for peer collaboration is that of the zone of proximal development (Vygotsky, 1978).

It is claimed that through a process of deliberate 'scaffolding' a learner can be supported to extend their expertise, through and, beyond their current limitations to a point of higher achievement and accomplishment (Vygotsky 1978), a notion that has strong fit with the pedagogical underpinning of simulation. Indeed, the studies from Arthur et al. (2013) and Kable et al. (2013) specifically describe the scaffolding of learning experiences throughout the curriculum. Arthur et al. (2013) elaborate on the term and suggest that;

“Scaffolding refers to the provision of adequate support to promote learning. It implies purposefully constructed activities that build towards student mastery, with gradual reduction in staff involvement” (Arthur et al., 2013, p3).

This is a vision shared within several other studies (Starkweather and Kardong-Edgren, 2008; Leigh, 2008; Bambini et al., 2009; Biggs and Tang, 2011) that align to the acquisition of professional standards of practice (Benner, 1984; NMC 2010b). Thus, the role of the academic is to adopt different styles of interaction with learners according to the purpose of the educational interaction, the
relationship and nature of the session could be seen to have a wide spectrum of application (Forrest et al., 2013).

It has been voiced that academics leading simulation could be under-prepared for its implementation and application (Starkweather and Kardong-Edgren, 2008) with consequences to the quality of the learning experience and student satisfaction (Kable et al., 2013). Bambini et al. (2009) assert that the academics in their study embraced the challenge by attending conference presentations and engaging in self-directed learning. However, putting the challenge first, would appear to suggest that the academic was playing ‘catch-up’ with the implementation; it has been claimed that could impact negatively upon the effectiveness of the academic to facilitate adequately (Levett-Jones, 2011). In contrast to this, the academics in the study by Starkweather and Kardong-Edgren (2008) attended a two-day residential before simulation was introduced, thus ensuring preparedness for the new methodology (Arthur et al., 2013) and this was reported as a successful approach.

It was notable that in some of the studies – particularly where the use of simulation did not evaluate well – there is no evidence presented as to how, if indeed at all, the academics were prepared for their role as facilitator within a learner-centered approach (Radhakrishnan et al., 2007; Scherer et al., 2008). Notably these were in some of the earlier studies; within the more recent literature, training for academics appears to be higher on the agenda (Smith and Roehrs, 2009; Arthur, et al., 2013; Kable et al., 2013). Where preparation was undertaken prior to the introduction of simulation, the researchers reported overwhelming student satisfaction with their simulation experiences and a steady
increase in the usage of simulation by academics, increasing from 20% of students exposed to simulation to over 50% exposed (Starkweather and Kardong-Edgren, 2008). This may be an impressive increase, but adds to perceived concerns about wide-scale roll out and associated questions regarding the cost-effectiveness (Berragan, 2011; Bland et al., 2011).

Whilst academic skill and expertise within simulation is mentioned in the majority of the more recent studies (Bland et al., 2011; Arthur et al., 2013; Wilson and Klein, 2012; Kable et al., 2013), overall there is very little evidence that can be summised as to what constitutes ideal preparation for the responsibilities and role of the academic as a facilitator. More recently, quality indicator statements regarding effectiveness have emerged (Kable et al, 2013), and design characteristics to develop flow (Smith and Roehrs, 2009; Arthur et al., 2013), but best practice guidelines or research studies evaluating preparation for the role remain sparse. In reality, simulation is a powerful learning tool, one where the academic is expected to adapt the learning experience, often ‘in mid-air’ by using his or her own initiative, intuition and facilitative skills in order to steer the learning experience to where the learners want to create value (Berragan, 2011), this is a situation where students report greatest satisfaction, that which lies at the heart of the teaching-learning encounter (Smith and Roehrs, 2009; Kable et al., 2013). Having determined that academic training is essential to promote the likelihood of effective facilitation taking place, questions have been raised as to how this can be achieved in an academic preparation framework (Starkweather and Kardong-Edgren, 2008; Nehring and Lashley, 2010).
In concluding the theme of facilitation within simulation, it has been revealed that the academic holds the most significant role within successful facilitation covering a spectrum of applications of simulation (Berragan, 2011). However, little evidence exists as to what constitutes reasonable preparation in order to promote effectiveness and accomplishment of the learning outcomes (Starkweather and Kardong-Edgren, 2008; Bambini et al., 2009).

One element that appears to convince many of the usefulness of simulation is the over-whelming reports of its success in preparing students for clinical practice (Berragan, 2011; Ashley et al., 2013), so much so that it can be utilised as actual clinical hours within nurse education (NMC, 2007a; NMC, 2010b). Within the final theme, of the literature review, the notion of enhancing preparation for clinical practice will be explored within the theme ‘transference to the reality of nursing practice’.

**Theme 4: Transference to the reality of nursing practice**

The theme ‘transference to the reality of nursing practice’ refers to the evidence that students have developed enhanced confidence and competence to work within clinical areas of practice. So far, the evidence for the effectiveness of simulation, in promoting transference, remains relatively weak (Jeffries and Rizzolo, 2007; Scherer et al., 2007) and in many cases relates to pilot studies (Radhakrishnan et al., 2007; Levett-Jones, et al., 2011; Arthur, et al., 2013; Kable, et al., 2013) or small case studies (Scherer et al., 2007; Starkweather and Kardong-Edgren, 2008). The literature suggests that simulation increases skills acquisition (Parker and Myrick, 2009), learning to be a nurse (Berragan, 2011),
and professional confidence and competence (Smith and Roehrs, 2009; NMC, 2010a). However, whilst these positive outcomes have been suggested, evaluation of the effectiveness actually relates to the achievement of the given educational learning outcomes for the simulation session and not whether what has been learned, in terms of an actual scenario, has been used within [or transferred to] the practice setting (Jeffries, 2007; Wilson and Klein, 2012; Arthur et al., 2013; Kable et al., 2013).

Leigh (2008) has stated that professional confidence is formed by nursing students’ acquiring knowledge, theory and the ability to think critically. Thence, students must apply what they have learned to clinical situations and this is where the current evidence is lacking. Self-reflection and exploring alternatives have also been described as important components of developing self-confidence (Smith and Roehrs, 2009; Levett-Jones et al., 2011). However, there remains a paucity of evidence and attention given to whether simulation teaching has the capacity to translate into the reality of dealing with the complexities and realities of clinical nursing practice. Clinical practice is seen as more than just clinical techniques and one criticism of simulated learning is that it may only reproduce procedural training (Kneebone et al., 2004), in stark contrast to what is aimed at being achieved within professional confidence; the ability to deal with complex patient cases, which cannot always be rehearsed for (Leigh, 2008; Wilson and Klein, 2012; Arthur et al., 2013; Kable et al, 2013).

Within the growth of simulation it has been recognised that the learning cannot replace clinical experience, despite there being an increased use of simulated hours within education (NMC, 2007; NMC, 2013), some remain critical of this
adoption. Indeed, Berragan (2011) questions whether there is actually the potential that simulation may take over from or replace reality at all, raising this as a real concern in its uncritical adoption. She argues that it is as a result of the day-to-day interaction with patients that nurses learn to construct their own professional identities.

Furthermore, the social element of the nurse’s role links well with theories of learning which highlight social participation in communities of practice, where historical and cultural context is considered to be important (Lave and Wenger, 1991). Within Chatterjee’s (2004) research, some students were sceptical; with one reportedly stating that ‘when faced with a real patient there is no resemblance to practice in a skills laboratory’ (p13). Indeed, there has been some criticism that clinical skills centres purely offer a substitute to relieve staffing pressures in clinical placements and the shortage of placement opportunities (Bambini et al., 2009).

Comparing simulation with other educational modalities, the study undertaken by Scherer et al (2007) sought to determine the most effective method for increasing nurse students’ knowledge and confidence, comparing simulation with a clinical seminar. Within the results presented they stated that there were no significant differences between the pre- and post-test knowledge scores for either the experimental (simulation) or control group (clinical seminar). Furthermore, the researchers state that the improvement in post-test knowledge scores was an expected outcome. Both groups’ knowledge scores improved, although not significantly, and some knowledge was lost over time (importantly no significance data was presented for further interpretation).
Loosing knowledge over time is not a unique finding – particularly with regards to the short-term gain - following an educational intervention (Bullock et al., 2008). Within their results, significance is reported for the control group for each confidence score. The researchers suggest that this could be due to the students in the control group not needing to demonstrate actual hands-on skills, which was the case for the students in the simulation group. However, one would expect hands-on care would more likely enhance the likelihood of transferability. In examining this study further what emerges is the seminar was utilised as a teaching session, whereas the simulation was used as an assessment session. As such, an unfair comparison has been made, which has actually favoured the seminar group (Polit and Beck, 2014). Indeed, assessment conducted in this way (i.e. unfamiliar approach – and as part of a research study) would inevitably lead to some stress and anxiety within the group, and certainly could lead to a lack of confidence within the simulation group, as was reported in this case.

**Factors that enhance Transferability**

In establishing which factors are likely to impact upon the enhancement of transference, Ricketts (2011) makes suggestions that any transfer of learning to the real clinical setting is determined by the authenticity of the simulated experience. However, such authentic replication cannot always be achieved and should not be aimed for at the expense of the development of student confidence and competence (Hamstra et al., 2014). Such intense learning may be lost if resources are spent on advanced simulation technologies that do not put the student at the centre of the learning experience (Berragan, 2011) but rather focuses upon expensive realistic simulation aids.
Campbell and Daley (2013) share this notion of authenticity, attributing transference to psychological fidelity, which is the degree to which the student perceives the simulation to be a believable representation of the reality it is attempting to duplicate. As such, the simulation, context and scenario must all be authentic (Bland et al., 2011). To enhance transferability, the student must take on the role of the ‘nurse’ and feel the responsibility for the care to meet the needs of this ‘real’ patient, best based upon a realistic clinical scenario (Roberts and Green, 2011). This feeling of responsibility enhances the likelihood of translation to practice by tapping into the emotional or psychological component of the students; emotional learning in this way has been demonstrated to improve memory and allow for better retrieving (Bland et al., 2011; Campbell and Daley (2013).

Whilst some studies have suggested that simulation enhances self-confidence of nursing students in caring for patients and preparing students for clinical practice, these studies do not identify the factors that lead to these outcomes. In each case reproducibility in practice is difficult to establish (Jeffries and Rozzolo, 2006; Scherer et al., 2007; Leigh, 2008). Smith and Roehrs (2009) undertook a descriptive, correlational study to examine the effects of simulation experiences on two outcomes: student satisfaction and self-confidence. They found no strong correlations between any of the design characteristics and these outcomes. They went on to carry out a multiple linear regression analysis to determine if any combination of factors might better explain the variability in these outcomes than any design characteristic alone. In terms of self-confidence, over 45% of variance was explained by the five design characteristics combined (Jeffries, 2007). An additional analysis revealed that problem solving alone contributed to almost 34
% of variance in self-confidence. Concluding that nurse academics must carefully consider the design of simulation experience, perhaps using a template based on the design characteristics; this is further supported within the work of Arthur et al. (2013) and Kable et al. (2013) to support and develop the incidence of transferability.

An investigative study undertaken by Bambini et al. (2009) considered the usefulness of simulation to improve student self-efficacy in clinical skills as preparation for clinical experiences with real patients. Their analysis indicated that clinical simulation experiences could be effective in increasing students’ self-efficacy in providing care for their patients. Self-efficacy is defined as one's belief in one's ability to succeed in specific situations (Bandura, 2004).

In relating this definition to simulation, Bambini et al. (2009) propose that the enhanced feelings of self-efficacy translate into practice by affecting nursing care behaviours and confidence; in supporting simulation in preparedness for clinical practice they consider it also as a catalyst for the development of self-efficacy. Simulation provides a safe environment where students can practice skills, and where errors in clinical judgment will not result in harm to real patients (Bland et al., 2011; DH, 2011).

It is reported within several papers, that clinical simulations may provide a bridge between theory and practice as nursing students learn to provide safe care within the constraints of their inexperience (Leigh, 2008; Fountain and Alfred, 2009; Smith and Roehrs, 2009; Nehring and Lashley, 2010). Bland et al. (2011) go further to state that simulation should not be limited to the bridge between delivery of theory and practice, but rather used as a catalyst, in that it is an approach that
enables theory to be integrated with practice allowing the academic to deliver and articulate theory in conjunction with the delivery of care often spontaneously in response to student direction. To integrate such complex learning activities successfully the simulation experience can be structured to offer repetition, thereby consolidating learning and develop competence key factors for ensuring that confidence is gained and transferability becomes more likely (Issenberg et al., 2005; Levett-Jones et al., 2011). Further potential transferable skills include increased abilities within communication, confidence, competence, and clinical judgment, which are all core components of nursing education (NMC, 2010b; Levett-Jones et al., 2011; Arthur et al., 2013).

In concluding the theme of transference to the reality of nursing practice, it has been acknowledged that there is a paucity of research that definitively outlines the transference of skills gained to the realities of clinical practice. However, it is hard to detach from the compelling reports of safety, authenticity and enhanced confidence as strengths in preparing students for the clinical setting (Leigh, 2008; Bambini et al., 2009; Fountain and Alfred, 2009; Berragan, 2011). In the absence of concluding evidence, perhaps it is these factors that serve as the drivers for increased uptake and utilisation within nurse education settings for simulation as a method of content delivery (Wilson and Klein, 2012). Caution is expressed within the work of Berragan (2011) with regards to the disparity between educational resources, concluding that not all simulation experiences are equally effective. Notably, there are concerns regarding the costs associated with the development of a simulation environment to ensure equity of opportunities for all students and a standardised approach within an area where evidence base is limited (Ricketts, 2011); furthermore, structured academic education is considered
paramount for realising successful transference (Starkweather and Kardong-Edgren, 2008).

IV. Conclusion

The purpose of this literature review was to explore and describe how simulation is being integrated, delivered and facilitated whilst also considering how it can improve clinical practice. Within the studies reviewed the researchers present many narratives and descriptions of the significant characteristics that lead to positive outcomes (effectiveness) of utilising simulation within nurse education (NMC, 2010b; Levett-Jones et al., 2011; Arthur et al., 2013). There were many examples of rich and meaningful evaluative statements regarding the quality of the learning encounter and enhanced confidence, competence and clinical decision-making (Leigh, 2008; Bambini et al., 2009; Fountain and Alfred, 2009; Berragan, 2011). Whilst no formal studies exist to support these reported attributes, within the studies students were able to articulate the benefits simulation has had for them (Kable et al., 2013). Further research as to how best to prepare students for their clinical practice, would ensure that students are offered quality simulated learning opportunities that are flexible and responsive to both their educational needs and the demands of the healthcare service (Bland et al., 2011; Hope et al., 2011).

Whilst simulation has been reported to be valuable within nurse education, it remains a very expensive aspect of content delivery, with many fundamental requirements needed to heighten the likelihood of ‘successes’ (Ricketts, 2011). A qualitative integrative thematic analysis was used to systematically identify the
main, recurrent and most important themes and concepts within simulation pedagogy (Creswell, 2007). Four themes were consistently evident throughout the thematic analysis of the literature review. These were synthesised to address the review questions and have driven forward the enquiry phase of the thesis. For instance, within the theme curriculum integration, some approaches to applying simulation within the nursing curriculum were detailed and explored, whilst it was considered important to some, to determine clarity surrounding suitable curricular frameworks (Giddens and Brady, 2007; Starkweather and Kardong-Edgren, 2008; Parker and Myrick, 2009), there was no commonality regarding structure and approach that could best prepare for simulation experiences within the literature.

Within the theme design characteristics, the factors that influence the academics’ individual approach to the implementation of simulation were explored and detailed. Authors reported several design characteristics that need to be considered to offer structure and guidance to the actual process of simulation – which include before, during and after the scenario (Dreifuerst, 2009; Smith and Roehrs, 2009; Wilson and Klein, 2012). However, there were gaps within the literature regarding the elements of importance within the simulation design that would aid the learning process. The debrief was considered to be essential to learning through simulation (Chronister, 2012; Kable et al., 2013). Whilst this was evidenced within descriptive studies, clarity and commonality as to a shared vision for best practice as to how to conduct the debrief to enhance student learning was a gap.
Facilitation within simulation aspects of differing approaches within the simulation experience and their impact upon the student's experience were considered. The theme explored the fundamental question regarding how academics should be prepared to work within simulation. The evidence that simulation equipment has arrived before teaching staff have received any formal training and education, as to how it will be utilised, was discussed as a limitation to good practice and preparedness (Starkweather and Kardong-Edgren, 2008; Bambini et al., 2009). The principles of preparation or support of the simulation facilitator or faculty and influence on simulation remains unexplored, particularly in relation to enhancing student learning and engagement.

Within the final theme, it emerged that one of the biggest unexplored aspects within simulation is its ability to transfer to the reality of contemporary nursing practice to bring about positive patient outcomes. Whilst some studies support student self-reporting of ‘success’ within the encounter, this appeared to be within the actual teaching practice itself and not clinical practice, possibly explaining some of the academic’s reluctance to embrace simulation (Leigh, 2008; Bambini et al., 2009). Within the literature there was a general appeal for greater empirical evidence of transference to convince academics that this does actually exist (Fountain and Alfred, 2009; Berragan, 2011). One principal that appears to be universally accepted within the literature is that simulation offers permission to fail, a very unique notion; there is no threat to the student engaged within simulation where potential harm to a patient could occur. Reduction of error is seen to be a top priority within the health care agenda (Kardong-Edgren et al., 2011; Levett-Jones et al., 2011) and students report that they gain confidence whilst undertaking repeated practices (Lapkin et al., 2010; Levett-Jones et al., 2011).
In pulling together the key themes from the literature review it became apparent that there is a moderate amount of anecdotal and evidence-based literature on the topic of simulation within nurse education, however, gaps still exist in relation to a shared understanding as to the characteristics that make simulation effective and the educational principles that could guide its implementation. Furthermore, gaps still exist in what is known about the longer term outcomes of simulation.

In moving forwards within this thesis questions were generated to explicate and describe these through a case study method. One of the strengths of case study research is that it is context-specific but has scope for resonance across other arenas (Simons, 2009). It offers time for reflection within practice and analysis based upon the findings from a group who can determine applicability to their own situation, deemed important within a professional doctorate (Eraut, 2007).

**Research Aim and Questions**

Research Aim:
To explore and describe the characteristics that make simulation effective within nurse education.

The following questions will be the focus of the research:

- *What approaches to integrating simulation within the nursing curriculum do academics use?*
- *What factors influence an academic’s approach to the utilisation of simulation within their teaching?*
In what ways do different approaches within simulation affect the student’s experience in terms of their learning, involvement and engagement within the learning process?

What evidence exists of the support for transference of learning from simulation into clinical practice?

Given that healthcare education and practice are complex, case study research offers researchers the opportunity to explore the issues from various perspectives (Thomas, 2011). Accordingly this approach was considered appropriate as the researcher aimed to discover the ‘emic’ perspective, that is, the insiders’ point of view (Holloway and Wheeler, 2002). Furthermore, using this approach would facilitate the collection of rich, detailed and reflexive data (Bryman, 2008) from a specific case study group, whilst providing the opportunity to achieve the research aim and explore the research questions. The following chapter details the method of the research design with the aim to explicate these characteristics.
CHAPTER 3

DESIGN AND METHODOLOGY

The aim, research questions and design decisions for this study have evolved over several years, drawn from the synthesis of the literature presented, and were shaped continually through working within the professional practice area of education – specifically, simulation for many years and throughout the professional doctorate journey (Eraut, 2007; Alvesson and Skoldberg, 2010). This qualitative study used a naturalistic inquiry approach, which was guided by the research questions. Accordingly, the case-study research approach was considered appropriate as the case within this study was clearly identifiable with boundaries, and was considered to be a process where practitioner-researchers gain insight by reflecting on the details and descriptions presented within case studies (Mills et al. (2010).

I. Research Design

Characteristics of Qualitative Case-Study Research

Case-study research is often described as the collection and presentation of detailed, unstructured data obtained from various sources to better understand particular groups, individuals, societies or organisations (Bryman, 2008; Yin, 2009). Analysis within case-study research allows researchers to study contextual detail and to provide rich, deep descriptions of findings. Typically, explanations of phenomena emerge from the study as data sources are analysed (Yin, 2009).
Within this study, the researcher wanted to explicate the characteristics that make simulation effective within nurse education. Based on this the students and academics undertaking simulation activities were the case to be studied. Having gained an enhanced understanding of the gaps and factors influencing the effectiveness from the literature review an exploratory case-study, which answers the ‘what…?’ questions posed for the research was considered the most appropriate approach (Denzin and Lincoln, 2008).

In case-study research the researcher would normally collect data from more than one source (Yin, 2009), within this study data has been collected from focus groups and some field observations were made from the video footage. Whilst this is arguably, not an extensive use of multiple data sources, the issues have been explored from various perspectives, those of the academics and those of the students engaged within simulation activities. This does present some participant triangulation but might be considered to be a limitation to the approach taken within this research; however, the key strengths in fitting within an overall case-study framework are evidenced. These include the study being situated in the real-life setting, suited to nurse education where phenomena are complex and based in realities, is contextual with thick descriptions being provided enabling others to make judgements about the relevance of these findings to their own situations (Yin, 2009, Simons, 2009; Thomas, 2011). It is these characteristics provide a firm boundary to the case whilst facilitating multiple perspectives that underline this approach and enables the investigation of complexity.

Similarities in case-study details and descriptions that resonate can provide a strong evidence base for future educational practice (Goding and Edwards, 2002;
Eraut, 2007). What constitutes good teaching and specifically, within this study, effective simulation is still very much open to debate and depends on the particular circumstances (Sugrue and Day, 2002) and the interpretations of both the researcher and participants (Creswell, 2007). Fundamentally and from an epistemological position, realities perceived within the case are considered to be multiple, constructed and holistic, and the researcher and participants are interactive and inseparable (Denzin and Lincoln, 2005; Lincoln and Guba, 2008). With this in mind, the research design and methods presented offer a rigorous approach to data collection, data analysis, and report writing (Creswell, 2007).

In qualitative case-study research participants need to be accessible, willing, and distinctive for their accomplishments and ordinariness, that can shed light on the phenomenon being explored – experiences within simulation (Plummer, 1991). The initial target population was Higher Educational Institutions (HEIs), which have an established tradition of simulation within the nursing curriculum, whether or not this was being embedded to fully or partially meet the 300 hours of the possible 2,300 practice based hours for direct care (NMC, 2007a). Of the seven local (UK Midlands) HEIs, three were approached as case studies for this research. The actual site chosen was one where established professional links had previously been made: in this case the researcher, and visa versa knew the HEI; this was considered a strength, as access and rapport already existed (Reed, 2000; Bogdan and Biklen, 2003). However in order to afford a rich, in-depth case study approach, with as much credibility as possible, the researcher was not known to the actual case-study participants, i.e. the students and academic team involved within the simulation (Bryman, 2008).
The focus of qualitative case-study research needs to be upon understanding the phenomenon being explored rather than solely upon the reader, the researcher, or the participants being studied (Creswell, 2007). Indeed, the inherent process within qualitative methodology is both inductive and interpretive, in that the researcher builds abstractions, concepts, hypotheses and theories (Denzin and Lincoln, 2008) from data collected in collaboration with applying a self-reflective approach of how the research was conducted, read and advanced (Cutliffe and McKenna, 2000; Alvesson and Skoldberg, 2010). Important within this is the integration of one-self at the core of the inquiry (Creswell, 2007). Denzin and Lincoln (2005) strongly emphasise the researcher’s presence and interpretive work within this approach:

“Qualitative research is a situated activity that locates the observer in the world. It consists of a set of interpretive, material practices that make the world visible. These practices transform the world. They turn the world into a series of representations, including field notes, interviews, conversations, photographs, recordings, and memos to the self. At this level, qualitative research involves an interpretive, naturalistic approach to the world. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them.” (Denzin and Lincoln, 2005, p3).

In further work they describe the existence of interconnected, generic activities that define the qualitative research process (Denzin and Lincoln, 2008); these go by a variety of different labels, including theory, analysis, ontology, epistemology and methodology. Behind these terms stands the personal biography of the researcher, who speaks from a particular class, gender, racial, cultural, and ethnic community perspective (Creswell, 2007). The gendered, multi-culturally situated researcher approaches the world with a set of ideas – a framework (theory, ontology) – that specify a set of questions (epistemology) that the researcher then
examines in specific ways \( \textit{methodology, analysis} \) (Polit and Beck, 2014). Therefore, every researcher speaks from within a distinct community that configures the multicultural, gendered components of the research process (Denzin and Lincoln, 2008). Whilst this could be considered a limitation to the research process, the utilisation of fieldwork within qualitative research enables exploration not only of what occurred but also of the processes and meanings of events for the participants (Hammersley and Atkinson, 1995; Denzin and Lincoln, 2005). Furthermore, the notion of ‘holism’ is integral to the fieldwork (Guba and Lincoln, 2008), and is achieved through data collection occurring first-hand within the learners and academics usual simulation setting (Polit and Beck, 2014).

It has been stated that academic-practitioner research, such as this, is inextricably linked with professional development; indeed, it has been suggested that professional practice both generates and uses evidence (Thomas and Pring, 2006; Eraut, 2007). There is also a growing trend of educational research being more concerned with emphasising ‘research-in-education’ as opposed to ‘research-on-education’ (Elliott, 2006; Arthur et al., 2012). This holds significance within this study as the research is not only set within the educational setting, but also an integral part of the learning process for the students.

There are many varied definitions of educational research, and according to Elliott (2006) educational research is an eclectic, democratic and coherent form of common-sense inquiry into educational matters from which practical insights and judgements about educational practice may be formed. As such, it complements research-on-education, which views the investigative process in more scientific terms and aspires to produce objective knowledge (Creswell, 2007; Arthur et al.,
Elliott (2006) further states that the significance of these practical insights will depend on the quality of the situational understanding that underpins them, and that this in turn is enhanced through rational scrutiny (Brockbank and McGill, 2000).

I. Ethical Considerations

Regardless of the approach to qualitative inquiry, ethical issues may surface during data collection in the field and in analysis and dissemination of qualitative reports (Polit and Beck, 2014). Ethical approval was sought and granted by the Educational Institution where the researcher was working (appendix 4). Access was required to members of academic staff and student nurses within a HEI, so approval for the study was sought and granted from the relevant Head of Department. Thomas and Pring (2006) identify that the rights of any individual involved in a research study are: confidentiality, anonymity, voluntary participation, informed consent, not to be harmed, dignity and self-respect; each person was respected as an individual and encouraged to make their own decision regarding involvement (British Educational Research Association (BERA), 2011). Several measures were employed to ensure confidentiality, and anonymity was maintained. The anonymity of the participants was achieved through assigning each one a coded number during the transcribing process. Case studies of individuals that represent the composite picture were developed, rather than any individual pictures (Hammersley and Atkinson, 1995).

To gain support from the participants, the researcher conveyed the purpose of the study. Furthermore, participants were made aware, verbally and in writing, of the
intention of the wider vision to embellish a growing pedagogy of simulation practice and the expected routes of dissemination of the findings. All participants signed a consent form indicating their willingness to participate. Hennink et al. (2011) emphasise the need for truly informed consent from the participants, in that it gains commitment and makes it more likely that their experiences would be complete. The participants were informed of their rights: they could withdraw at any time from the study and that they could have access to the data analysis. The themes developed needed to resonate strongly with what the participants understood to be the key characteristics that make simulation effective (Creswell, 2007). It was therefore considered important within the validation of the results to return to the participants, with the early findings following preliminary data analysis, for confirmation of interpretation (Denzin and Lincoln, 2008; Hennink et al., 2011).

II. Research Methods

Data Collection

Data collection is a collection of interrelated activities aimed at gathering good information to answer the research questions, which Creswell (2007) identifies as a cycle, the inherent stages described by Creswell form the basis of the structure for this section (Figure 3.2).

Access and Rapport

Formal access to the HEI, in order that the relevant data could be collected, was gained through the ethical approval process (Denzin and Lincoln, 2008), with the
specific ‘gatekeepers’ receiving additional information regarding the study, as suggested by Bogdan and Biklen (2003). The potential participants were given an introductory information sheet, which clearly detailed that participation was voluntary and that they could withdraw at any time. It also stated the central purpose of the study, the data collection procedures, and the time expectation. A separate consent form outlined potential benefits and risks to participation and comments regarding protecting confidentiality of the respondents and the potential use of quotes (appendix 5 and 6). To increase openness and rapport, the participants were also appraised of the researcher’s motivation for their selection as part of a purposeful sampling strategy (Creswell, 2007).

**Purposeful Sampling Strategy**

The concept of purposeful sampling is used within qualitative research (Denzin and Lincoln, 2008) and in particular within the case study approach. It is accepted that the inquirer selects individuals and sites for study because they can purposefully inform an understanding of the research problem and central phenomenon in the study and the boundaries within the case (Creswell, 2007). Several qualitative sampling strategies exist; the typology within this inquiry followed that of a convenience group (Denzin and Lincoln, 2008). This approach was selected, as it is cost-effective both in terms of money and effort; the students were undertaking simulation activities within a module of formal study during the two-week period that the researcher had access within the HEI (Miles et al., 2013) thus being bound by place, time and context (Yin, 2009). Convenience sampling comes at the expense of information from one unit and that of credibility (Silverman, 2006) as such, the findings may not reflect the experiences elsewhere. However, the intent of this research was not to generalise the
information but to elucidate the particular and the specific (Pinnegar and Daynes, 2006) with regards to the effectiveness of simulation within a defined setting.

The size of the population to study is an important decision within the data collection process (Pinnegar and Daynes, 2006). Creswell (2007) details a wide range of suitable sample sizes when utilising qualitative research, ranging from phenomenology from 1 up to 325 to case study in the region of 4 to 5. A ‘within-culture’ sampling or ‘big net approach’ has been described (Fetterman, 1998), where at first the researcher mingle with everyone; they can then rely on their judgment to select members of the subculture based on their research questions. According to Hammersley and Atkinson (1995) the criteria are based on gaining some perspective of the chronological time in the social life of the group and the contexts that lead to different forms of behaviour.

With these factors in mind, the total population size consisted of all the students (convenience and ‘big net approach’, (Fetterman, 1998) undertaking simulation experience during the two-week allocation period (typical case study) (total n=43) who voluntarily gave their consent to participate within the focus group (n=22). There were two student groups from two cohorts of academic study who were following the ‘old’ and ‘new’ version of the curricula; these are referred to as C08 and C12 respectively. Focus groups one and two (FG1 and FG2) were following the curriculum that had been in place since 2008 (C08), whereas focus group three (FG3) was following a newly implemented curriculum from 2012 (C12).

**Forms of Data**

The particular approach to research often directs the qualitative researcher’s attention toward preferred approaches to data collection (Creswell, 2007). The
The main aspect of this inquiry was the data that was collected from focus group interviews; the data collection process detailed within Figure 3.1 situates this additional activity – the focus group participation. It also serves to provide an overview of the range of observations and activities that normally take place within the simulation experience, i.e. observations of simulated practice and debrief with video recording and feedback (Arthur et al., 2013).

Following the observations of the students within simulation, further consent was gained to participate within the focus groups (total n=14 participants). The student focus group sizes were group one (n=7 participants), group two (n=7 participants), a third group were included within the data analysis who were part of the initial pilot group three (n=3 participants). A fourth focus group was made up of the academics involved within simulation and consisted of five participants, which included all of the academics who had been involved in the delivery of the sessions detailed within Figure 3.1. These academic members also regularly participate within the simulation delivery within the HEI within all curricular, important elements within the selection criteria (Thomas and Pring, 2006).
Figure 3.1: The Learning, Teaching and Data Collection Process, data collection occurred only during the bottom phase of the diagram i.e. during the focus groups.

**Recording Procedures**

As a matter of usual practice, simulated experiences are video-recorded within the case study setting, this is typically used for analysis and debrief later. Whilst the researcher observed these activities for all student groups, prior to the focus groups commencing, this was considered to be a strength in assisting the researcher in building an in-depth picture of the general research area (Yin, 2009; Arthur et al., 2013) but did not play a role within the data collection (Creswell, 2007), it did facilitate the contextualisation of the research process with the curriculum schedule. It was following the simulation experience that the student
focus groups were conducted guided by a thematic questioning approach, each lasting approximately 40 minutes. This is where the primary data collection occurred. There was one academic focus group conducted, guided by a similarly structured thematic approach, which lasted approximately one hour. It was ensured that all participants (students and academics) had read the information sheet and signed a valid consent form prior to the focus groups commencing.

During the focus group discussions both video recording and audio recording were utilised. The video recording enabled field observations to be made, for example non-verbal communications, which included expressions, gestures, nods of support to confirm unanimous responses. Also the use of nuances and comments could be contextualised (Polit and Beck, 2014), important field-notes that may otherwise have been lost following the transcribing process (Hennink et al., 2011). Video-capture also ensured that all the participant views were retained and prevented issues with loss-of recall or filtering of data. Voice recording was used to ensure that clarity was gained to ensure accurate transcriptions; video footage alone often does not provide adequate audio (Polit and Beck, 2014).

**Focus Groups**

A focus group is a meeting of a group of participants and the researcher to consider a specific topic; in this case the participants’ experience within simulated practice (Davies et al. 2003). Freeman (2006) highlights that focus groups are a useful tool to explore feelings and experiences of participants, whilst Bowling (2014) offer some useful preparatory suggestions for organising focus group discussions, such as ensuring clarity of the research question and comprehensive methods for re-visiting participant responses. Researching individual perspectives
of the effectiveness of simulation had the potential to be a complex and arduous exercise, where a lone participant may be reluctant to share their standpoint or ‘emic’ perspective (Holloway and Wheeler 2002). The approach within this inquiry incorporated learner and academic perspectives in a dynamic way. As such, group participation was considered to be an integral element within the data collection in the way that it embraces participant inclusion, empowerment, recognition and representation of explicating the characteristics that make simulation effective within nurse education (Creswell, 2007; Denzin and Arthur, 2008; Arthur et al., 2013).

Typically the emphasis is on the collective case, rather than the individual, which serves to foster expression of ideas, encouraging the group members to speak up in an freely open forum and tilting the balance of power towards the group (Denzin and Lincoln, 2008). Within the focus group both the author and a peer-reviewer were present; this facilitated a process of peer review, which was considered to be an enabling process of the inquiry that facilitated sharing of thoughts, understandings and challenges (Lincoln and Guba, 2008).

The focus group method was considered particularly useful in attempting to remain as close as possible to the accounts made by the study participants (Freeman, 2006), and to bring the researcher closer through a direct and intense encounter with the key individuals (Pinnegar and Daynes, 2006). The specific management of the focus groups was aimed at ensuring that all group members had the opportunity to participate, ensuring that a great deal of data was collected in a relatively short period of time (Bryman, 2008); all comments that were made were considered to be of equal value (Bowling, 2014) and were acknowledged
accordingly, whilst ensuring through a peer review mechanism that the re-visiting of participant responses were no longer necessary or appropriate (Guba and Lincoln, 2008).

Participants were asked to explore and describe what makes simulation effective from their perspective through a series of open-ended questions. An anticipated issue that could affect focus groups dialogue is the risk that the discussion could divert to other topics, which were not relevant to the research (Stewart et al., 2007); one method utilised to overcome this risk was to structure the discursive flow using the thematic question protocols detailed above. These served to act as both a prompt and to record information collected during the focus group (Creswell, 2007); an addition that Freeman (2006) consider to be meta-planning. Similarly, this approach encouraged all group members to take part.

The researcher had full access to the information collected, which included the transcribed data, video footage and audio recordings. Data will be kept confidential, and to date:

- The data are stored securely on a password protected computer;
- All data have been transcribed and coded, therefore identity has not been revealed;
- The data are stored in line with the researchers HEI guidelines and will be retained for at least five years;
- Following this period the data will be securely disposed of, in accordance with the researchers HEI guidelines.
The opening questions that were used within the protocol to start the discussion were of fundamental importance (Stewart et al., 2007); these related to the shared experience of the effectiveness of learning through simulated practice (appendix 7 and 8). As far as possible the questions and their order were memorised by the researcher, to minimise losing eye contact with the participants, with appropriate verbal transitions from one question to the next provided by the researcher (Creswell, 2007):

- Can you identify any approaches that were utilised particularly well within this simulation event?
- What is likely to increase your involvement and engagement within the learning process?
- What are the specific elements within simulation that bring it to life for you?

Qualitative researchers can often be overwhelmed by the amount of time needed to collect qualitative data and the richness of the data encountered (Denzin and Lincoln, 2008). A pilot project was undertaken to gain some initial experience (Bowling, 2014), where the data collection was limited to a focus group of three student and two academic participants. This provided rich insight into a realistic estimation for the time needed to collect and transcribe the data (Creswell, 2007). As detailed within the flowchart at Figure 3.1, the data collected from the early pilot of the questions to students (n=3) has been included within the data analysis as no significant changes were made to the question structure or body.
III. Data Analysis

Data analysis in qualitative research consists of preparing and organising the data for analysis, then reducing the data into themes through a process of coding and condensing the codes, and finally representing the data in figures, tables and discussion (Arthur et al., 2013). The essence of communicating the research process effectively to others depends largely upon the researcher’s ability to convey clearly not only intellectual rigour, but also the stages through which information was collected and interpreted (Denzin and Lincoln, 2008). Indeed, it has been claimed that the activity of ‘content analysis’ remains possibly one of the most poorly illustrated techniques in published research papers, and techniques can vary (Miles et al., 2013). In order to make this explicit within this study, the framework for analysis was ‘The Data Analysis Spiral’ as described by Creswell (2007, p150) and is demonstrated in figure 3.2.

Creswell (2007) highlights that analysing qualitative data is often individualised and rarely follows a linear pattern. Instead, the stages of data collection, analysis and report writing are merged, with the researcher moving from one stage to another and then back again. Similarly, Bryman (2008) posits that within qualitative work the researcher will often collect some data, analyse it and use the results of this analysis to influence the collection of future data. Creswell (2007) has characterised the analysis that qualitative researchers undertake as a data analysis spiral:

“…the researcher engages in a process of moving in analytical circles rather than using a fixed linear approach. One enters [this spiral] with the data of text or images ... and exits with an account or a narrative. In between, the researcher touches on several facets of analysis and circles around and around.” (Creswell 2007, p. 151)
Thus the process is an iterative one where the questions one asks, the data one collects and the themes that emerge are part of an evolving process of becoming sensitised to the research situation and what one finds really interesting, through the inherent processes of describing, classifying and connecting to assimilate the final account (Denzin and Lincoln, 2008; Hennink, 2011).

![Data Analysis Spiral](image)

**Figure 3.2**: The Data Analysis Spiral (Creswell, 2007) Permission granted to reproduce from *Qualitative Inquiry and Research Design*; SAGE Publications, Inc.

**Data Management**

Data management, the first loop in the spiral, begins the process (Creswell, 2007). Bryman (2008) recommends that the researcher listen to the data on
several occasions to get a feel for what is said and the manner in which comments are made. Emerging categories, themes and patterns are identified by acquaintance and re-acquaintance with the data in this way (Polit and Beck, 2014). Verbal data was recorded on digital audiotape and transcribed (Creswell, 2007).

Typically a focus group will generate much discussion, and sometimes participants will talk over each other, which makes accurate transcriptions impossible, and transgressions likely (Hennink et al., 2011; Saldana, 2013). Indeed, much time was spent with re-acquaintance through watching and listening to the video footage, which facilitated a sense of capture of the whole discussion, as it was constructed and contextualised, whilst cementing individual nuances and comments appropriately (Bryman, 2008).

Once familiar with the data, additional field-notes and observations were made such as keywords and summaries of key discussions; significant comments and ideas were identified and listed - coding could then occur (Bryman, 2008). The frequency of these was also noted (Denzin and Lincoln, 2008). Within the cyclical nature of the analysis and reflection, this was reviewed and amended as on-going immersion within the data occurred (Charmaz, 2006).

The first stage of the data management phase was undertaken alongside the continuing collection of data from the second focus group, allowing the researcher to check and develop emerging areas of interest and importance. Creswell (2007) highlights that within qualitative approaches the research design may change throughout the process and there is a need to maintain flexibility; this facilitated greater attention to confirming expressed thoughts and contributions
from the participants. Indeed, Denzin and Lincoln (2008) assert that qualitative research is endlessly creative and interpretive. The researcher does not just leave the field with empirical materials and then easily write up the findings but qualitative interpretations are constructed (Polit and Beck, 2014). The writer-as-interpreter moves from field text to research text. This text is then re-created as a working interpretive document that contains the writer's initial attempts to make sense of what they have learned. Charmaz (2006) and Creswell (2007) argue that such a position encourages a degree of reflection both on the data and on the researchers own eclectic stance. Creswell’s (2007) spiral of analysis, as the chosen model for data analysis facilitated the continuous movement and amendment between coding and the development of themes as data was constantly checked by interpreting and reflecting on the data and how this emulates with the researcher’s own experience and understanding of a simulation-based pedagogy (Alvesson and Skoldberg, 2010).

**Describing and classifying as an iterative process**

Creswell (2007) suggests a process that disregards predetermined questions in order to ‘hear’ what the research participants *actually* say. This is achieved through immersion and reflection upon the larger thoughts presented in the data to form initial categories. This process consists of moving from the reading and memoing loop into the spiral to the describing, classifying, and interpreting loop. In this loop, code or category (and Creswell uses these terms interchangeably) formation represents the heart of the qualitative data analysis (Denzin and Lincoln, 2007; Hennink et al., 2011). Bryman (2008) highlights that within thematic content analysis the researcher is not specifically advised how to identify
themes. However, a process of coding and categorising data will aid the development of themes for analysis this will ensure categories and themes connect and reflect the data collected (Creswell, 2007). Further, Miles et al., (2013) suggest that the frequency of codes appearing within themes be identified as this may help to demonstrate the importance of emerging aspects to the participants. Creswell (2007) argues that this implies that all codes should be given equal importance; however, the data from the focus group did not reflect this. Bryman (2008) similarly argues that the whole process of coding can lead to a loss of context as chunks of text are removed from the whole, in a process described by Creswell (2007) as ‘winnowing’. Indeed, Bryman (2008) considers that it is the researcher’s responsibility to develop a shortlist of tentative codes that match text segments, regardless of the length of the original narrative and this was the case within the analysis of the data within this study.

Code development is an evolving, iterative process in which new codes are added, code definitions refined, and codes combined as data analysis progresses (Denzin and Lincoln, 2008). Code development stops at the point of saturation (Polit and Beck, 2014), when no more new ideals are identified within the data; it could take several focus groups to reach this point. Importantly, prolonged engagement was achieved. Guba and Lincoln (2008) highlight how this can enhance the credibility of the research. These skills required the researcher to spend sufficient time in the case study site to gain full understanding of the phenomena being investigated (Bowling, 2014). During the final focus group [FG2] emergent concepts were beginning to confirm previous expressions confirmed within the analysis, indicating that an early level of saturation was emerging (Freeman, 2006). Completeness of data was concerned primarily with
gathering multiple participant perspectives so that as complete a picture as possible of the phenomena could be portrayed (Yin, 2009). This approach followed the general guideline for analysing the data for significant phrases, developing meanings and clustering them into themes, and presenting an exhaustive description of the phenomenon (Creswell, 2007).

**Connecting with the Accounts**

Once categories had been identified and analysed, connections between categories can be made, reducing their overall number, as detailed within the third loop of Creswell’s (2007) spiral of analysis. It was considered that the results of the content analysis and subsequent emergent themes would resonate strongly with what the participants’ detail as the characteristics that make simulation effective within nurse education. The theme names were aimed at specifically answering the research questions. The categories were developed from the individual and collective instances and participant phrases evidenced from the analytical coding process (Saldana, 2012); inductively generated words evoke a visual analogy and are considered to be a powerfully expressive tool (Miles et al., 2013; Polit and Beck, 2014). The themes were further used to describe the inherent stages and positive challenges as reported by the participants (Denzin and Lincoln, 2008). In each case a judgement was made as to whether the participants were using the word or theme as it would commonly be defined and understood (Creswell, 2007). Any anomalies were explored in greater depth, as this process served to reveal how participants within a community conceptualise, experience and feel regarding their learning within simulation.
IV. Rigor within qualitative case-study research

As with much qualitative data, the findings from this research will be subjective and individualised and thus the generalisability to other groups or situations may not be apparent. However, as Hammersley and Atkinson (1995) argue the experience of many research participants is so diverse that generalising findings is inappropriate. It has been increasingly recognised that it is wise within qualitative work to adopt measures of rigour fitting to the naturalistic style (Denzin and Lincoln, 2008; Alvesson and Skoldberg, 2010; Polit and Beck, 2014). Typically, these authors turn to the original work of Lincoln and Guba (1989; revised 2008), which has been presented as a decision trail fitting to maintain rigour in qualitative work. The decision trail consists of ways of establishing trustworthiness within the qualitative paradigm through the following framework:

• ‘Credibility’
• ‘Transferability’
• ‘Dependability’

These aspects will be used as a framework for assessing the rigor within this study.

Credibility

Credibility relates to the confidence in the ‘truth’ of the findings, and has validity when the instrument measures what it has intended to measure (Sandelowski,
Guba and Lincoln (2008) suggest that the ‘truth value’ of a qualitative study should be evaluated by its credibility rather than internal validity as in quantitative research methods. They state that the determination of credibility can be accomplished only by taking data and interpretations to the sources from which they were drawn and asking them whether they believe the results or find them plausible (Guba and Lincoln, 2008).

A qualitative case-study study is thus deemed credible if it reveals accurate descriptions of individuals’ experiences, and that people having that experience would immediately recognise it ‘as their own’ (Houghton et al., 2013). Credibility is further enhanced if other researchers or readers confronted with the experience can recognise it, after having only read about it in a study (Creswell, 2007). Initially, the researcher considered employing ‘member-checking’ as described by Guba and Lincoln (2008); typically, member-checking is viewed as a technique for establishing to the validity of an account. However, this has met with much criticism (Sandelowski, 1993; Angen, 2000; Morse, 2012). This is due to the beliefs that the process itself may lead to confusion rather than confirmation, because participants may change their mind about an issue, or have had new experiences since the time of contact that may have impacted upon their original responses. Further, if the study results have been synthesised, decontextualised and abstracted from individual participants, there is no reason for individuals to be able to recognise themselves or their particular experiences (Morse et al., 2012; Houghton et al., 2013).

The aspects of credibility were addressed both during and after the data analysis. Firstly, the researcher utilised digital recording of the interviews, which decreased
the possibility of selective filtering of the data through errors in recall (Guba and Lincoln, 2008). Immersion within the verbal data occurred through listening to the tapes on several occasions and checking that the comments identified accurately reflected those made (Polit and Beck, 2014). To ensure that a truthful account of the discussion has been presented, narrative sequences of the original data will be presented to support the findings.

Bowling (2014) suggests that the researcher should be honest about their theoretical perspectives from the outset; Freeman (2006) further believes that credibility is particularly dependent on the credibility of the researcher. Within qualitative research, the researcher is typically seen as the instrument of data collection and the centre of the analytical process (Denzin and Lincoln, 2008). As such, the researcher made explicit what they brought in terms of experience and perspective (Alvesson and Skoldberg, 2010). However, this continues to pose a challenge to the credibility, as a nationally recognised simulation lead; however, honesty through reflexivity was strived for throughout. This was predominantly achieved through verbalising the researcher’s own perspective relating to striving to generate shared understandings, envisioning and creating a shared effective simulation-based pedagogy within nurse education.

A process of peer review was undertaken following each session by the researcher and peer observer; this was utilised as a strategy to enhance rigour an enabling process of the inquiry that facilitated reflexivity and sharing of thoughts that might otherwise remain only implicit within the inquirer's mind (Lincoln and Guba, 2008; Alvesson and Skoldberg, 2010). It is important to clarify that this person was offering critical feedback to the data management and research
process rather than the professional development process (as detailed within the peer debriefing process on page 19). This can be seen as advantageous to the research process; in conducting the research as an ‘insider’ to both the nursing profession and the growth of simulation nationally, the researcher has an understanding of the themes that have been discovered and the envisioning of their significance (Creswell, 2007; Bowling, 2014), thus peer review, in this way, was welcomed. To further apply good practice within the focus groups, mindful of the potential for power relationships between researcher and participants, external research was undertaken, and tilting the balance of power towards the focus group was achieved through their greater number (Denzin and Lincoln, 2008; Hennink et al., 2011).

**Transferability**

‘Transferability’ relates to whether the findings of a qualitative study are applicable in situations other than the one studied (Guba and Lincoln, 2008; Hennink et al., 2011), while still preserving the meaning and inferences from the complete study (Freeman, 2006). Denzin and Lincoln (2008) refer to this as ‘fittingness’, which replaces the term generalisability; they contend that the research findings can fit similar situations of interest and scenarios, and a qualitative study whose findings ‘fit’ contexts outside current research study situation can be described as having fittingness.

Ostegaard and Rosenberg (2013) recommend that situations should be analysed to assess if they are similar enough for the findings to be of significance. Therefore, whilst the findings of this research will be subjective and potentially
unique, they may well be transferable to or fitting for other similar scenarios and situations (Houghton et al., 2013).

Thick descriptions are presented within the analysis through the participant quotes, a process that is described by Lincoln and Guba (2008) as a way of achieving a type of external validity. By describing a phenomenon in sufficient detail one can begin to evaluate the extent to which the conclusions drawn are transferable to other times, settings, situations, and people. Indeed, the descriptive interpretation that results from the analysis of this research could apply to other areas as the aim of this study was to produce rich data that describes and explicates what makes simulation effective within nurse education. Within this discovery the researcher repeatedly referred back to the focus group data when developing the key codes and subsequent themes during the data analysis process (Creswell, 2007).

An important aspect of this study was whether the findings were applicable to other nursing HEIs within the United Kingdom. As Ostegaard and Rosenberg (2013) indicate, readers of research reports make their own judgements about the relevance of the findings to their situation; it is important within transferability that readers view the study findings as meaningful and applicable in terms of their own experiences (Sandelowski, 1993; Denzin and Lincoln, 2008; Polit and Beck, 2014). Therefore, an independent working group gathered for a simulation standard setting meeting (November 2013) were asked to read and comment on the findings to that date (Reed, 2010) in the form of peer debriefing. As Alvesson and Skoldberg (2010) highlight, the use of independent experts ensures conceptual clarity of the data and embraces reflexivity. Some authors advocate
using an external colleague or ‘expert’ (group) to support the credibility of the findings (Hennink et al., 2011; Saldana, 2013). However, the usefulness of this has been debated in the literature. Lincoln and Guba (2008) suggested that peer debriefing make researchers’ interpretations of the data more credible if peers define the data in the same way. Analysis in qualitative research is an individual, unique process between the researcher and the data, thus, no two researchers will interpret the data in the same way (Cuttliffe and McKenna, 2000; Saldana, 2013).

In this study, the purpose of peer debriefing was to verify whether or not simulation experts would agree with the coding process, data labels and the logical paths taken to arrive at the same key themes (Graneheim and Lyndman, 2004). The discussion held highlighted the same main issues, and dialogue arose to explore these and their presentation and linkages. This enhanced the credibility-supported transferability of the study findings. This independent practice group were asked to comment on both the credibility and transferability of the findings. Informal comments provided by these individuals supported the transferability of the findings presented in this study.

**Dependability**

‘Dependability’ is defined as the degree of consistency or reliability with which an instrument measures the attribute it is designed to measure (Graneheim and Lyndman, 2004; Polit and Beck, 2014). In qualitative terms dependability refers to the consistency, repeatability, replicability or stability of a study in terms of the clarity and accuracy of the final research report (Lincoln and Guba, 2008).
contrast to quantitative research, which aims for repeatability of measures and consistent responses, qualitative research emphasises the uniqueness of human situations, and the importance of experiences that are not necessarily accessible to validation through the senses (Denzin and Lincoln, 2008). These authors further suggest that a study may be judged as reliable if the reader can follow the ‘decision trail’ of the research process; in support of this, Creswell (2007) suggests that researchers employ accepted strategies to document the ‘accuracy’ of their studies in order to achieve validation. To this end, Polit and Beck (2014) recommend that extensive records of the research process are taken and made available for others to audit. Within this study, extensive sequences of the original data have been included to robustly support the research findings, discussion and implications for practice. Similarly, the decision trail used is inherent (Sandelowski 1993; Creswell, 2007; Houghton et al., 2013).

This study has been written with a view to allowing the reader sufficient detail and information to check the ‘decision trail’ (Denzin and Lincoln, 2008). Furthermore, the focus group interview was used in the study to explore in-depth the groups’ perspectives to gain qualitative data; thus the interviewer as researcher was the data-gathering instrument (Denzin and Lincoln, 2008; Alvesson and Skoldberg, 2010). The reliability of the data elicited is therefore dependent upon the competency and ability of the researcher’s focus group interviewing skills, and on any researcher bias (Graneheim and Lyndman, 2004; Polit and Beck, 2014). Realistically, and through a peer support mechanism, it is likely that as this study progressed and this researcher’s focus group interview technique developed the quality of the data also improved (Alvesson and Skoldberg, 2010), particularly from the pilot to the main study.
Another method of achieving dependability is to have another researcher independently categorise items as a check against bias, a process referred to as ‘external audit’ by Miles et al., (2013). This provides an opportunity for an outsider to challenge the process and findings of the research study; the outsider should be able to analyse the data in the same way and reach the same conclusions as the original researcher (Bowling, 2014). This approach was also carried out in this study. There was readily available access to simulation fellows within the workplace, along with a supervisory team. Whilst this further analysis was congruent with the initial interpretation, and conceivably enhanced the rigour of the analysis, Alvesson and Skoldberg (2010) have made a case that it is conceivable that another investigator could write a different structure of style, but Bowling’s (2014) experience details that it is never wholly different; rather, it is divergent because another investigator is looking at the same data slightly differently. Consequently, the control comes from the researcher’s context or perspective of the data (Creswell, 2007).

Once the context and intention becomes known, the divergence is usually intelligible to all, even if not universally agreeable (Denzin and Lincoln, 2008) – a point in analysis where the external researcher may identify extra areas for consideration (Bryman, 2008). Thus, Alvesson and Skoldberg (2010) suggest that the chief point to be remembered with this type of research is not so much whether another position with respect to the data could be adopted – this is granted beforehand – but whether a reader, adopting the same viewpoint as articulated by the researcher, can also see what the researcher saw, irrespective of whether they agree with it (Houghton et al., 2013).
V. Summary

Within this chapter the rationale for the research design and methodology of a context-specific, single case-study approach has been explored and presented. It provides the setting for the analysis, synthesis and reflections upon the findings of the study to support the explication of the characteristics that make simulation effective within nurse education. The methodological decisions and methods adopted for the study have been justified and detailed accounts of the measures taken to ensure veracity and rigour have also been presented, and sought to set the scene for establishing trustworthiness within the qualitative paradigm. The following chapter will present the data analysis and the research findings relevant to the research aim and questions posed.
CHAPTER FOUR

RESEARCH FINDINGS AND ANALYSIS

I. Introduction

Through the iterative data analysis process the theme and category development was part of an evolving process to assimilate the final account presented here (Denzin and Lincoln, 2008; Hennink et al., 2011). In specifically addressing the research questions three themes were developed each containing relevant categories of analysis and synthesis (Saldana, 2012) and these formed the framework of chapter four (Figure 3.2, Creswell, 2007). The synthesis culminates into a conceptual model for professional practice. Whilst there was no particular significance to the order of the themes their name relates directly to the research questions asked and findings from the literature review, facilitating a deductive analytical framework. As such, presentation begins at the level of curriculum design, moving through to the implementation of simulation-based sessions, concluding with the evidence for the transferability of skills learnt to the realities of clinical practice (tables 2, 3 and 4 respectively). This approach aligns with the research aim to explore, describe and seek to develop the characteristics that make simulation effective within nurse education.

The codes used for the participant quotes and responses relate to Focus Group number (FG1, FG2 and FG3, Figure 3.1). Students are identified with the prefix S, for example Student 3 of FG1 would be referred to as FG1 S3. The Academic Educators are identified with the prefix E, for example E2. With regards to the
differentiation between the two curriculums currently in implementation within the HEI, curriculum for the cohort 2008 is identified as C08, whereas the 2012 cohort is identified as C12. The significant difference between these two curricular is that efforts had been made to integrate simulation within the curriculum for 2012, however, this was not the case for the 2008 cohort as simulation was in its infancy during this time period. Within the 2012 curriculum students were progressively exposed to simulation activities from the level of basic tasks to fully immersive complex scenarios to develop their patient management and leadership skills. The three themes and their categories are:

- The approaches that academics use to integrate simulation into the nursing curriculum;
  - Establishing the nature of simulation activity
  - Furthering the learner experience
- The influences and decisions academics make to deliver simulation-based nurse education, and their impact upon the student learning experience;
  - The fundamentals of facilitating simulation
  - The challenge of the debrief
- Evidence for the transference of skills, acquired through simulation-based nurse education, to the reality of clinical practice;
  - Furthering the essential skills of the nurse
  - The role of realism
  - Assimilating knowledge and skills for nursing practice
II. Theme 1: The approaches that academics use to integrate simulation into the nursing curriculum

The first theme relates to the approaches used by academics to integrate simulation within the nursing curriculum. The categories that emerged within this theme featured strongly throughout the focus group discussions and included similar clustering's around: ‘case based scenarios’, ‘learner-centred’, ‘curriculum integration’, ‘repetition’, ‘constructivism’, and ‘peer and team-working’, which all presented as key integration features (Saldana, 2012). In order to explicate how these features contributed to making simulation effective, two broad categories of analysis emerged, which held significance as to the way that simulation was integrated into student learning opportunities:

- Establishing The Nature of Simulation Activity
- Furthering The Learner Experience

<table>
<thead>
<tr>
<th>Category</th>
<th>Grouped Comments from Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establishing The Nature of Simulation Activity</td>
<td>Constructive</td>
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Table 2- the approaches to integrating simulation within the nursing curriculum that academics’ use.
Establishing The Nature of Simulation Activity

Within the category of *the nature of simulation activity* rich descriptions were captured regarding how academics approached the implementation and embedding of simulation throughout the curriculum. The opening question posed related to this aspect: “*are there any specific approaches that you’ve used for integrating simulated learning experiences for the students?*” The group took a short time to think about this response, as evidenced within the field-notes: “*We’ve recently enabled this [simulation] on a greater scale… because the resources have increased… haven’t they?*” [E3]. In-group support, overlapping “yes” could be heard in the background.

Two differing styles to the implementation of simulation within the nursing curriculum, driven by the availability of resources, emerged early from the focus groups: “*Yes, for the students in the current curriculum [C08], we didn’t have such an extensive family of manikins; as a result they did not get introduced to simulation until their final year of training. Whereas, for the students on our new curriculum [C12] they quickly learn the very nature of simulation activities as we engage them early on in their training…*” [E4].

There was a notable difference between early curriculum implementation and late implementation. Students who had commenced their training following investment in greater simulation resources were introduced to it at the beginning of their programme. This resulted in expressions of an integrated approach to the simulation activities [C12] and the academics could verbalise how they developed these over time into students attaining experiences of greater complexity [E4]. This was further evidenced from E3: “*That’s true, we’ve now introduced it from the*
first module within C12… and eventually, in their final year, our new students will be able to deal with much more complex simulated cases than previous students”. The 2005 BEME review emphasised, the integration of simulation-based medical education into the curriculum was seen as vital (Issenberg et al., 2005); whilst this systematic review considered medical education only, more recently support for the integration within nurse education is following suit (Bland, 2011 et al.; Kable et al, 2013).

Simulation integrational activities developed by the academics were reported positively within the student focus group of C12: “I think it was good to do the essential skills like, vital signs recording in simulation before being out on placement because I think in placement, I will just go and get someone more senior to help… I wouldn’t have had any confidence if I hadn’t been able to practice the skills first…and get it right!” [FG3 – S2]. Further to this, S3 added: “I think that as we do more [simulation] and repeat and advance the patient cases in the scenarios, we’ll get more used to it and develop our skills and knowledge much more so”.

The notion of gaining familiarity through ‘hands-on’ practice and repetition featured strongly from the students’ perspective. The students were able to verbalise how the integration of simulation enabled greater understanding and knowledge enhancement through both activity and visualisation. For instance, a comment made within FG3 by S1 developed this: “I prefer and learn in the skills labs and by actually doing it. We’ve used simulation on the models quite a lot throughout year one… it made everything visible. We haven’t had many new skills to develop this year… so we’re now working on bringing those skills that we
The students were happy to share their positive expressions towards the way they were developing their expertise. Indeed, purposeful repetition and the ability to advance their own practice were commonly shared ideals within this particular student group. This was often coupled with a strong sense of ‘doing it’ and ‘putting it into practice’, which shone throughout the transcripts. These statements indicated a strong student preference for constructive and active-based learning to facilitate knowledge growth (Parker and Myrick, 2009; NMC, 2010b).

Knowledge construction, through the notion of progressive practice and purposeful repetition to become more proficient, can be aligned to the five-stage typology of developing expertise (Dreyfus and Dreyfus, 1986). This model has been extremely influential within nursing education and practice, as applied by Benner (1984) (whose work does pre-date the Dreyfus’ publication, but was nevertheless based on it). At face value, this can be considered to be a linear progressive scale. However, it has been acknowledged that movement in both directions is to be expected, especially when facing new situations (Benner, 1984). Figure 4.1 diagrammatically represents the Dreyfus and Dreyfus (1986) model.

Figure 4.1 Drawn from Dreyfus and Dreyfus (1986) five-stage typology of developing expertise.
This is an appropriate foundation model to place here, this suggests that over time, and where the actions are repeated, more complex activities are subjected to deliberation, and a level of competence can be achieved (Dreyfus and Dreyfus, 1986) – notions that this student group were verbalising. Whilst the group reported no new skills had been learnt in year two, there was a strong sense of developing upon previous skills and applying these to new patient situations. This would add strength to the notion that when simulation activity is integrated throughout the curriculum it is more likely to escalate the students’ participation level from a novice to the achievement of competent, proficient and ultimately to expert levels of student practice.

The findings within this theme facilitated the first phase in the development of a conceptual model, which was integral to the process of preparedness for practice in relation to verbalising critical reflection and professional, progressive learning and confidence growth. A finding from this study was the belief held by students and academics that the earlier and wider the simulation activity and opportunities are introduced, the more likely that advanced levels of practice could be achieved. Students were more satisfied with their simulation activity and experience when it was introduced at the beginning of their educational programme, and where they could work as a team and learn from each other in an active, collegial way (Forrest et al., 2013; Campbell and Daley, 2013).

Whilst both the academic and student participants reported an integrated approach within the newer C12 curriculum, in contrast, the C08 students reported an ad-hoc implementation of simulation activity at the discretion of the module leader, which was seen to be less positive by the students, as E3 illustrated: "on one occasion in my module I wanted to see how they [students] work as a team."
Whether they were the leader or they stood back etc….” This was used as an example of personal choice to utilise simulation within the C08 student group and this was probed into further by the group facilitator: “How did the specific approaches you used differ in this instance from what you do in the new curriculum?” “Well, it turned out quite tricky really, as this group hadn’t had any previous exposure to the SimMan… so they didn’t really know how to react at first… I tried to get them to focus on the task… which was my learning outcome for the session… and they did eventually get into simulation and the given patient case”. E4 added: “Yes, but we did have to support the group quite a bit through it, but they really enjoyed it in the end… however, there’s no time to add any more into their programme…” Within the commentary provided by E4, it would appear that the students had not been successfully inducted into the context of simulation and did not know how to approach the situation or what was required of them; the students could be typified as novices (Dreyfus and Dreyfus, 1986). Indeed, the C08 students were quite clear regarding their thoughts for the practice they had encountered, as they described the need for earlier introduction to simulation: “We have said, we think… we’re very late in doing this [simulation]. We needed it in year one from day one… and for it to reinforce our learning through repeated practice throughout our programme” [FG2 – S4]. This was supported by S7, who stated: “I agree, our confidence was quite good, but this needed to build from the first year and that way the impact would have been greater…we’re like now… ‘What’s this?’”

Throughout the analysis, the evidence suggested that the students who were introduced early were beginning to achieve a level of simulated activity by the beginning of year two that the previous curriculum students (C08) did not achieve
until the end of their final year of training (some 20 months later). This difference was reportedly due not only to an initial lack of available resources but also a lack of dedicated curriculum time since acquiring the new resources, which suggests both operational and integrational issues.

Eraut (2007) would align such student experiences to those of a ‘newcomer’ distinguished by the students not knowing what was going on around them and what precisely was expected of them. Furthermore, Scherer et al. (2007) demonstrated that this approach left students unsatisfied with the whole encounter. Where simulation activity was reported to be particularly challenging when it was not routinely applied throughout the curriculum, and when the students lacked situational perception.

Whilst there was a lack of evidence to support the constructive integration of simulation throughout the curriculum for the C08 student group, the academics were keen to share their perspective that it was in fact the learning outcome that was driving simulation activity; as example of operational function, E1 offered: “we always make sure that we know and the students know what the learning outcome for the session is… that way we can be sure that the simulation activity maps to that…” This was supported by E2: “yes, we are all clear of the learning outcomes and we can ensure that the experience provides the opportunity for the students to both gain and apply their knowledge… some students aren’t very confident… but that’s because they are just not familiar with the equipment…” These statements appear to link positively to constructive alignment, where knowledge is generated and directed from the given learning outcomes. Importantly, from the academics perspective there was evidence that the students
were able to learn from their experience and acquire a level of tacit knowledge, albeit at a novice level (Dreyfus and Dreyfus, 1986; Eraut, 2007). Typically, the levels of practice achieved by the C08 group concluded at a point where they were barely familiar with the simulation process. As such, the re-visiting of skills and actions through this method was missing, and the potential for advancing knowledge construction and confidence growth was lacking (Dreyfus and Dreyfus, 1986; Lave and Wenger, 1991).

The findings within this theme alluded to the evidence in support of the early embedding and integration of patient cases through structured simulation activity (Benner, 1984). This was verbalised and aligned to particular modules of study within the C08 curriculum and was undertaken on an ad hoc basis, receiving a mixed response from the student group. The verbal commentary offered by the academics did outline how simulation was timetabled from year one, through two and three within their new programme (C12) and they were able to verbalise embedding and constructive integration as the students progressed (Berragan, 2011). Overall, the academics’ perspective held that the nature of simulation activity in C12 had a greater impact within an integrational curriculum approach, which led to greater confidence within the simulation setting and greater satisfaction of experience and knowledge gains from the student participants.

**Furthering the Learner Experience**

Within this study, it was considered important to establish how the learners viewed their experiences within simulated practice in the light of the educational principles employed by the academics within learning and teaching. Within this
category, descriptions were captured regarding how academics sought to nurture the development of peer-support, team working and knowledge integration within the teaching and learning experience.

From the student perspective, S4 [FG1] opened this particular discussion attempting to articulate how simulation has affected their own learning: “Undertaking the simulated exercise allowed us to recognise things that the patient would experience… because it’s like a real situation, especially like what we’ve had recently… where we didn’t have a lecturer in the clinical room and we could just do the job and work together…” “Yes, I agree… I think it is through the approach of it being realistic that has had a real impact on my learning… something we would actually see and what the patient actually does and would say to us in the clinical area” [S5]. Throughout the data analysis, there was an overwhelming sense from the student participants that they were at the centre of the educational encounter during the learning activities. Indeed, this is considered to be a firm strength to simulation (Leigh, 2008; Bambini et al., 2009; Nickerson et al., 2011); furthermore, it is suggested that this sense of learner-centeredness is one of the reasons for its popular application within nurse education today (Parker and Myrick, 2009; Berragan, 2011; Kable et al., 2012).

The student can really grow in their connection with clinical practice through the nurturing approach offered by the teaching team within simulation (Newmaster et al., 2006). Indeed, many of the participants were in support of structured learning in this way. “I think the way we were able to talk to each other was very useful … it made me think about how I do things…” [S6]. The notion of sharing responses and supporting each other was evidenced further within the narratives of FG1,
where S7 stated, “We learn to rely on each other. Sometimes when the lecturers 
are there [in the simulation room] we are given resources like charts… but we just 
look at the lecturers for the answers instead! And not really try to work things out 
for ourselves.” S7 further adds; “…but when it’s just us we look at each other and 
bounce ideas off, and make the decisions ourselves”. The students were 
describing how they worked inter-dependently when the academic was not in the 
room, supporting social learning and developing a notion of peer-generated 
scaffolding; students demonstrating the ability to develop and integrate knowledge 
to further their understanding and management of the given clinical scenario, 
which appeared to go beyond peer-support.

Indeed, learning through socialisation is considered to be a fundamental aspect of 
nurse training – principally the ability to work within different teams (NMC 2010a 
and b). Further, Bradley and Postlethwaite (2003) draw attention to ways in 
which constructivist methodologies allow for such learning. In this case study, it 
was through the unique presentation of collaboration through this peer-generated 
scaffolding that constructivism was revealed and this developed upon the initial 
literature descriptions of individuals’ collaborative elaboration (Brydges et al., 
2010). It has been asserted that discussing and sharing responses reinforces the 
repetition of satisfying results, which causes further individual learning to occur 
(Vygotsky, 1978; Lave and Wenger, 1998; Duffy and Jonassen, 1992; Grunwald 
and Corsbie-Massay, 2006). The elements evidenced within this case study not 
only supported this but demonstrated and furthered a student approach which 
drew upon the differing experiences of peers to support each other in a unique 
way to move through the zone of proximal development and beyond their current
limitations to that of satisfying group achievement (Wood et al., 1976; Vygotsky 1978).

The notion of peer-generated scaffolding through the sharing and discussing of ideas within care began to emerge early within the participants discussions, and was evidenced from both a student and academic perspective. E5 detailed how this had been demonstrated; “They learn from each other as they go along. Some of them may not have had acute placements, they may just have been on areas where no acute care took place and then they come into a room and team up with somebody…for instance, a student who has had more acute care experiences, and they will pick up really important things from them… as well as us guiding and facilitating the session they really do help each other. Like, ‘why didn’t I experience that for real?’ But they’re learning from other students all the time, and I do feel as they progress that they also get this sense too.” This example is supportive of the hypothesis that simulated events provide the opportunity to experience incidents that may not have otherwise been encountered, predominantly enabled through the interaction, collaboration and dialogue affording through simulation experiences. Lave and Wenger (1991) describe this approach as ‘situated learning’ and contrast it with a more traditional apprenticeship model of education and professional training; they describe situated learning as a way of bridging the theory-practice gap, rather than separating out education and training from practice often described within the literature.

Student participants also provided supportive evidence that case based scenarios extended opportunities to share in experiences. As they began to share thoughts
regarding their learning experience the groups were asked: “In what way has your learning been affected by simulation activities?” “It has definitely increased” [FG2, S2]; “I can see how it impacts on my confidence and capability to work with others” [S3]; “Yeah, it’s like… I can do this now… we were all supporting and helping each other… just as it should be in practice… being a nurse!” [S6]. Within the free-flow of responses and the majority of the students beginning overlapping conversations came a real sense of enhancement of confidence and capability through on-going collaboration with each other. S3 furthered this discussion: “because it’s a different experience… different to placement… that’s why it’s good, I think when there is an actual group of you you’ve all got individual skills”. S5 offered: “Yeah, you’ve got something individual to offer haven’t you? It’s our combined skills that get us through it though”.

Poignantly, through narrative S7 [FG2] was able to detail a specific aspect of clinical expertise that she brought to the simulation, “I have been working in cardiology for 12 weeks, in terms of my clinical practice… So we’ve got different angles to bring, I led on the heart monitoring side of the patient care because I was quite capable of that… some in my team weren’t familiar because they haven’t done cardiac… I realised though, that I didn’t fully understand the A to E approach to assessment so S3 and S4 took the lead on this. That is something I will remember and take with me next time.” Reflecting upon their learning, following active participation was evidenced along with an element of self-assessment within the dialogue of the narratives. The work of one particular reflective theorist aligns well with the principles inherent within simulation (Waldner and Olson, 2007), and is used extensively within nursing. Kolbs’ (1984) experiential theory goes beyond repetition of practice to describe a process of
learning through experience. Whilst Kolb’s (1984) model is often depicted as a cycle, deliberate reflection on experience is essential, however, it is acknowledged that reflection and experiences do not always occur, as neatly as such a cyclical process would suggest (Paterson and Chapman, 2013), and though normally one may start with the experience, the loop can be started at any point. Fundamentally, it is the reflective practice that is an important tool within practice-based professional learning such as nursing, where students learn from their own professional experiences, rather than reliance upon formal learning or knowledge transfer (Gaba, 2011).

The findings and dialogue regarding reflection from this case-study were significant and furthered the development of the conceptual framework driven by the data analysis and synthesis, an outer circle of reflection could be added to demonstrate the application of reflection throughout the simulation event (Kolb, 1984) – this has been diagrammatically represented in Figure 4.2. The outer circle develops the model to demonstrate a process of learning through experience that begins with the learner having an initial experience. The learner makes that experience meaningful by reflecting on it, and the meaning that the learner gleans from the experience through reflection is then conceptualised and incorporated into existing cognitive frameworks. This expanded knowledge (cognitive framework) is then applied to a new situation where experience again is gained, reflected upon, conceptualised and incorporated into the knowledge base (Waldner and Olson, 2007).

Collaborative learning is at the heart of simulated activity (Hope et al., 2011) and goes beyond peer-supported learning to embrace the notion of peer-generated
scaffolding as detailed within many of the student narratives. From an academic perspective this brings with it a sense that the opportunity exists to integrate more complex and challenging activities which in turn are more likely to escalate the level of criticality needed by the collaborative student group (Benner, 1984; Knowles et al., 2012).

Figure 4.2 The application of reflection to escalate the level of student competence, this model builds upon Dreyfus and Dreyfus (1986) to bring in Kolbs’ (1984) experiential reflective cycle.

Interestingly, some of the academics were more cautious about allowing students to work in a collaborative team without direct facilitation and supervision. In offering an opportunity to triangulate students’ enthusiasm for group learning, the academic participants were asked: “What factors do you think might increase the
student involvement and engagement within the learning activity?” “Well it depends on the individuals because if you’ve got students who are vocal they get involved and the rest of the group just stand back…” [E4]. Another academic went on to detail some of their experiences: “…You can actually have a group of three or four who are actually very strong and supportive and the whole scenario just starts to flow…” “Yes but there’s usually somebody in the team who would be weak in the group…” [E3].

This dialogue concluded with E5 stating: “When you do see that somebody is taking the lead… you do wonder how much the others get out of it…” “I guess if you were to ask them individually after… you would see!”. It appeared from these narratives that the academic were somewhat sceptical that the whole group could work and learn equally within an un-facilitated team-working scenario. By way of contrast, the data provided evidence that the student participants were beginning to articulate learning through peer-generated scaffold with the sharing of their knowledge and previous experiences; indeed the students were able to detail how they could master given tasks through this structure to higher level learning.

Whilst the academic group were a little sceptical of the extent and depth of the group learning, they were able to detail some examples of peer learning within simulation. Whilst the benefits of collaborative learning have been recognised previously (Smith and Roehrs, 2009; Hope et al., 2011), the bringing together of unique clinical instances from different areas of practice to assimilate and manage a new patient scenario would appear to be a unique finding that has not been reported previously in the simulation literature.
In support of the use of reflection (Figure 4.2), several of the student participants were able to articulate how variance within simulation activity could further enhance their learning: “It would have been good to have patient scenarios that we can build a case upon and follow it through our training” [FG1 – S6]. This was an interesting suggestion and could work well when aligned to escalating patient complexity within cases through collaboration and with the furthering of professional knowledge and skills of each individual student nurse (Dreyfus and Dreyfus, 1986), whilst furthering the notion of experimentation of the new knowledge gained (Kolb, 1984). “It’s actually seeing them [patients] that I want. I could picture it rather than looking at the text” [FG2 – S5]. These comments were suggestive of an enquiry based approach with a strong sense of ‘visualisation’ emerging, the ability to ‘actually see what would happen’ through the playing out of clinical events.

This notion of making visible was supported in several student examples, as was the need to further their experience through experimentation. FG1 and FG2 were in their final year of nurse education, and one participant explained: “it’s like if you do a lecture, when we did it on the cardiovascular system, it would be great if after this, you could go do a simulation activity about somebody that’s having a problem with the cardiovascular system soon after” [FG2-S1]. “Absolutely, and it’s like you would get the opportunity to put the theory with the practice altogether… whereas now we just get the lecture and that’s it… I learn more by actually seeing it” [FG2 – S3]. There was global support for this within the group, when probed further to expand upon this, S5 offered: “It’s about doing the same thing in different ways… I like to re-visit topics to make sure I’ve really understood them… especially before I go into practice!” The students were expressing a
need to experience confronting challenges in the workplace, within the complexities of context that they would undoubtedly experience in clinical practice. Such expressions have resonance with constructive alignment (Briggs and Tang, 2011), which fundamentally aims to ensure that the learning outcomes are deliberately aligned to the learning activities in a way that the learners can construct meaning from activities they undertake, in a progressive way.

Further, competence in performing routine procedures is developed through coping with the demands of the simulation; they become automatic and increasingly tacit through the repetition of directed rehearsal for practice scenarios (Dreyfus and Dreyfus, 1986; Briggs and Tang, 2011). Reflection upon their current experience promoted a desire within the student groups to be offered further, more challenging cases that they could actively experiment within (Kolb, 1984). There were clear expressions within the student narratives that engagement in this way had the potential to result in concomitant increases in efficiency and effectiveness.

From an academic perspective, one of the narratives drew on the impact of the elements of visualisation and participation, moving students beyond simply knowing to being able to do: “It’s [simulation] like some sort of mirror to look at your current practice… because certainly, so far, there are lots of things that you [the student] pick up from, for example, how monitoring through pulse oximetry works – what the theory behind it is. For first years they will just rely on the technology to tell them what’s happening. And then when you have this discussion at the end… which comes as part of the debrief, you then have comments like, ‘We don’t see that in practice,’ you know, ‘We’re just taught to do
something and now we’ve put it into practice here…’ so sometimes it’s good, you know, it kind of gives you [the student] that window into, like bridging… that window into clinical practice” [E5]. This academic’s emphasis was upon visualising and applying knowledge to articulate problems in real-life contexts (Cant and Cooper, 2009; Harder, 2009) through both reflection and conceptualisation (Kolb, 1984). Uniquely, offering a ‘mirror’ to look at their current knowledge and abilities within practice and a ‘window’ to look forwards and to consider critically how this could be applied into their future clinical practice to cross the metaphorical bridge. Emphasising that dynamic, reality-based learner-centered experiences do indeed have the potential to bridge the classroom-clinical gap by bringing real-life activity into the learning environment, an ideal supported by Cioffi (2001) and Briggs and Tang (2011).

**Theme Summary**

Whilst the data analysis revealed the practical approaches that the academic participants considered to integrate simulation into the curriculum, there remains no clear direction as to the best approach. Notwithstanding this, there was an overwhelming sense that the student participants were at the centre of the educational encounter through their experience and were able to learn through participation, reflection and conceptualisation. Further, the majority of students considered that this was how they could best visualise how they would like to learn.

Indeed, there was a strong sense of ‘visualisation’, ‘picturing’, ‘seeing’ and wanting to ‘do it’, very active, constructive and case-based learner-centered
descriptors that put reflection at the forefront of their learning. The perspectives shared were well expressed, particularly from the student voice, and were considered to enhance their learning through collaboration, particularly when integrated from day one of nurse education. In terms of ‘hands-on’ care, both students and academics believed that simulation activity assisted the bridging of theory to practice by visualisation and repetition, particularly when the scenarios were realistic, situated and progressive in nature.

III. Theme 2: The influences and decisions academics make to deliver simulation-based nurse education, and their impact upon the student learning experience

The second theme relates to the influences and decisions academics make to implement simulation-based nurse education, and the impact that these have upon the student experience. Two broad categories emerged within this theme and featured frequently throughout the focus group discussions; they included clustering’s around ‘learning outcomes’, ‘maintaining the flow’, ‘application of the design characteristics within the facilitation process’, ‘preparedness for the role’ ‘assimilation for practice’ and ‘debrief and reflection’ (Saldana, 2012). The two key categories that held significance as to the way in which simulation is delivered were:

• The Fundamentals of Facilitating Simulation
• The Challenge of the Debrief
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<th>Category</th>
<th>Grouped Comments from Participants</th>
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<td>Maintaining the Flow</td>
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<td>Design Characteristics</td>
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<td>Facilitation Process</td>
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<td>Preparation for Academic Role</td>
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<td>Learning Outcomes</td>
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<td>The Challenge of the Debrief</td>
<td>Safety/Trust</td>
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<td>Assimilation for Practice</td>
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<td>The Debrief Process/Structure</td>
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Table 3: The influences and decisions relevant to the academic within simulation-based nurse education.

These categories will be discussed as they relate to the research question within this study (table 3). Previously, within the literature review, design characteristics and facilitation within simulation were considered separately. However, in this study there were many over-lapping codes and emergent categories, which made such separation impractical (Saldana, 2012). Indeed, the design characteristics are considered to be an essential component to the facilitative approach adopted in the implementation of simulation (Jeffries and Rizzolo, 2006; Bland et al., 2011). They are reported to influence the facilitative process that the academic engages within i.e. the planning, delivery and concluding stages within a
simulation-based pedagogy (Wilson and Klein, 2012; Kable et al., 2013). As such, these have been merged into this data analysis.

The Fundamentals of Facilitating Simulation

The category of ‘the fundamentals of facilitating simulation’ refers to the way in which the academic maintains the dynamic flow through the interactions, both verbal and non-verbal, with students to bring about learning, and it includes the integration of the design characteristics. It was considered important to explicate the evidence about how these decisions impacted upon the learning experience. To facilitate discussion around these areas the academics were asked: “What factors have influenced your approach to implementing simulation based sessions?” with a further probing open question of: “can you describe how these decisions have impacted upon student learning?” E3 commented: “…I think working with a team of people who are familiar with simulations and have an interest in simulations is important. That in itself is a bonus to the students because they [academic team] want to actually make the simulation experiences successful”. This was supported by E2, who added” “Yes, I agree, successful in terms of enhancing student learning and how they can apply this to the clinical area”.

There were pauses in the dialogue at times, and on reviewing the video footage and field notes, it appeared that the academic group were respecting each other’s views and giving space for each other to think, clarify their thoughts and speak, an indication of their collaboration. “There’s a small team of us, we debate on the content and design and consider local clinical practice to ensure what we do is fit
for purpose. We also determine, as a team, who has got the right experience and knowledge...and these impact on how we approach each session” [E1]. Within these narratives several elements were being borne out, including the idea that a collaborative team approach enhanced the success of the learning experience. The notion of having a simulation driven by a collaborative team is not unique. Indeed, this has been reported to offer strength to the design, development and delivery of simulation (Starkweather and Kardong-Edgren, 2008; Kable et al., 2013). Berragan (2011) has emphasised that it is the academic who holds the most significant role within the delivery of simulation and its impact upon student learning (Scherer et al., 2007); this most likely occurs through the application of the design characteristics and the facilitation style employed by the educator.

**Design Characteristics**

In analysing the data regarding the factors that have influenced the academics’ facilitative approach, there was a shifting emphasis of the design characteristics and their impact. Include the importance of being dependent upon the ‘learning outcomes of the session’ for E1, ‘training level of the student nurse’ [E2], ‘size of the student group’ [E3], ‘familiarity of the students with the technology’ [E4], ‘repetition opportunities’ and the ‘level of engagement of the students’ [E5]. As such, there was no apparent consistency in the priority given to any one-design characteristic over another; each academic took a pragmatic approach with a unique emphasis.

Acquisition of expertise in nursing is governed by the learner’s engagement in deliberate practice of the desired educational outcome (Ericsson, 2004). A lack of clarity about which design characteristics to prioritise and drive the learning
process is not unheard of; Jeffries (2007) includes objective setting, fidelity, debriefing as the key drivers. Dreifuerst (2009) considers reflection and self-evaluation; Kardong-Edgren et al. (2008) emphasise the importance of having time and opportunity for repetition as key whilst Sando et al. (2011) describe the quality of feedback and well-prepared staff as highly significant. However, what is considered of the utmost importance is the consistency evidenced by the academic team to ensure that the students understand and so can engage with the learning process (Dreyfus and Dreyfus, 1986; Kogan et al., 2012). This involves setting clear learning objectives, repetitive practice and skills assessment followed by specific feedback in order to improve performance in a controlled setting (McGaghie et al., 2009).

Consistency within the learning process and self-evaluation were both evidenced within the student narratives; for instance, S2 in FG3 stated: “When we do simulation, we always seem to approach it in the same way… and I think I have learned to stay calm in these situations now, I won't let other people distress or distract me… but it was really useful in the group situation because you got to see how other people reacted in similar situations and that you could pick up from this and learn and gain more confidence from that too… even though we were all doing the same task, as individuals we all approached it differently.” Similarities were made to clinical practice, an element that the academic team were keen to strive for, in the simulations fittingness to clinical practice, a notion of constructive integration was raised. S3 stated: “… yes, it’s quite similar to learning on placement because we always have a mentor and you work as a team more so. Although I forgot to do the blood pressure, I wouldn’t have in clinical practice…I don’t think I acted as naturally as I do in a placement.”
This particular group had not been using simulation for long [FG3 - C12] and part of the learning outcome was to gain familiarity with the resources. Although the group did feel that they achieved this, their narratives revealed that they experienced a lack of ability to suppress disbelief in these early simulation experiences. Reporting that whilst they forgot to undertake tasks within the simulation they feel that they would have remembered in practice. A strength of simulation is that it offers the opportunity to establish a standardised set up in which all learners are exposed to the same scenario addressing the learning objectives of the curriculum (Ostergaard and Rosenberg, 2013). However, it might present as a challenge for those playing the role of a team member to act exactly the same in all scenarios. The importance of this factor varies depending on the situation – for instance, teaching or assessment modalities. Currently, simulation is incorporated in some of the Objective Structured Clinical Examinations (OSCEs) used in undergraduate education of nurses with positive experiences (Almin et al., 2011); in these instances, reliability and validity become very important, as ‘forgetting’ an intervention could result in high-stake consequences.

**Good Facilitation**

Within the facilitation process the academics in this study attended to the maintenance of flow, where keeping a dynamic situation within a realistic clinical context were reported to be of equal importance. “I was able to really go with the flow of this simulation and this was borne out really well by the student group; the learning objective were clear and were based around a real clinical scenario that necessitated team problem-solving skills… I’m really pleased with how that went. The students were able to undertake self-instruction and I was able to take a step
The notion of intentional self-instruction, as reported by the academic, requires a high level of cognition – as identified by Nickerson et al. (2011).

For the students, the notion of believability had importance. In FG2, thoughts about successful patient management were expressed, and the suspension of their disbelief described: “Even though we knew he wasn’t real, there was an overwhelming feeling that we needed to do well…” [S3], furthered by S4: “the feeling of, you know, we need to move this man to a more appropriate place, he can’t stay here. We need to get him to a ward…” “Yeah, even though we were half way through the assessment process we saw the drop in blood pressure (BP) register on the monitor, and it immediately caught our attention” [S7].

This group were able to establish the seriousness of the patient situation as a team and explore alternative care options, despite knowing that the situation was not real. Fidelity did appear to be an important factor within the effectiveness of simulation for the students. FG2 – S5 reported: “I really liked the way it was life like…it was even blinking and his forehead was sweating! … It made me very nervous at first, but as I got into it I felt my confidence grow… … with the academics support… I was definitely less stressed at the end!” What was evident within these narratives was when the learner was given a particular task, and oriented to the context; the learners were able to ‘project’ fidelity onto the simulation scenario. Hamstra et al. (2014) call this functional fidelity and assert that this is key to overall believability. Academics were also keen to maintain an appropriate level of realism, and this was maintained in the way that they attended to the organisational flow. One stated: “it is really useful to have SimMan
who really brings the scenario to life… it brings out additional challenges for us, as we have to maintain a realistic patient case, manage the technology and our presence and dialogue… and ensure that it all flows realistically!" [E5].

Turning to the factors that have impacted upon student learning, E2 suggested that: “Historically students have felt pressurised about how to do a simulation. But when there is somebody in the room who is facilitating… it does make a positive difference. Our role is to support, find encouragement during the facilitation and give them [students] cues and positive feedback that they can take forward. That’s what enhances the students’ learning experience. When I think to when we are not in the room… that is… one of the reasons some students in the past have said they haven’t enjoyed it and they’ve not felt the benefit”. This was further supported by E5, who concluded: “I guess when we’re not in the room to actually support them… they don’t respond well to that”. These academic narratives suggest that they were supporting the students during simulation with timely prompts and feedback when they were in the practical room, resulting in the perceived positive experiences and promoting scaffolding within learning. However, their comments that the students did not respond well when the academics were outside the room were in stark contrast to the earlier reported interpretation of the students themselves.

Indeed, when comparing facilitation from inside and outside the practical room the responses were very different, leading to some ambiguity around the decision-making to stay in the room, and the impact upon student learning. For instance, the majority of the students were able to articulate and verbalise the impact of the academics’ facilitation upon their learning even when the academic remained
outside of the practical room: “Simulation has been really useful today, because it was like a real clinical situation, where we haven’t got a lecturer in the room and we can just do the job and work together…” [FG1 – S4]. This was supported by S3: “Yes, because when we did it last time, he [the academic] was in the room and I said I was better for him not being in the room this time” [S3]. These were final year students [C8] and appeared to be expressing self-confidence and a willingness to take leadership within the scenario even more so than when the academic was in the room.

The findings from the student data appeared to reveal that a positive learning experience occurred whether the academic was inside or outside of the simulated environment; in that sense, this would suggest that the rationale for remaining in the room requires addressing. The academic is responsible for delivering the ‘patient’ voice even when outside the room and it is the timeliness of these factors and clinical cues that appear significant to the students, more so than the academics’ actual presence, and would still constitute an element of facilitation (Fritz et al., 2007). Indeed, Campbell and Daley (2012) suggest that cues, support and clinical pointers offered during a scenario are features that academics typically recognise as adding value in the smooth flow, and would serve to provide realistic clinical information in a timely manner. However, these students were able to demonstrate collaborative scaffolding even in the absence of the academic.

Furthermore, these students were suggesting the ability for a strong base of effective reflection, evaluation of their performance and self-analysis. There was also evidence of commitment to improve; these are considered to be good values
and examples of accurate self-assessment ability and critical-judgment development (Cato and Murray, 2010). These are essential skills of the developing student nurse and indicators for effective impact within practice (Carlson, et al., 2005; Colthart et al., 2008). Adult learners are to some extent capable of evaluating their own skills and analysing performance (Baumgartner, 2003). A 2008 review of the effectiveness of self-assessment on the identification of learner needs, learner activity and impact on clinical practice indicated that self-assessment can be enhanced with feedback and by providing explicit assessment criteria (Colthart et al., 2008). This is highly relevant for those involved in designing and delivering simulation-based activities. Increasing the learner’s awareness of the standards to be achieved appears to improve the accuracy of the self-assessment, for example adherence to evidence-based guidelines (Ostergaard and Rosenberg, 2013).

The findings from the students support the impact of perceived growth in confidence within the area of team-working skills and leadership development over time: “I really had to think a lot, and was challenged in a way I don’t think I have been before… … it was really useful to have a team to work with” [FG1 – S4]. The student was referring at this point to undertaking the complete management of a patient case and leading a group of fellow students through a full patient assessment. Overall, across the student participants, the majority reported that the facilitative style of the academic during simulation had led to valuable experiences. It did appear that the academics were achieving much more than they gave themselves credit for when they remained outside of the room, and the students positively received this. Hamstra et al. (2014) concede that for the development of teamwork and communication skills, i.e. where there is
high learner interaction, simulation as an educational tool could prove to be of great importance. Further, a systematic review and meta-analysis concluded that simulation-based training compared with no intervention in health professionals’ education produced positive effects on knowledge, skills and behaviours (Cook et al., 2011), areas these academics were striving to impact upon.

**Faculty Development**

In order to promote the flow of good facilitation within the simulation event, the academic group turned their focus to their need to use the resources, and importantly the given technology, appropriately. E5 stated: “We have to be mindful of what we’re trying to create within the scenario… I think getting the technology right is important. If the technology isn’t right, it will be your biggest hindrance to enhancing learning. Whilst I may think it’s a fabulous piece of equipment, the more technology you’ve got in there… the more could go wrong with it and…” This dialogue was interrupted by E3, who added: “…you have to be very careful about using technology just because it’s there. They can do fabulous things you know… but it’s very expensive… and I’m not sure anyone has really got the control and ideas perfect yet… there are lots of kit issues… that stop the scenarios in mid-flow and this is really disappointing.” In this academic group, getting to grips with the new technology did appear to be a concern; furthermore, when education for simulation did commence, it was to manage the technology rather than the ‘new’ dynamic learning environment.

Starkweather and Kardong-Edgren (2008) support this they found that simulation was often introduced before staff training had occurred. This perhaps supports the hypothesis that academic staff are reluctant to get involved within simulation due
to the additional demands upon their teaching delivery utilising such a highly technical environment (Bland et al., 2011; Wilson and Klein, 2012). Introduction and familiarisation with the technological resources has to be overcome in order to establish an academic team capable of good facilitation (Day-black and Watties-Daniels, 2006).

When the academic participants were asked how they had been prepared for the facilitative role, they responded: “We sort of have a team approach... we get those together who showed initial interest when we got the equipment... and we’ve thought how to make it easier... as the SimMan can be quite static. And then we are trying to teach the new academic members as well as the students as we go along” [E1]. E2 furthered this discussion: “But that teaching focus was typically to do with the kit – the technical side, and not the learning process or experience, like how to actually facilitate within the simulation activity itself...” In probing a little deeper to uncover the specifics of preparation, it emerged that this academic had one workshop of approximately two hours to explore the totality of simulation pedagogy, concluding that: “We’re coming through the learning process now, and the more we do it...hopefully the better we become...but we were really underprepared for this” [E3]. The academics were able to acknowledge their on going learning within their teaching group, taking the opportunity to further their own facilitative skills and simultaneously enhancing the learning process and experience for the students. Although concerns were raised regarding their lack of educational preparedness, the student narratives reported that simulation-based learning was good, brought about by the facilitation from the academics. Indeed, the learning that occurs through the facilitation of simulation is where the students reported greatest satisfaction, an aspect that Smith and
Roehrs (2009) and Kable et al. (2013) report as lying at the heart of the teaching-learning encounter.

For the academic group, ‘good facilitation’ emerged from the narratives as a key objective, which is the ability to maintain the flow and progression within the simulation – they reported feeling ‘really pleased’ when this was achieved. Brockbank and McGill (2000) highlight that the principle aim of the facilitative process for the academic is to enable collaboration, open dialogue, and critical challenge, whilst maintaining the integrity of the subject specialism. The requirement of academic skill and expertise in facilitation has been described in several studies (Bland et al., 2011; Wilson and Klein, 2012; Arthur et al., 2013; Kable et al., 2013); however, there is very little discussion about what constitutes ideal preparation for the role. What remains clear is that if facilitation is to work effectively, education of the academic is fundamental (Berragan, 2011).

This academic group were keen to share how they had gained some of their expertise externally. E3 commented: “I belong to a wider group… outside of the university… where I’m involved in teaching simulation. As a group we do discuss the best way to facilitate in a meaningful way and bring about learning from simulations…” E5 progressed this: “Yes, there are one or two who work in that way [external to the HEI]… and they have been a great asset to us all in developing our own practices of good facilitation and deeper understanding beyond our initial introduction… We also meet regularly as a simulation group to discuss our needs and support each other.”

Reflecting upon professional practice in this way is not new to educationalists or indeed the deliberation of significant learning events (Eraut, 2007); however, an
idea around ‘double praxis’ learning was emerging from this group, where both the student and academic simultaneously gain new knowledge and expertise from a shared experience. During facilitation the student participants were guided to undertake the process of self-reflection and exploration of alternatives, included using the findings, together with professional knowledge, to tackle new situations they may face within clinical practice, a notion described by Kluger and Van Dijk (2010) as ‘feed-forward’. At the same time, the academics were able to describe a process whereby they were reviewing their own role of facilitation during the event, reflecting upon how this impacted upon the students’ learning, and considering how to assimilate new knowledge into their future and further facilitation role within simulation; an example of reflecting both in and on action by both groups in a unique synergistic way (Dreyfus and Dreyfus, 1986).

Simulation-based pedagogy is still in its infancy and it continues to be driven by a minority academic population at a national level. As such, the way this particular academic group were pursuing familiarity within their facilitative role to assist students’ learning was positive with regards to enhancing good facilitation, deeper understanding and knowledge, and utilising the capacities of each other and their students (Windschitl, 2002; Eraut, 2007; Roberts and Greene, 2011). Indeed, the students were not only learning to act like a nurse, they were also learning to think like a nurse (Wotton et al., 2010).

The Challenge of the Debrief

Following the delivery of a simulation activity, the academic leading the session would deliver a formal debrief to the students. Whilst the debrief has been
recognised as a stand-alone design characteristic, it reportedly had great importance to learning for both the academic and student participants. It presents as an opportunity to explore the events that occurred through a discussion-style approach, it is a time when constructive reflection takes place.

*The challenge of the debrief* presented as an important category that has a significant impact upon the student learning experience (Saldana, 2012). E3 began describing the nature of the debrief: “*we always use the debrief afterwards to ensure that everyone has understood the scenario played out and gets the opportunity to discuss any points that arose from it… It also provides an opportunity for us as a academic team to gain feedback and insight into how effective the simulation has been in achieving our aim, we are still learning all the time!*”

This notion that this academic group were still learning was a repeated factor. For the students, one of the most important elements discussed was the ability to make mistakes and receive feedback on this, an aspect discussed in all groups. For example within FG3, S3 commented: “*I gain confidence from being able to make mistakes in simulation before I go into real practice areas and work with real patients… we get good feedback in the debrief after this… the lecturers guide us in that and it really makes me feel more confident in my practice.*” Supported by S1 [FG1]: “*if you’re going to make mistakes … you can make them here and it will be OK… it’s much better to do this here and learn from our mistakes… and the debrief is really great for exploring these afterwards.*”

It was interesting to note that the student discussions around feeling safe within simulation often linked to a perceived enhancement within their clinical practice.
This was furthered by S7: “here we can mistakes but in a safe environment”. “...And that’s important so that you will do it differently next time if the same situation was to arise again... especially in clinical practice!” [S6]. These are important times with regards to patient safety and ensuring that nurses are not only fit to practice (Amitai et al., 2000), but also have the skills and abilities to act with confidence in leadership roles once qualified (NMC 2010a and b). This was a strong theme with students sharing how they believed feeling safe within the learning environment could facilitate their own transference of skills and give them the confidence to tackle repeated and new situations they may face within clinical practice. This is a concept described by Kluger and Van Dijk (2010) as assimilation and the ability to implement information to take forward for their future learning (feed-forward). Indeed, Dieckmann et al. (2009) recognised how feeling safe within simulation has the potential to enhance practice. Whilst they do not elaborate on how such enhancement would occur, others have reported how reflection can be purposefully directed to help the learner build awareness, improve thinking, recognise patterns, and clarify relevancy of thought processes (Mayville, 2011; Levett-Jones, 2013).

A strong commonality with regards to the process was phrased as: “we sat down as a group after... and then we talked about what went well and what we missed out...” [FG3 – S3]. The academics expressed detail with regards to creating a safe environment; they described the idea of emotional detachment from the simulation before commencing the debriefing process. In closing the simulated scenario, the notion of metaphorical ‘room temperature’ was used graphically by an academic: “You need to be aware of the ‘temperature of the room’... some students get really emotionally involved... ... and we need to manage that...
allowing time for the dust to settle... especially before beginning the debrief...” [E4]. There was general agreement to this statement, and some overlapping conversations were heard. “Yes, quite a lot of the students are quite stressed at the end of it and need a moment or two for personal thought before being moved onto the debrief...”[E5]. “… It’s important to give them a few minutes as you can see they are still engaged within the scenario... and they don’t want to let the patient [simulation manikin] go!” It was important for the academic group to ensure the termination of the actual scenario was clearly delineated before switching environmental contexts to one more conducive for a debrief, e.g. sitting down, allowing a few moments for personal thought before beginning a more formal reflective process.

The notion of the reported sense of ‘room temperature’ and ‘letting the dust settle’ in order to gain focus from the students was a tactic used to gain engagement and readiness for an individual and group debrief experience. Evidence supports this in so far as creating an atmosphere in which student participation within the debrief can thrive (Wickers, 2010). Indeed, Wickers (2010) suggests that a successful debrief is one in which the participants do most of the talking, where the facilitator’s role is to structure a seemingly unstructured learning event in which the emergent challenges are discussed.

The academic group were able to articulate several examples within their approach that they reported to have utilised well during the debrief. E3 began expressing thoughts around this by stating: “a good debrief... is when we work on the basis that we try and... talk about a quarter of the time... and the student group talks the rest of the time... which is the majority of it...” This was supported
by E5: “yes, if I come out of the debrief thinking that I’ve been talking too much… well, I don’t think it’s been a good debrief! It’s much more of a conversation. The students can get to make critical decisions… through questioning what it is that they did and why, through peer led discussions”. Debriefing itself has much significance to enhancing student learning from the actual simulation event (Dreifuerst, 2009), and these narratives appeared to share within this.

The academics were acting predominantly as a catalyst through which the reflection could occur. This was further corroborated, with E3 adding: “I think it’s going really well when I pose a question and then just move my chair back… then it gets taken up by someone else… I think this is particularly good because that’s when the group really start to engage and take ownership… really starting to self-reflect and reason the whole case through… how they worked together and managed the case… what they could have done differently… in a fluent, conversational way.” There is some expert agreement that the debriefing should include a discussion of both the overall process and of the learner’s individual performance as they relate to predefined objectives as necessary. With an opportunity for self-reflection with the goal of transferring the experience to practice (Dreifurst, 2009; Arafah et al., 2010; and Mayville, 2011), letting ownership and engagement occur and flow in this way, was suggestive of attaining articulation of actions and processes.

Students were able to detail the significance that the debrief held for them: “I learned more in the simulation today… especially during the debrief… about what to do for a patient with chest pain than I learned in my last placement” [FG2 – S6].

This was further illustrated in narratives from FG1 as the group shared how
learning from the debrief promotes further learning through critical reflection, S3 commented that: “It was only when we sat down as a group to discuss the events within the debrief that we realised what hadn’t gone well”. In support, S2 added: “I was just thinking the same really… talking it through gets you familiar with what is needed,”

Many of the students were keen to offer their own comments to this, with S3 concluding: “Yes, we do think, well actually last time we didn’t do this … so you’ll remember to do it the next time when the situation occurs… anywhere!” Whatever the role of the students within the scenario, they were able to describe their role within the learning community, and in the debrief they were able to construct knowledge purposefully for their future and further practice. Reflection within the debrief does reinforce an essential advantage that simulation has over clinical practice, that is, the opportunity to level learning challenges to the ability of the student, in a manner where they can feel safe not only during their practice (Campbell and Daley, 2013; Aldridge and Wanless, 2012) but openness following their practice within a facilitated debrief (Wickers, 2010).

Furthermore, the debrief appeared to be enabling the process of moving collaboratively through challenging situations to a level of advancement in practice (McIntosh et al., 2013). Within the creation of their own learning the notion of the mirror was strong, it was considered to bring positive elements to the debrief. It held particular significance to the facilitation through critical reflection of the impact of the students existing skills within the simulated practice itself. Furthermore, in developing their new self-confidence further and considering how this may impact upon future clinical skills assimilation the notion of windowing was
Reportedly, the re-examination of the clinical encounter in this way facilitates the development of clinical reasoning and judgment skills through the consolidation and reflective process utilised (Mariani et al., 2013).

Whilst this academic team were working together towards developing a consistent and meaningful approach to the debrief, the importance of student participation and articulation of the learning that occurred did emerge. Within FG1, S6 commented: “The simulation was confidence boosting… it made me realise what skills I have got!” S4 contributed to this by adding: “it was very useful [the debrief]… you have time to reflect, then, the things that you didn’t ask in the scenario can be covered…” The facilitator added: “Did you feel you did a good job [in instigating appropriate care for the patient] within the simulation during the discussion?” “I did yeah” [S3]. To which S4 added: “I think I felt it better than before… you know… you wouldn’t know what you’d done wrong or what skills were needed and things like that if you didn’t discuss it afterwards… and I’m definitely improving!” Dreifuerst (2009) purports that it is through the re-examination of the simulation encounter that mastery within learning can be achieved. Throughout the data analysis there was clear evidence to support these claims.

Structure to the debrief for this academic group came from navigating the student through a systematic clinical reasoning framework. “We encourage them to use a clinical reasoning framework to undertake this… and they really are demonstrating a good grasp of applying this… and especially how it enables them to explore alternative routes they could… and maybe should… have taken.” [E4]. Hence, whilst the academic participants appeared to have a tentative structure to
the application of the debrief, elements of accomplished practice were evidenced (McIntosh et al., 2013). From the academic perspective, facilitation was considered positive when they supported the students to develop their own thinking and solutions together through self-reflection and the utilisation of a clinical reasoning framework to focus their thoughts (Wickers, 2010; Levett-Jones, 2013), whilst ensuring much of the verbal dialogue was student-led.

A positive debrief was not always reported by the student participants. For instance, S5 [FG2] commented: “We did some interventions, and I’m not sure if we were right or not and I don’t think we knew why we did it… but we did stuff anyway!” Supported by S7 who added: “Exactly, sometimes we don’t know if we explained the right principle to the patient, what we had done, we don’t actually know if it was right or not… we’re not always told and I think that prevents us learning. For instance I still wouldn’t know what to do next time!” These comments appeared to be expressed within a context of lacking understanding for some of the care interventions the students made, and their appropriateness during the simulation event itself, and had a tone of dissatisfaction. Indeed, advocates of learning through the debrief stress the importance of exploring all elements through reflection to ensure understanding is achieved (Wickers, 2010; Levett-Jones and Lapkin, 2014), and this presented an example where this had not been achieved. These two cases offered a degree of validity to the developing model in so far as the essential role the debrief plays in cementing preparedness for clinical practice. Furthermore, in the move towards transference to clinical practice the importance of discussing self-confidence, perception of self-efficacy and clinical reasoning within the debrief are illuminated. In the main, whilst there were several accounts of constructive feedback being given during the debrief the
actual structure, the content and flow differed on occasion and it was here where these particular students perceived a lack of opportunity to assess their own performance and consider how they could improve upon their practice (Kogan et al., 2012).

It would appear from the narratives that there were several different academic examples for the style and structure of debrief, which included: (i) reflecting upon the process, (ii) identifying the negatives and positives within the performance, (iii) having the scenario narrated back to the students, (iv) utilising a specific framework – for example a clinical reasoning tool. Whilst variations of this kind have been described in the literature, it is reported to significantly enhance the student learning experience if consistency within the academic team exists (Dieckmann et al., 2009; Wickers, 2010; Levett-Jones et al., 2013).

**Theme Summary**

In drawing from the findings within the emergent categories of ‘the fundamentals of facilitating simulation’ and ‘the challenge of the debrief’, a conceptual framework has been proposed to map and contextualise the findings within this theme. The data analysis has revealed how approaches within the simulation process impact upon the learning experiences of student nurses and these can be encapsulated within the notion of *preparedness for clinical practice*. Within preparedness for clinical practice, five key elements of the simulation process can be said to exist: ‘constructive integration’, ‘design characteristics’, ‘good facilitation’, ‘debrief’ and ‘academic development’. For preparedness to occur, the skills and knowledge involved in the process would need to be frequently and
regularly revisited (Dreyfus and Dreyfus, 1986), ideally through integration throughout the curriculum.

![Diagram of Preparedness for Clinical Practice]

**Figure 4.3 A Synthesis of Preparedness for Clinical Practice**

This study found that revisiting was enabled through both previous practical and theoretical experience, coupled with facilitated-reflection (Kolb, 1984). To conceptualise these findings, an outer layer has been added to the developing model (Figure 4.3). The elements detailed can be considered to be simultaneous activities that are *constructively integrated*, and they represent the notion of the transformation from novice to expert nurse. It is through the implementation of the *design characteristics* that *good facilitation* can be achieved. Both the academics’ and the students’ self-reflections enabled the review of the significant events which typically occurred within the *debrief* and was often in the form of a
learning conversation, where an open, collaborative and supportive setting was engendered (Levett-Jones and Lapkin, 2014). With regards to Faculty development, uniquely, this presented an element of double-praxis learning that both the academics and student groups engaged within. Furthermore, the academics reported how they were regularly reviewing their own role within facilitation, but simultaneously reflecting upon how their role impacted upon the students’ learning during the event.

IV. Theme 3: Evidence for the transference of skills, acquired through simulation-based nurse education, to the reality of clinical practice.

One of the areas that this research sought to explore was the nature of the evidence that exists supporting the transference of skills, knowledge and clinical reasoning gained through simulation into the reality of clinical practice. Within this final theme, three broad categories emerged and included clustering’s around ‘rehearsal and preparation for practice’, ‘fidelity’, ‘theory-practice links’, and increases in ‘confidence’ and ‘leadership’ for practice (Saldana, 2012). The three categories, which held significance as to the factors that may potentiate how the skills gained within simulation could be transferred into clinical practice, are:

- Furthering the essential skills of the nurse
- The role of realism
- Assimilating knowledge and skills for nursing practice
<table>
<thead>
<tr>
<th>Category</th>
<th>Grouped Comments from Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Furthering the Essential Skills of the Nurse</td>
<td>Patient Safety, Individual KSA acquisition, Leadership, Confidence, Clinical Judgement/Reasoning</td>
</tr>
<tr>
<td>The Role of Realism</td>
<td>Realism/Fidelity, Structural/Functional, Immersion, Role-Play</td>
</tr>
<tr>
<td>Assimilating Knowledge and Skills for Nursing Practice</td>
<td>Case/Placement-based, Patient Actors/Simulated Patients, Theory-Practice Link</td>
</tr>
</tbody>
</table>

Table 4 - the evidence for the transference of skills, acquired through simulation-based nurse education, to the reality of clinical practice.

Furthering the essential skills of the nurse

*Furthering the essential skills of the nurse* was an emergent category within this theme (Saldana, 2012). The data analysis sought to explicate and synthesise the evidence surrounding the development of these skills, which includes knowledge gains, attitudinal change, confidence growth and clinical reasoning abilities. The growth in personal skills acquisition and confidence to practice were often linked to the notion that the ‘patient’ was safe and the knowledge that no harm could occur within the learning environment. For instance, [FG2] S4 stated: “*it’s like when you’re working on a case, things just pop into your head, and it’s like, knowing that this patient [simulated] isn’t going to get injured if you’ve made a wrong decision. I think this is why it’s such a confidence booster to go in and think, ‘well, actually yes, I did do that right.’ Because I think, sometimes, in*”
situations in a ward, you kind of step back and think ‘Oh God, I can’t do anything’. I just feel sometimes I’ve just not got the skills to be a nurse...” S6 furthered and developed upon this with a personal reflection: “... it made me realise what skills I have got. What I do know... Almost without thinking... I must know it well enough to not think about it... I can do this in practice...”

These examples were demonstrative of the students articulating their developing self-confidence and self-efficacy through their perceived ability to perform similarly within a practice setting. There was also a suggestion of autonomy, with the growing expertise and not needing to purposefully think about the skills. Leigh (2008) supports this style of reflection as a move towards autonomy, and furthers that professional confidence is formed by knowledge, theory and the ability to think critically. Within the study undertaken by Bambini et al. (2009), self-efficacy was reported to be increased following simulation experiences, and this would appear to be the case for these students; their narratives offered insight into how well they felt prepared to successfully accomplish the given task.

Expressions around confidence and the application of knowledge and theory were made within both FG2 and FG3; S7 – FG2 in response to the facilitator question: “How do you think the simulation experience has helped learning to become a nurse?” S5 responded: “I think it doesn’t help us so much with new learning but it helps us build the confidence of what learning we’ve already got. But it really helps us in building up confidence to improve on our clinical decision making in readiness for practice”. This was expanded upon further by S3, who added: “In our scenario, it was trusting your own judgement. I mean, that’s confidence, I think. We’re actually right. We’re on the right track. Even though we knew this
guy was not real... when we saw his blood pressure dropping, he became a deteriorating patient in front of our eyes and we had the confidence and knowledge to deal with that... just like a real clinical situation... we had to think on our feet.” This growth in reported confidence, application of existing knowledge and drawing out critical thinking skills were by far the most evidenced strengths of simulation arising from the student groups. The importance of a safe environment was a significant factor too for the development of these attributes.

To further the acquisition and application of the essential skills of the nurse, E3 commented: “We try as much as possible to align experiences within simulation to placement areas... we try to create a certain environment and then hopefully they are best prepared for the practice allocation that follows...” This was supported by E5: “It’s not always possible as there are never any guarantees they’ll see what we practise and rehearse for... however, that’s the way the modules are structured... to provide that step-gap...the rehearsal for practice... so to speak with the opportunity to become acquainted with the relevant skills for the next placement.” This was an interesting approach and one that was shared among the academics; further, it is an element that would be congruent with the integration of simulation sessions throughout the curriculum.

Leigh (2008) asserts that once a position of confidence is reached nursing students ‘must’ apply what they have learned to clinical situations as soon as possible for maximum impact. In aligning simulation activities to the specific placement area that would follow within the curriculum [C12], the academics were displaying a level of mindfulness towards the bridging of theory to practice, with heightened transference possibilities, through the timely rehearsal and scheduling
of simulation experiences. Whilst not overtly verbalising the notion of ‘maximum impact’ described by Leigh (2008), it certainly would appear that this was a key aim for the academics.

**Self Confidence**

Confidence growth was described within all of the student focus groups. Some of the more junior student nurses [C12] offered statements not just around confidence, but having more courage and self-belief [FG3]; S2 described: “it was good to do the simulated practice in theory time, instead of just being out on placement straight away because I think in placement, I would just go and get someone more senior to deal with the patient situation… it gave me the confidence to at least attempt to try and give the patient the information they were asking for. I believed in myself that I had the confidence that I can do it in placement too…” Similar thoughts were shared by S5: “I was self-conscious last time we did simulation and I didn’t want to delegate any tasks to others… today I was able to act more like a leader… probably what I will be expected to do when I qualify… it really gave me the courage to act in a more senior role” [FG1-S5].

Whilst leadership is an essential skill for the qualified nurse, even at a junior level, the student participants were making links to the impact of growing their confidence, positive attitude and how this impacts upon their decision-making and leadership qualities. This is typical curriculum content for the previous cohorts [C08] that would not ordinarily appear until much later within the undergraduate nursing programme (year 3). Indeed, these first year students were assimilating the knowledge and skills needed to work as a qualified nurse and make relationships as to how the simulation was furthering their confidence in their
ability to undertake such roles (Bambini et al., 2009; Smith and Roehrs, 2009; Levett-Jones, 2013). Their self-efficacy – their belief in their own capacity to undertake the role of the nurse in clinical practice – was validated by the assessments of their performances by the academic both during the simulation and during the debrief. These findings were triangulated by the majority of the students themselves, who were able to articulate the processes needed to instil self-efficacy in preparedness for their future role, and enhancing the belief within their attitude that they would be able to transfer these to the real clinical world (Hyland and Hawkins, 2009).

The students were able to detail previous simulated experiences where they received feedback from a patient actor and they were able to articulate the impact that this had upon developing their essential skills and how they would hope to transfer these to future clinical practice [FG3]. S3 verbalised: “I learnt what words to say and what not to say. The actors were able to give specific feedback on what I actually said, ‘you shouldn’t say that because it made me more anxious…’ etcetera. This was much more useful and personal to me because they reacted differently with everyone, as they reacted purely on what was said to them, and the way it was said, more so…just as a patient would, and not a tutor”. S1 shared this: “personally it was good for me because if you said you were sat with your arms folded, or you looked unapproachable, I could work on that… or they said ‘you didn’t give me eye contact’… so, as long as I could change my way, the way I sat, the way I made eye contact, then I can change that in the future… it was very useful”. “Yes, I think this is the best feedback possible… patient actors really help us to prepare for clinical practice placements” [S3]. Similarly, the academics were able to share how they felt this enabled their facilitative skills further, as E5
put it: “I really enjoyed listening to the patient actors giving feedback to the students… they were very honest and had a big impact on the students learning…” “Oh my goodness yes!” E4 continued: “You could see on the faces of the students… really reflecting on their comments…”

The engagement of the patient actors within the debriefing is an aspect that has not been explored in the simulation literature. However, it did appear to bring richness and unique insights into performances within the simulated events in this study that both students and academics valued. E4 concluded: “It was great to hear the way that they gave feedback to the students… who were so early into their training… the language they used was in lay-man’s terms… and that really brought something additional to the debrief… it certainly is something that I would encourage again…”

This presents itself as an important area for further study. Service users and carers (and the general public) are integral to student nurse education and their impact has been detailed in various publications (Frankham, 2009; Morrow et al., 2011; Staley, 2013); however, their contribution within student feedback, specifically for simulated events, is largely unexplored. Pauly-O’Neill and Prion (2013) detail a study where standardised patients (people trained to accurately portray a specific patient) were used to improve medication administration skills in the paediatric population; whilst they were used as a method for teaching and evaluating nursing clinical performance by academics, they did not contribute directly to the feedback the students received (Kogan et al., 2012). In other research studies where standardised patients have been used, students have evaluated their experiences as challenging, realistic and of value to the
programme (Whitaker-Ebbert and Connors, 2004; Rutherford-Hemming and Jennrich, 2013); again the opportunity to engage them further during the debrief was not taken within these studies.

**The Role of Realism**

*The role of realism* on the increased likelihood of establishing transference of skills to clinical practice was a second emergent category within this theme. Interestingly, it was the academic group who expressed initial ideas regarding the link between the attainment of reality and immersion within simulation and the outcome of transference and competence; E3 stated: “the simulation has got to be as real as it possibly can be… the students need to feel attached… It’s a big barrier that they are actually talking to a manikin and not a real person… once you can get them to do that, and they immerse themselves fully in the situation and context, then actually, you can tell that their responses and applications are a whole lot better…” “Yes, I agree, it’s like making sure the documentation, equipment and fluids are all the same [as in clinical practice]… that way they become familiar with the task… and that’s what builds their confidence, engagement and ability to transfer their skills to practice…” [E5].

There seems to be other factors detailed within this dialogue that held importance to the realism maintained. Gaining engagement of the student related to the manikin functions being believable, and having the necessary documentation and equipment available that would be expected within the clinical placement areas relevant to the patient case. It would suggest a crossing over of knowledge gained from practice back to the classroom and vice versa, in order that the student can
gain familiarity with the scenario and inherent tasks. This can be related to the notion of contextual appreciation and understanding of the specific situation using realistic endeavours (Eraut, 2007).

The transference of skills gained within simulation is reported as being achieved through the enhancement of confidence and competence through repeated practice (Hyland and Hawkins, 2009; Ricketts, 2011). However, it is not quite as simple as this would suggest, and consideration needs to be made to wider factors (Eraut, 2007). To this end, the academics were keen to keep the context of the simulations real at both a structural (equipment etc.) and functional (scenario) level (Hamstra et al., 2014). Indeed, as the students progressed within simulated experiences, they reported how they were able to recognise patient deterioration, an element of functional fidelity for the academics. This required them to use their clinical judgement and decision-making skills (Hamstra et al., 2014), whilst embracing the specific context of the situation – that of an emergency, drawing on structural fidelity management for the academic team.

E4 asserted how the realism isn’t just about the manikin, but also the data that the students have available to them, and how this links to the impact the scenario will have upon the students. “… We give the students very realistic scenarios… in that… how often in clinical practice are you confronted with somebody who’s clearly not well and you don’t have a lot of data to work with? So I really like that this keeps it real. And they are forced to deal with the information they have and work through it… even when its unfamiliar and the patient situation is deteriorating fast… just as it would be in practice” [E4]. E3 made specific links to the realities of practice for these senior students. “It isn’t an ideal or tidy world is it? Because
you can have this kind of ‘messiness’ and actually, you know, these students are only one month away from qualifying and many are going to go into placements where a deteriorating patient can be… actually that’s in any area, and they need to know what they’re looking at…it really draws on their clinical reasoning ability”

There was some overlapping conversation at this point; this dialogue appeared to generate many emotions from the group, with E1 continuing: “Such patients do actually die because something has been missed. And I really enjoy the challenge that this kind of scenario poses… because I think that’s realism… and deteriorating patients are the ones that nurses walk past and so it just might make them think – maybe it’s more about the impact such a scenario will have…and that’s what will ensure that they remember it!”

Such scenarios, described in this way, have the potential to be very powerful learning tools. This academic group concluded with the point that it is only through having simulation available throughout the curriculum that they now have the ability to deliver realistic complex care cases driven from within clinical practice. These expressions align to the necessity of the student to demonstrate competence through critically deciding what needs to be done through their clinical reasoning abilities (Carlson, et al., 2005; Morgan, 2006; Eraut, 2007); furthering this, the notion of ‘messiness’ detailed above, where a case is unpredictable aligns to what Benner et al. (2010, p136) describes as ‘cue sensitivity’. Benner et al. (2010) develops an argument that sufficient cue sensitivity within the nurse will enable the detection of a change in a patient’s condition. By comparison the ‘indifferent detached nurse’ would not be alert to subtle patient changes that may occur within such deterioration, a dire potential situation described by E1 above.
Whilst the academic participants related reality to engagement, immersion and impact, for the students there was some sense of anxiety within their experiences, especially at the introduction, which was by contrast exacerbated by a perceived lack of realism. FG1 - S3 commented: “It didn’t feel like it was real because there were no facial expressions on the manikin… I wasn’t enthusiastic at all to begin with… I tried not to think too much about the facilitator… who was putting a voice through the manikin”. This was an interesting comment shared by one of the students in the newer curriculum [C12-S1] where patient actors had been on several occasions previously. The students from this group talked about role-play within simulation and how this led to anticipation or a sense of dread and raised their anxiety levels [FG3].

From an academic perspective they considered that they were not using role-play; rather, they were aiming for ‘real’ clinical experiences that are aligned to the actual clinical role of the student. Either way, this anxiety led to a difficulty to suspend disbelief, seemingly due to a lack of functional fidelity within the manikin (Hamstra et al., 2014). E4 shared how the academics were attempting to engage the students through ever more realistic practices: “I think the days of role play when you were trying to play a role that you were not…have long gone. We used to say… like ‘you’re the doctor, you’re the nurse etc.’… do you know what I mean? It was very hard… they were put in a strange environment with an unfamiliar role. We don’t do that anymore, they play what they are and where they are… in terms of the patient and the ward… and that works much better”. E4 further added: “yes, then we brief them, ‘you’re not doing role-play we want you to behave and act exactly as you would in clinical practice’ … that seems to reduce their anxiety too...”
Through these narratives evidence was gained that the academic group strived to establish and maintain realism in both student role and behaviour, in the belief that this would have greater impact upon the learning experience. Indeed, accomplishment within a given task is a notion supported within the work of Benner (1984); she makes distinctions between the five levels of competency, differentiation between which is determined by the student nurses’ focus of attention, involvement in the situation, and perception of responsibility. Hence, if the scenario is not believable, the student would become detached, lack focus and relinquish responsibility within the learning situation (Waldner and Olson, 2007). Within this study, the academics detailed alignment and congruence within the learning outcomes, and were also able to articulate the evidence that they had witnessed the students’ self-efficacy and clinical reasoning skills even if there was a reluctance to engage within role-play. E3 emphasised: “…all the students take something positive out of the actual learning experience…Although they may have been anxious of the role-play at times… they valued it and they learnt from it”. “It taught them two important things, what they didn’t know and more importantly, what they did know when they worked together. Those are the evaluations that have come across consistently for the past two to three years…and we see them come back from practice and they are able to report how useful what they learnt with us was to their practice placement.” [E4].

Whilst transference to clinical practice was verbalised by both the academics and students and is high on the simulation agenda, there remains a paucity of evidence as to how the student learning and capabilities, beyond reports of confidence growth, will actually be put into place importantly meet the expectations of their qualified team members.
Assimilating Knowledge, Skills and attitudes into Nursing Practice

Assimilating knowledge, skills and attitudes into nursing practice was the final category within this theme. Working within a simulation-based pedagogy, academics frequently reported the importance in preparing students to perform in real clinical settings. Anecdotal reporting from students demonstrated how they had successfully utilised the knowledge, skills and attitudes they had gained through simulation experiences within the practice setting. One academic stated: “Students often come back into school [university HEI] and tell us how useful a particular simulation practice has been… I’m not really aware of real research evidence as to transfer [of KSA] into practice, but the students certainly report that it has increased their confidence and ability in managing care” [E4]. E5 supported this: “certainly from my point of view, when I’ve used high fidelity simulation in my module this is followed with placements in acute and critical care areas, where they really value the experience they’ve had [in simulation]… and they can easily give me examples of how the experiences they gained [in simulation] enabled them to work with confidence in particular situations… with particular cases and having confidence in using their clinical decision making skills.” E3 added: “You can certainly believe that it is the simulation that has helped them get prepared for a particular placement, but I also think we can see quite clearly as they progress through the years that they get much more confident, competent and efficient at all of the complex tasks involved within providing care”.

The academics were very clear in articulating their belief in the evidence of student anecdotes to support the transference of knowledge, skills and attitudes
gained into clinical practice. Indeed, they were able to give several examples relating to students’ assertions towards self-belief of enhanced confidence and self-efficacy in clinical practice. The use of such anecdotes from students has been reported in the literature, although there remains a paucity of evidence as to the measurement of such transference contributing to enhanced patient care and outcomes (Levett-Jones and Lapkin, 2014). Whilst many researchers remain unconvinced that the effectiveness of simulation outweighs the cost and resource implications (Starkweather and Kardong-Edgren, 2008; Leigh, 2008; Bambini et al., 2009) and the evidence for its effective transference remains relatively weak (Jeffries and Rizzolo, 2007; Scherer et al., 2007), one element that appears to convince many of its usefulness is the over-whelming reports of its success in preparing students to act with confidence within clinical practice (Morgan, 2006; Berragan, 2011; Kable et al., 2013). The findings of this study, in the form of reported student anecdotes, would also add to this body of knowledge.

**Self-Efficacy**

Students in FG2 were able to articulate how their learning experiences within simulation impacted upon their confidence in dealing with events they had never actually witnessed in clinical practice. For instance, S4 stated: “With the skills that you learn in university, you can go on to clinical placement and never see them. So you’ve got no experience of someone having a cardiac arrest for example…” supported by S3 who interrupted with: “I’ve never seen one as a student nurse…” S4 continued: “this is what I’m saying, at least by having the simulation, that gives you the confidence that if you ever did come across a situation like that, you’d know what to do, but on the other hand you may never get the chance to practice the skills because the situation just doesn’t come up in practice”. Whilst the
student participants were valuing simulation as a tool that enables them to consider how they might practice when faced with a future event – supporting the notion of windowing, they were also considering how they might use these in the future. Throughout this dialogue it appeared that their self-efficacy was enhanced. Furthermore, confidence growth was evident in terms of preparedness to manage a situation unseen, but rehearsed for within a simulated experience. In the work of Dreyfus and Dreyfus (1986) the approach to new experiences is captured within the facilitated progression, which emphasises how informal learning from experience of this nature contributes to acquiring tacit knowledge, and would validate the conditions under which the student is able to work competently within the practice setting, for example, reducing the degree of supervision required.

In the academic group, E2 commented on the way that pauses were being used within the simulation, seemingly relating this to an advanced level within the scope of confidence and competence in practice: “Sometimes it looks like ‘not much is going on’, or they don’t seem to be actually doing much, but what I really like is the way they can be calm in the moment and stopping to think, you know, what could be going on? What else do I need? Exploring alternatives whilst in action…and it wasn’t rushed at all. There’s always so much to do in reality…and they can forget to think things through… I do believe that comes with experience… the ability to think a situation through and then act in a confident and competent way”. It became apparent that some of the academics were linking confidence and competence together; in reality, the two are quite distinctive. However, some have suggested that the thinking during simulation permits
students to bring previous experiences into their current situation (Dreifuerst, 2009; Hyland and Hawkins, 2009).

From an advancing student perspective, ‘time to think’ is one element that appears to enhance the preparation of students in readiness for clinical practice (Berragan, 2011; Kable et al., 2013). ‘Conscious deliberate planning’ aligns to the level of ‘competence’ in the Dreyfus and Dreyfus (1986) model of progression, which can be claimed to demonstrate a gradual replacement of deliberation by more tacit forms of cognition. On balance, both the students and academic participants were able to give several anecdotal examples that detailed quite specifically how simulation-based pedagogy had increased their confidence and self-efficacy within clinical practice. They were further able to describe how simulation had enhanced their competence and autonomy within clinical practice, supporting the notion of transferability as reported in some previous studies (Dreifuerst, 2009; Smith and Roehrs, 2009; Wilson and Klein, 2012).

The notion of developing their current practice through the concept of ‘mirroring’ was introduced by an academic member and resonated strongly as a term used to detail how students view their current level of practice. Likewise, the notion of ‘windowing’ was similarly introduced as a term given to detail how students were using their knowledge and practice-based skills to assess how they may perform in future practices. Specifically, the student participants described confidence in team working and collaborating to ‘try out’ new skills, knowledge and reasoning in clinical practice; furthered with the notion of peer-generated scaffold; these elements have not previously been described in the wider literature.
Discussion

One of the strongest measures of the effectiveness of simulation as an educational tool appears to lie within its impact upon preparing student nurses to a point of ‘readiness’ for clinical practice, brought about by the immediacy of requiring to use this skill within the practice area. Simulation is a method that is repeatedly claimed to have the ability to support the transference of skills learnt through classroom rehearsal into clinical practice (Dreifuerst, 2009; Hyland and Hawkins, 2009; Levett-Jones, 2013).

All participant groups unanimously believed that the simulated experiences prepared students to perform in real clinical settings. Specifically, the academics strived continually to ground their simulation-based sessions within the realities of contemporary clinical practice through a notion of clinical alignment. This is an aspect that has been considered to be essential to enhance critical thinking, clinical decision-making and clinical reasoning (Dreifuerst, 2009; Hyland and Hawkins, 2009). Indeed, these elements have been described as the milestone of professional development as the student nurse moves from being a novice to becoming an expert clinician (Benner et al, 2010; Levett-Jones, 2013).

The academics reported that not only did they strive to reduce anxiety and increase realism but also to ensure that scaffolding of learning experiences was apparent; they were able to articulate how the given activities were purposefully constructed to build towards student mastery and expertise, with a clear reduction in staff involvement and intervention over time, as student exposure and self-confidence within simulation progressed (Benner et al, 2010; Arthur et al., 2012). Developing on from the notion of mirroring, the significance of windowing within
simulation was also described. This related well to the students’ abilities to demonstrate self-confidence and to move forward to be more autonomous in trying out a new experience in clinical practice. Uniquely to this study, several students’ verbalised specific examples of how simulation had enhanced their self-confidence, clinical reasoning abilities and the utilisation of the knowledge, skill or attitude learnt, offering credence to assimilation and further support to the notion of transferability (Dreifuerst, 2009; Smith and Roehrs, 2009; Wilson and Klein, 2012). Indeed, critically reflecting drives assimilation and affirms self-efficacy (Kolb, 1986; Bambini et al., 2009). Levett-Jones (2013) supports and furthers such an approach within her work learning to think like a nurse, where a clinical reasoning process is described; she suggests that clinical errors are linked to poor reasoning skills within nurses.

From the study findings there was a tendency to assume that confidence and competence are transferable skills; to transfer learning through the assimilation opportunities that simulation provides. However, when examining how professionals learn, perhaps the real test of whether performance meets that, which is expected within clinical practice, is whether it meets the expectations of the workplace for which they are rehearsing. Eraut (2007) asserts that inherent within the notion of capability is the ability to do the right thing at the right time. Indeed, nursing has had much bad press recently due to the failure to collect, interpret and act on clinical data in an effective and timely manner (Willis, 2012; Francis Report, 2013).

To conclude, in drawing together the emergent categories of ‘furthering the essential skills of the nurse’, ‘the role of realism’ and ‘assimilating knowledge and
skills for nursing practice’ the conceptual framework has been further developed. The final phase, demonstrated within the outer ring serves to map and contextualise the findings within this theme (figure 4.4).

In the diagrammatic representation, the outer circle captures the six elements integral to this process: ‘clinical alignment’, ‘realism’, ‘self-confidence’, ‘self-efficacy’, ‘clinical reasoning’, and ‘assimilation’. This is drawn from the evidence revealed to make explicit the important connections for the transference to clinical practice.

![Figure 4.4 A Synthesis of The Transference to Clinical Practice](image)

All participant groups unanimously believed that the simulated experiences prepared students to perform in real clinical settings. Specifically, the academics
strived continually to ground their simulation-based sessions within the realities of contemporary clinical practice through a notion of *clinical alignment*. Furthermore, the academics reported that not only did they strive to reduce anxiety and increase *realism* but also to ensure that scaffolding of learning experiences was apparent; they were able to articulate how the given activities were purposefully constructed to build towards student mastery and expertise, with a clear reduction in staff involvement and intervention over time, as student exposure and self-confidence within simulation progressed (Benner et al., 2010; Arthur et al., 2012).

Developing on from the notion of mirroring, the significance of ‘*windowing*’ within simulation was also described. This related well to the students’ abilities to demonstrate *self-confidence* and to move forward to autonomously ‘try out’ a new skill in clinical practice. Uniquely to this study, several of the students verbalised specific examples of how simulation had *actually* enhanced their self-confidence, *clinical reasoning* abilities and the actual utilisation of the skill learnt within clinical practice, offering credence to assimilation and further support to the notion of transferability (Dreifuerst, 2009; Smith and Roehrs, 2009; Wilson and Klein, 2012). Indeed, critically reflecting and learning drives assimilation and affirms *self-efficacy* (Kolb, 1986; Bambini et al., 2009). Levett-Jones (2013) supports and furthers such an approach within her work *learning to think like a nurse*, where a clinical reasoning process is described; she suggests that clinical errors are linked to poor reasoning skills within nurses.

From the study findings there was a tendency to assume that confidence and competence are transferable skills; to transfer learning through the *assimilation*
opportunities that simulation provides. However, when examining how professionals learn, perhaps the ‘real’ test of whether performance meets that, which is expected within clinical practice, is whether it meets the expectations of the workplace for which they are rehearsing. The ideals proposed within the clinical reasoning process align well to a simulation-based pedagogy, where patient safety, rehearsal for practice, confidence, competence and self-efficacy development are essential requirements (NMC, 2010a and 2010b; Levett-Jones et al., 2010).

The concluding unique conceptual model presented also represents a synthesis from the whole of the data analysis of the processes for developing simulation practice in nurse education (DSPiNE). Indeed, the link between the two outer circles of preparedness for clinical practice and transference to clinical practice can be articulated as the bridge between theory – ‘preparedness’ – and practice – ‘transference’. The ideals proposed within the model align well to a simulation-based pedagogy, where patient safety, rehearsal for practice, confidence, competence and self-efficacy development is considered to be essential (NMC, 2010a and 2010b; Levett-Jones et al., 2010).

The final chapter will explore the contribution that this study makes to the existing body of knowledge about the effectiveness of simulation as an educational tool within nurse education. The limitations and weaknesses to this research will also be discussed. As a doctoral thesis the way in which the undertaking of this thesis has pushed my personal boundaries and the implications for professional practice will be consolidated.
CHAPTER FIVE

Summary of the study

In summary, the aim of this study was to explore and describe some of the characteristics that contribute to the effectiveness of simulation within nurse education. After selecting the topic and conducting a thorough review of the literature, notions of teaching and learning were clarified through a simulation-based pedagogy. The literature relating to models of integrating and designing simulation activities was considered; however, evidence that supports transference to the reality of clinical practice was scant.

An explorative, qualitative case-study approach facilitated the collection of spoken data from twenty-four participants, through the use of four planned focus groups, which were video recorded and transcribed. The student participants were undertaking undergraduate nurse training, and the academics involved were those involved in the delivery of simulation within the HEI setting. The qualitative paradigm allowed the depth of each participant’s feelings to be revealed through a detailed exploration, resulting in the collection of a large amount of data from the focus groups. The open discursive format of the groups encouraged participants to contribute. As such, the research approach and research tools were thought to be the most appropriate choices for data collection of this nature (Polit and Beck, 2014). The volume of data collected required considerable organisation and decisiveness. Creswell’s (2007) spiral analysis tool aided and deepened understanding of the participants’ views and was invaluable during data
categorisation, theme and category development as was the deductive themes drawn from the research questions.

One of the key purposes of this study was to produce a well-conducted, sound piece of research, which demonstrated a clear decision trail, and a good understanding of the research process in order to address the aim and research questions. Along the journey of data analysis a unique, systematic, conceptual model was developed named ‘Developing Simulation Practice in Nurse Education’ (DSPiNE). The model relates to two key processes derived both during and from simulation activities.

![Figure 4.5 The conceptual model of Developing Simulation Practice within Nurse Education (DSPiNE).](image-url)
Key Summary points from the DPSiNE conceptual model

The preparedness for clinical practice

This was described as the process whereby the student gains insight into their current practice abilities. The academics were able to detail how underpinning design characteristics enabled students to move from introductory skills to managing complex patient cases, through good facilitation and supportive reflection brought about within the debrief. Academic narratives embraced the notion of good facilitation, and they described the ability to make distinctions between the five levels of competency utilised within progressive scenarios (Benner, 1984; Dreyfus and Dreyfus, 1986), central to the model and penetrating all levels. Decisions made about the level of support provided within each scenario were based on balancing learner expertise and ability to self-reflect, in order that the learner could identify their own strengths and weaknesses whilst not becoming too overwhelmed with the situation (Benner, 2010; Wilson and Klein, 2012). The impact of visualisation and participation in moving students beyond simply knowing how to use their knowledge to address problems in real-life contexts was captured within the notion of mirroring. This was a term used to describe how students use simulation to look at current practice and through self-reflection and collaborative learning, identify their specific learning needs.

McIntosh et al. (2013) encapsulates the ability to command good facilitation within the notion of ‘accomplished facilitation’. They detail this as having two key themes, supporting alignment and appreciating the core skill of mental gymnastics. ‘Alignment’ relates to the flow through of the intended learning outcomes with the simulation experience and the debrief focus, along with the
academic contributions. They describe ‘mental gymnastics’ as a high-level skill requiring mastery of the basic techniques of facilitation, practice and a drive for continual improvement, which maps well to meta-cognition. Interestingly, they describe the notion of accomplished facilitation as the ability to move beyond the technical skills to pay attention to performance and fluidity (non-technical skills), functions attributed to the expert practitioner (Dreyfus and Dreyfus, 1986). The findings of this study suggested that accomplished facilitation could be achieved through student participation in student-academic learning conversations, and by belonging to a positive community of practice.

During the debrief, both groups reported upon the importance of considering how to assimilate new knowledge into their own future facilitative/practice role; this was considered to be an example of reflecting both in and on action by both groups in a synergistic way (Dreyfus and Dreyfus, 1986). Whilst the literature discusses the learning opportunities for students, the notion of inherent learning for the academic facilitating the simulation has not been explored, yet it is an aspect that this academic group aligned strongly to. Reflecting upon professional practice, as a form of development, is not new to educationalists; however, what was emerging within this study was a situation where both the student and academic simultaneously gained new knowledge and expertise from the shared experience and opened a pathway for ‘double-praxis’ synergistic learning, perhaps escalating facilitation skills beyond ‘good’ to ‘accomplished’ and pushing the paradigm of preparedness towards transference for the students.

The findings reported within this study were from one case study group, and whilst there remains no formal requirement or regulation to providing simulation
experiences (NMC, 2007b; Arthur et al., 2012; McIntosh et al., 2013) some standards have been produced (International Nursing Association for Clinical Simulation and Learning; INACSL, 2011), however, these are not universally integrated. The findings from this case study suggested that the academic team were mindful of how consistency and quality assurance measures within their approach as a community group improved their team performance (Lave and Wenger, 1991).

The transference to clinical practice

This was described as the process whereby the student gains insight into their future practice requirements. This was furthered as the student progressed through the opportunity to undertake the notion of windowing, the moment where a student realises they have the opportunity to consider and explore how their current experience could be applied, envisioning the future assimilation of their experience into clinical practice (Ricketts, 2011). Indeed, Wilson and Klein (2012) assert that developing a realistic clinical scenario narrative that the students could possibly encounter in actual nursing practice is the most motivating factor for students. Within this study, the timeliness of clinical alignment was also considered important; the closer the rehearsal was to the possibility of necessitating implementation of the skills and knowledge, the more likely the students were to recall them when needed in clinical practice. It was reported that in areas where fidelity was lacking, situation presented a barrier to students particularly regarding engagement within the clinical scenarios, a finding that has been reported in some very recent studies (Hamstra et al., 2014; Levett-Jones and Lapkin, 2014).
Teamwork, realism, scaffolding and hands-on learning were characteristics the academics identified as important when striving for effective simulation. In advancing their practice, the students reported a strong base of reflection, and self-analysis with commitment to improve their practice, as important factors. These are considered to be examples of self-assessment and critical-judgment development and ability (Dreyfus and Dreyfus, 1986; Cato and Murray, 2010).

The strength of reflection brought about by good facilitation is at the core of the DSPiNE model. The academics were keen to detail how the learning outcomes not only supported realism but were also mapped to the correct progression point for the learner in order to ensure an appropriate level of engagement and challenge (Mezirow, 2000; Lasater, 2007; Levett-Jones et al., 2010). However, these processes can only occur in the presence of developed cue sensitivity. Benner et al., (2010) argued that it is the development of sufficient cue sensitivity that will enable the detection of potential errors.

Clinical reasoning is the process by which nurses collect cues, process information, come to an understanding of a patient problem or situation, plan and implement interventions, and evaluate outcomes (Levett-Jones et al., 2010; Hoffman et al., 2011). A firm grasp of the clinical reasoning process goes some way towards undoing the reported ‘messiness’ within clinical situations in a way that the student nurse can retain the experience from simulation and draw upon it when needed in clinical practice (Levett-Jones, 2013). Furthermore, during the debrief there is the opportunity to deconstruct practices and structures within the learning process. There remains a set of values and principles that maintain the rigour and subject specialism of nursing (NMC 2010b). Being able to make distinctions between task and explicit progress (i.e. the task of how to unravel the
actions and thinking undertaken in the scenario) and the implicit process (the way in which these become unravelled and as such create transformation) is an important element within the whole facilitative approach (Reed, 2012), but in particular it promotes timely professional growth for both students and academic members (Levett-Jones and Lapkin, 2014).

I. Limitations and Weaknesses

There are limitations to this research that warrant further discussion. Firstly, a convenience sampling method was used and the deliberate choice of easily accessible undergraduate nursing students and academics currently involved in simulation. Therefore, the ability to generalise to other HEIs and other health professionals involved within simulation is limited. Another limitation is the potential for selection bias associated with the use of convenience samples. In addition, participation was voluntary and it is possible that the opinions reported might not be representative of all nursing students and academics involved within simulation. However, this research attempted to minimise selection bias by recruiting participants from student and academic groups unknown to the researcher. Lastly, the study findings may also be limited by the use of focus groups; although this was minimised through the anonymity of responses, there were identifiable ‘spokespeople’ within both the student and the academic groups. Taken together, these limitations mean that the results of this study should be interpreted with caution.

Such an approach to research required a greater intensity of investigation in order to establish a high-quality result founded upon a given set of experiences and
responses. This approach sought to establish the research factor of rigor, but not that of generalisation, because through insights, reflections, and mutual experiential explanations, these research components are unique for a specific time and place, a situation that prevents generalisation and indeed duplication. However, effective educational research is capable of producing what Stake (1978) termed naturalistic generalisations, which can provide a strong evidence base for future educational research and practice (Goding and Edwards, 2002) and this was an inherent notion within this doctoral thesis, to break free from personal beliefs about the way things should be that may be limiting.

Indeed, the researcher and the participants interacted positively during data collection and thus the knowledge shared here is constructed through the lens of the researcher’s interpretation of that data, where the participants were interactive and constructive (Markey et al., 2014). A sense of reciprocity was generated between the participants and the researcher (Charmaz, 2006), which has potentially enhanced the objectivity of the study. It was previously acknowledged that one’s own tacit knowledge and experiences could be difficult to separate from the findings, however, it is with these influences in mind, synergy has been created, with the adoption of a constructivist inquiry framework and that of professional practice advancement where experience, reflection, construction and consolidation have featured widely.

II. Implications for further research

Suggestions for further research have been made throughout this thesis; to summarise, one of the key focus areas must be to establish a robust method for
securing the existing evidence that relates to the transference of clinical expertise gained within the simulation environment to the realities of clinical practice. One of the difficulties is measuring the ‘real’ impact currently is that this is self-reported by the students. However, revealing greater evidence for analysis from a larger cohort holds much excitement, and is worthy of further focused research to explicate firm evidence for the existence of such transferability. Given the expense of setting up a simulation laboratory, research must also focus on how simulation education can improve patient outcomes within the clinical area. This remains one of the greatest gaps within simulation research. A recommendation is made to advance multi-site, outcome-based rigorous studies to gain insight into advancing simulation research beyond what is already known and explicate evidence for the existence of such transferability. This would involve clinical staff and potentially service user and carer for triangulation.

The DSPiNE model developed through this study is an original contribution to the knowledge base within simulation and may provide a useful tool for the implementation of simulation-based pedagogy. It may also have the potential to evaluate experiential educational techniques, leading to improvements within the professional practice environment. There is a major gap in simulation research regarding the availability of valid and reliable simulation evaluation tools. The simplicity of the model lends itself for other academics working within simulation to implement and evaluate their practice.

The findings from this study have important implications for furthering the pedagogical approach of simulation, and fundamentally aim to reinforce the attitudes of academics and nursing students who have already had positive
simulation experiences. Another exciting feature of the model is the potential to use both the inner and outer circles to map and contextualise the processes of preparedness for practice and the transference to clinical practice. In particular, the outer dimensions lend themselves as a process to facilitate debriefing and offer a step-by-step approach to the implementation of good practice. The implementation of such a model carries little risk, however, academics may well be resistant to implementing a new educational technique (Aldridge and Wanless, 2012). Finally, it will be important to explore the impact of co-variables internal and external to those identified within the DSPiNE model that have the potential to impact upon simulation experiences. For instance, the level of fidelity in terms of simulation design is an area where participants had differing points of view.

Despite the limitations, the results of this study are useful as a base for further research having highlighted some of the gaps. Furthermore, they inform the development of strategies that may be applied to enhance patient safety, nursing confidence, competence and clinical decision-making.

### III. Implications for practice

Throughout this thesis, the developments and findings have become significant and real and many instances in changes of personal and professional practice have been made and disseminated (9).

Through a qualitative case study research approach that has utilised the principles of action research within professional practice, the enquiry had its antecedent within the questions “How do I improve my practice?” and “How can I share this within my own community?” Indeed, teacher practitioner research is
inextricably linked with professional development and ways in which researchers can represent theories about their practice (Burton and Bartlett, 2005). Within this approach, a form of practitioner educational theory that is open-ended and contains an intention to create something better has been presented (Wong, 2008). Through this study, meaningful data related to the practice of simulation have been attained, analysed and synthesised. The study has detailed some of the characteristics that are positive features and have the potential to make simulation more effective within nurse education. Purposeful positive behavioural change could be achieved in the implementation of the DSPiNE model. Further dissemination, testing and validation of the model, both within personal professional practice and within the wider community of simulation, presents as an exciting opportunity.

The development and implementation of strategies to enhance simulation activity and evaluation of educational techniques is ongoing and continues to grow at an exponential rate. The inherent usefulness of models such as the DSPiNE is that they can identify variables to target with experiential educational techniques. Specifically, the results of the present study suggest that such techniques may be most successful if they focus on collaborative learning, and the application of reflection to escalate the level of student competence. Several other elements have importance for developing professional practice competence in preparation for the timely and confident implementation of those techniques.
Recommendations

Based on the findings from this small case study some recommendations can be made for practice.

- The implementation of the conceptual model for ‘Developing Simulation Practice in Nurse Education’ (DSPiNE) should be considered for integration into curricular as a guide for enhancing preparedness for, and transference of skills learnt within simulation into clinical practice.

- In order for academic members to feel prepared to undertake good facilitation there needs to be a development phase where they have a sense of being adequately prepared to undertake their role within simulation. Be knowledgeable of the design characteristics, coupled with an environment where communities of practice can flourish and a system of effective mentorship can be developed.

- The characteristics for effective simulation experiences should be encouraged through good facilitation, where the student is at the centre of the encounter, engaged within team working, and collaborative learning are central.

- Students and academics should be encouraged to engage within a structured debrief, in readiness for the transference to clinical practice, that includes escalation of professional practice and the integration of critical reflection and clinical reasoning. The outer circle of the DSPiNE model presents as a useful framework to facilitate this process.
IV. Conclusion

Through the case study approach, a ‘big-picture’ view of some of the characteristics that make simulation effective have been described, this has primarily been achieved by the author acting as a journeying practitioner researcher throughout this study. It has been considered important to outline the process taken to translate and interpret the transcripts of the study participants. Despite the limitations that have been explained, the study results have demonstrated that simulation can be highly effective, and developed in a way that significantly enhances student learning. A conceptual model has been developed from the data and presented to capture and authenticate the experiences shared by the participants involved within the study.
REFERENCES


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# APPENDICES INDEX

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APPENDIX ONE:

GLOSSARY OF TERMS

This glossary of terms presents insight into the intention of the language used to describe certain characteristics within the simulation activities. Standardized terminology promotes consistency and understanding in education, practice, research, and publication. Standardized terminology also promotes consistency of experiences regardless of the simulation environment. The main items contained within the glossary are shared and agreed by the Board of Directors (2011) International Nursing Association for Clinical Simulation and Learning (INASCL) and is the most commonly referred to glossary within the simulation community.

I. Terms

Affective

Refers to a domain of learning that involves attitudes, beliefs, values, feelings, and emotions. Classification of this domain of learning is hierarchal where learning occurs along a continuum of stages related to internal personal and professional growth. This domain of learning is also commonly referred to as “attitudes”.

Andragogy

Expands on pedagogy and refers to active, learner-focused education for people of all ages. It is based on learning principles that involve problem solving that is relevant to the learner’s everyday experiences.

Assessment

Refers to processes that provide information about or feedback about individual participants, groups, or programs. Specifically, assessment refers to observations of progress related to knowledge, skills, and attitudes. Findings of assessment are used to improve future outcomes.

Clinical

Pertaining to or founded on actual or simulated assessment and care of individuals, families, or groups in health care settings, as distinguished from
theoretical. Learning in actual or simulated clinical environment(s) permits opportunities for application of knowledge, skills, and attitudes.

**Clinical Judgment**

The art of making a series of decisions to determine whether to take action based on various types of knowledge. The individual recognizes changes and salient aspects in a clinical situation, interprets their meaning, responds appropriately, and reflects on the effectiveness of the intervention. Clinical judgment is influenced by the individual’s previous experiences, problem-solving, critical-thinking, and clinical-reasoning abilities.

**Clinical Reasoning**

The ability to gather and comprehend data while recalling knowledge, skills (technical and nontechnical), and attitudes about a situation as it unfolds. After analysis, information is put together into a meaningful whole when applying the information to new situations.

**Clinical Scenario**

The plan of an expected and potential course of events for a simulated clinical experience. The clinical scenario provides the context for the simulation and can vary in length and complexity, depending on the objectives.

**Cognitive**

Refers to a domain of learning that includes knowledge, comprehension, application, analysis, synthesis, and evaluation. The goal of learning in this domain is to help participants progress to higher levels of learning so they are able to make judgments about the subject at hand. This domain of learning is also commonly referred to as “knowledge”.

**Competence**

Standardised requirement for an individual to properly perform a specific role. It encompasses a combination of discrete and measurable knowledge, skills, and attitudes that are essential for patient safety and quality patient care.

**Confidence**

Belief in oneself and one’s abilities.
**Constructive Alignment.**

Where the learning outcomes are deliberately aligned to the learning activities in a way that the learners can construct meaning from activities they undertake, in a progressive way.

**Constructive Integration.**

Where the learning activities are deliberately integrated within the curriculum in a way that the learners can progress developmentally within an educational hierarchal framework.

**Constructivism**

Philosophical theory of learning that views knowledge as something that individuals construct for themselves through their interaction with their environment. In constructivism, learning is a process of discovery whereby the learner seeks to understand issues, which guide the discovery process that is personally relevant. Learning is contextual and occurs when situated in a realistic setting. Simulation is often based on constructivist theories.

**Critical Thinking**

A disciplined process that requires validation of data, including any assumptions that may influence thoughts and actions, and then careful reflection on the entire process while evaluating the effectiveness of what has been determined as the necessary action(s) to take. This process entails purposeful, goal-directed thinking and is based on scientific principles and methods (evidence) rather than assumptions or conjecture.

**Cues**

Information provided that helps the participant progress through the clinical scenario to achieve stated objectives.

**Debriefing**

An activity that follows a simulation experience and is led by a facilitator. Participants’ reflective thinking is encouraged, and feedback is provided regarding the participants’ performance while various aspects of the completed simulation are discussed. Participants are encouraged to explore emotions and question, reflect, and provide feedback to one another. The purpose of debriefing is to move toward assimilation and accommodation to transfer learning to future situations.
**Decision-Making Abilities**

An outcome of mental processes (cognitive process) leading to the selection of a course of action from among several alternatives.

**Domains of Learning**

Three separate, yet interdependent components of learning outcomes achievable by learners. These domains-cognitive, affective, and psychomotor-represent various categories and levels of learning complexity and are commonly referred to as educational taxonomies’.

**Embedded Participant (also known as simulated patient, Role Player, or patient actor)**

A role assigned in a simulation encounter to help guide the scenario. The guidance may be influential as positive, negative, or neutral or as a distracter, depending on the objective(s), the level of the participants, and the scenario. Although the embedded participant’s role is part of the situation, the underlying purpose of the role may not be revealed to the participants in the scenario or simulation.

**Facilitation**

A method and strategy that occurs throughout (before, during, and after) simulation-based learning experiences in which a person helps to bring about an outcome(s) by providing unobtrusive guidance.

**Facilitator**

An individual who provides guidance, support, and structure during simulation-based learning experiences.

**Feedback**

Information given or dialogue between participants, facilitator, simulator, or peer with the intention of improving the understanding of concepts or aspects of performance.

**Formative Assessment**

Assessment wherein the facilitator’s focus is on the participant’s progress toward goal attainment; a process for an individual or group engaged in a simulation activity for the purpose of providing constructive feedback for that individual or group to improve.
Fidelity (also known as Realism/Authenticity)

Believability, or the degree to which a simulated experience approaches reality. The level of fidelity is determined by the environment, the tools and resources used, and many factors associated with the participants. Fidelity can involve a variety of dimensions, including (a) physical factors such as environment, equipment, and related to b) psychological factors such as emotions, beliefs, and self-awareness of participants; (c) social factors such as participant and instructor motivation and goals; (d) culture of the group; and (e) degree of openness and trust, as well as participants’ modes of thinking.

Guided Reflection

Process used by the facilitator during debriefing that reinforces the critical aspects of the experience and encourages insightful learning, allowing the participant to assimilate theory, practice, and research in order to influence future actions.

High Fidelity

Experiences using full scale computerized patient simulators, virtual reality or standardized patients that are extremely realistic and provide a high level of interactivity and realism for the learner.

Interprofessional

Two or more professionals collaborating as a team with a shared purpose, goal, and mutual respect to deliver safe, quality health care.

Interprofessional Education

When students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes.

Knowledge

The awareness, understanding, and expertise an individual acquires through experience or education.

KSA

Acronym for the knowledge, skills, and attitudes necessary to continuously improve the quality and safety of the health care systems within which they work.
Low Fidelity

Experiences such as case studies, role-playing, using partial task trainers or static mannequins to immerse students or professionals in a clinical situation or practice of a specific skill.

Measurement

The process of quantifying a participant's abilities related to knowledge, skills, or attitudes in the achievement of objectives.

Moderate or Midlevel Fidelity

Experiences that are more technologically sophisticated such as computer-based self-directed learning systems simulations in which the participant relies on a two-dimensional focused experience to problem solve, perform a skill and make decisions or the use of mannequins more realistic than static low fidelity ones having breath sounds, heart sounds and/or pulses.

Objective

Statement(s) of specific measurable results that participant(s) is expected to achieve during a simulation-based learning experience.

Outcome

Measurable results of the participants' progress toward meeting a set of objectives. Expected outcomes are the change in knowledge, skills, or attitudes as a result of the simulation experience.

Participant

One who engages in a simulation-based learning activity for the purpose of gaining or demonstrating mastery of knowledge, skills, and attitudes of professional practice.

Pedagogy

The art or science of instructional methods. The study of teaching methods, including goals of education and the ways those goals can be achieved.

Psychological Fidelity.

The degree to which the student perceives the simulation to be a believable representation of the reality it is attempting to duplicate.
**Physical Simulation**

A planned simulation activity that utilises manikins and/or simulated patients to achieve the learning outcomes.

**Prebriefing (Briefing)**

An information or orientation session held prior to the start of a simulation-based learning experience in which instructions or preparatory information is given to the participants. The purpose of the prebriefing or briefing is to set the stage for a scenario and assist participants in achieving scenario objectives. Suggested activities in a prebriefing or briefing include an orientation to the equipment, environment, mannequin, roles, time allotment, objectives, and patient situation.

**Problem Solving**

Refers to the process of selectively attending to information in the patient care setting, using existing knowledge and collecting pertinent data to formulate a solution. This complex process requires different cognitive processes, including methods of reasoning and strategizing, in order to manage a situation.

**Professional Integrity**

A trait exhibited by one’s ability to consistently and willingly practice within the guidelines of the code of ethics of a chosen profession.

**Program or Process Evaluation**

A systematic collection of information about the activities, characteristics, and outcomes of simulation-based learning activities to make judgments about the program, improve or further program effectiveness, increase understanding, and inform decisions about future programming.

**Prompt**

A cue given to a participant in a scenario.

**Psychomotor**

Refers to a domain of learning that involves skills related to professional practice including fine motor, manual, and gross motor skills. The skills involve the particular physical tasks required of that profession. This domain of learning is also commonly referred to as skills.
Psychomotor Skill

The ability to carry out physical movements efficiently and effectively, with speed and accuracy. Psychomotor skill is more than the ability to perform; it includes the ability to perform proficiently, smoothly, and consistently under varying conditions and within appropriate time limits.

Questioning

The strategic process of seeking information or knowledge, thoughts, feelings, and judgments before, during, and after a scenario.

Reflective Thinking

The engagement of self-monitoring that occurs during or after a simulation experience. Considered an essential component of experiential learning, it promotes the discovery of new knowledge with the intent of applying this knowledge to future situations. Reflective thinking is necessary for metacognitive skill acquisition and clinical judgment and has the potential to decrease the gap between theory and practice. Reflection requires the creativity and conscious self-evaluation to deal with unique patient situations.

Reliability

The consistency of a measurement, or the degree to which an instrument measures in the same way each time it is used under the same conditions with the same participants. It is the repeatability of a measurement. A measurement is considered reliable if a person’s scores on the same test given twice are similar.

Role

A responsibility or character assumed in a simulation-based learning activity.

Safe Learning Environment

The emotional climate that facilitators create by the interaction between facilitators and participants. In this positive emotional climate, participants feel at ease taking risks, making mistakes, or extending themselves beyond their comfort zone. Facilitators should be thoroughly aware of the psychological aspects of learning, aware of the effects of unintentional bias, aware of cultural differences, and attentive to their own state of mind in order to effectively create a safe environment for learning.
Safe Patient Care

Quality care provided by health care practitioners with a focus on the prevention of harm to patients.

Scenario

See Clinical Scenario.

Simulation-activity Learning Experience

An array of structured activities that represent actual or potential situations in education and practice and allow participants to develop or enhance knowledge, skills, and attitudes or analyze and respond to realistic situations in a simulated environment or through an unfolding case study.

Simulation

A pedagogy using one or more typologies to promote, improve, or validate a participant’s progression from novice to expert.

Simulation Learning Environment

A physical location where a simulation-based learning experience takes place and where a safe atmosphere is created by the facilitator to foster sharing and discussion of participant experiences without negative consequences. The simulation learning environment should facilitate trust and foster learning and support the development of professional and interprofessional competency.

Skill Acquisition (Skill Attainment)

After instruction, the ability to integrate the knowledge, skills (technical and nontechnical), and attitudes necessary to provide safe patient care. The individual progresses through five stages of proficiency: novice, advanced beginner, competent, proficient, and expert.

Skill Development

The progress along a continuum of growth in knowledge, skills, and attitudes as a result of educational or other experiences.

Standardized Patient (or Simulated Patient)

A person trained to consistently portray a patient or other individual in a scripted scenario for the purposes of instruction, practice, or evaluation.
Summative Evaluation

Evaluation at the end of a time period, in which participants are provided with feedback about their achievement of outcome criteria; a process for determining the competence of a participant engaged in an activity.

Teacher (Academic, Lecturer)

One who uses a system of directed and deliberate actions and activities for the purpose of inducing learning.

Validity

The degree to which a test or evaluation tool accurately measures the intended concept of interest.

Virtual Simulation

A planned simulation activity that utilises computer gaming, virtual reality and 3D sources to achieve the learning outcomes.

II. Original INACSL Standard I Reference

APPENDIX TWO

LITERATURE REVIEW METHOD

Several key search terms were used to carry out the literature search using the following indexes: CINAHL (Cumulative Index of Nursing and Allied Health Literature), MEDLINE databases that contain biomedical literature, and Web of Knowledge. These indexes relate to Nursing and Allied Health Care Professionals and are considered to offer international resources, covering English and foreign reference materials (Polit and Beck, 2014) with the advantage of offering relevant journals, books and report articles that are readily available. The year 2000 was selected as an appropriate cut-off date, permitting an overview of literature over the past fourteen years (Table a.1 details the overview of inclusion and exclusion criteria).

<table>
<thead>
<tr>
<th>Inclusion and exclusion criteria</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary inclusion data</strong></td>
<td><strong>Primary exclusion criteria</strong></td>
</tr>
<tr>
<td>2000 to present day</td>
<td>Pre 2000</td>
</tr>
<tr>
<td>Simulation within pre-registration nursing</td>
<td>Post registration nursing</td>
</tr>
<tr>
<td>Facilitation within simulation (includes debriefing)</td>
<td>Skills teaching – unless ‘simulation’ is the main focus of the paper</td>
</tr>
<tr>
<td>Pre-registration nursing education</td>
<td>Medical education</td>
</tr>
<tr>
<td>International papers</td>
<td>Virtual simulation</td>
</tr>
<tr>
<td>English language</td>
<td>Specialist simulation application e.g. critical care.</td>
</tr>
</tbody>
</table>

Table a.1: Inclusion and exclusion criteria within literature review method.
To arrive at the results set 1 included the phrases “nurs* training” or “nurs* education” OR “Education, Nursing+” which captured all results for and its variations (see Table 2.1). Set 5 is a combination of set 1 AND set 2 and includes all results for simulation. In set 6 these two sets are combined with AND, so each article of the 2,336 articles includes information on nurse education as well as simulation.

The phrase learner-centred is set 3. In combining set 3 (learner-centred) with set 5 (nurse education and simulation) resulted in Set 6, just 7 results. It would appear that learner-centred is a phrase, which is not often used in the literature. The search was repeated with a combination of set 5 AND set 4 (facilitate*), resulting in set 7. After performing the Boolean searches 123 articles dating from 2000 were retrieved. Retaining the topic as the main focus of the document, the search was limited further by using an inclusion and exclusion criteria and the restrictions offered by the database (Table a.2).

<table>
<thead>
<tr>
<th>Key Subject Search Terms</th>
<th>ALL PAPERS</th>
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<tr>
<td>1. Nurse education</td>
<td>29,712</td>
</tr>
<tr>
<td>2. Simulation</td>
<td>25,580</td>
</tr>
<tr>
<td>3. Learner-centred</td>
<td>135</td>
</tr>
<tr>
<td>4. Facilitation</td>
<td>41,745</td>
</tr>
<tr>
<td>5. ‘simulation’ AND ‘nurse education’</td>
<td>2,336</td>
</tr>
<tr>
<td>6. Combine 3 AND 5</td>
<td>7</td>
</tr>
<tr>
<td>7. Combine 4 AND 5</td>
<td>123</td>
</tr>
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</table>
Abstracts were reviewed and all duplicates removed. Those papers that did not include the term ‘simulation’ in either the title or abstract were removed. To refine the focus further, all papers that did not link simulation to the education of pre-registration (undergraduate) nurses were subsequently excluded. The vast majority of papers spanned the last decade originating from United Kingdom, Europe, Australia, Canada and United States of America. The analysis was limited to papers published in English with selected material retrieved and reviewed in full to gain understanding of the use of simulation. Further studies were excluded where the primary variable included either reference to virtual simulation, web based simulation, clinical skills or medical/surgical skills training.

It was considered important that the selection criteria only considered reviews relevant to nursing and so the broad term of nursing was used consistently within the inclusion criteria, with the research aim and questions at the forefront of the appraisal.

The articles were all undertaken within Schools of Nursing, predominantly by senior academic members, the papers were from United States of America (USA), Canada, Australia (AUS) and United Kingdom (UK). All were published in reputable nurse educational journals. Whilst many things do not translate well from the USA to the UK (particularly health care in general) all of these papers appear to have some relevance to the UK university nurse education system. This review focuses on a range of publication types including literature reviews, concept analysis, qualitative and quantitative study designs. Fourteen full text journal articles were selected for inclusion, with 10 of these being primary studies.
offering evaluation of current nursing simulation; reference lists were searched which provided a further two papers of relevance for inclusion (Centre for Reviews and Dissemination - CRD, 2009). This process is summarised in Figure a.1.

<table>
<thead>
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<th>Process</th>
<th>Papers (n=)</th>
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<td>26</td>
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<td>Pre-2000</td>
<td>46</td>
<td>8</td>
<td>Needs to be post-2000</td>
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<tr>
<td>Primary Inclusion Criteria</td>
<td>38</td>
<td>23</td>
<td>Medical/Anaesthetic/Emergency Care focus</td>
</tr>
<tr>
<td><strong>Nursing</strong></td>
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<tr>
<td>FINAL PAPERS</td>
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<tr>
<td>Retrieved from primary paper reference list</td>
<td>+3</td>
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<td>Well referenced primary sources</td>
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<td>Total 18 papers</td>
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</tbody>
</table>

Figure a.1: Flow chart of study selection process
Each of the studies included within the literature review were appraised for methodology, rigour and quality following the guidelines provided by the Centre for Reviews and Dissemination (CRD, 2009) using an adapted framework (Greenhalgh, 2014) and this is further detailed within the data extraction framework at appendix 3. The strength of evidence score was based on the hierarchy of evidence ranking scale devised by Evans (2003) and makes reference to the effectiveness, appropriateness and feasibility of each study appraised, which provides a broader base for evaluating healthcare research.
APPENDIX THREE

DATA EXTRACTION TOOL
### Appendix Three: Data Extraction: Exploring Participants’ Experiences of Simulation-Based Pedagogy using Case-Study Research.

<table>
<thead>
<tr>
<th>Authors and Title</th>
<th>Profession</th>
<th>Aims</th>
<th>Study Population</th>
<th>Sample Size</th>
<th>Data Collection</th>
<th>Summary of findings</th>
<th>Highe</th>
<th>Strength of Evidence (Bos, 2003)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arthur, C., <em>et al.</em></td>
<td>Lecturer in Nursing, AUS</td>
<td>2 are Lecturers in Nursing, AUS One is a PhD student from same institution</td>
<td>To report on a Delphi study that synthesised expert views on the importance of simulation-based learning activities</td>
<td>32 experts</td>
<td>3 rounds, 1st round: a questionnaire was developed based on the literature, 2nd round: a further questionnaire was constructed from the synthesis of round 1 results, 3rd round: the final questionnaire was distributed to participants</td>
<td>Data analyzed and refined through 3 rounds; the Delphi process included feedback from experts, resulting in a refined and comprehensive understanding of key areas.</td>
<td>Higher</td>
<td>E: Adequate, clear definition of Delphi group; A: Good - QI statements consistent with literature review findings overall. Critical aspects were: clear objectives, guidance, and feedback. Simulations were designed to provide immersive and realistic experiences. Observation and reflection on key areas improved understanding.</td>
</tr>
<tr>
<td>Banbolin, D., <em>et al.</em></td>
<td>A Clinical Instructor and 2 associate professors in Nursing, Michigan, USA</td>
<td>To evaluate simulated clinical scenarios for nursing students: Communication, confidence, clinical judgment</td>
<td>Undergraduate nursing students</td>
<td>A convenience sample of 254 undergraduate nursing students (N=112. 33.5%).</td>
<td>A convenience sample of 254 undergraduate nursing students (N=112.33.5%).</td>
<td>Completion of student survey, indicating confidence in certain skills before and after simulation experiences. Three open-ended questions asked for qualitative data.</td>
<td>Stronger</td>
<td>E: Excellent, evidence from current literature. A: Excellent - QI statements consistent with literature review findings overall. Critical aspects were: clear objectives, guidance, and feedback. Simulations were designed to provide immersive and realistic experiences. Observation and reflection on key areas improved understanding.</td>
</tr>
</tbody>
</table>

*Further data and analysis discussed.*
<table>
<thead>
<tr>
<th>Authors and Title</th>
<th>Methodology</th>
<th>Design</th>
<th>Study Population</th>
<th>Sample Size</th>
<th>Data Collection</th>
<th>Summary of Findings</th>
<th>Figure</th>
<th>Strength of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown, L. (2013)</td>
<td>Simulation as an effective professional approach for nursing education</td>
<td>To explore the theoretical positioning and understanding of simulation as a teaching and learning approach for pre-registration nursing.</td>
<td>SR: A systematic review of the literature to establish the theoretical basis of simulation as an effective educational approach, enabling students to learn to be nurses.</td>
<td>Literature review: although an evidence of systematic reviewed process.</td>
<td>Literature pertaining to the evolution of simulation in nursing: learning through simulation: understanding the learning process.</td>
<td>To assess the effectiveness of simulation in improving the critical thinking skills and decision-making abilities of nursing students.</td>
<td>G</td>
<td>Strong</td>
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</table>

The paper presents a systematic review of the literature on simulation as an educational approach for nursing education. The review highlights the importance of simulation in promoting critical thinking, problem-solving, and decision-making skills among nursing students. The study concludes that simulation is an effective educational approach, enabling students to learn to be nurses.

Key contributions to theory:
- Theoretical framework and learning design practices.
- Equally, consistency and regulation in the learning process.
- Professional role development: simulation.

This research emphasizes the importance of simulation in nursing education and its potential to improve the critical thinking skills and decision-making abilities of nursing students. The findings support the use of simulation as an effective educational approach, enabling students to learn to be nurses.


E. Illustrations, A. Appropriateness, P. Feasibility (Grun, 2022).


De Looze, S., and SPSS used for data analysis: Descriptive analysis. Undergraduate students in first-year students.

Compliance of statistical software with student satisfaction with simulation is high. A correlation is observed between the two variables. Data were analyzed and correlated with learning styles identified by a previous study. Data revealed a positive relationship between the social and solitary learning styles and student satisfaction with simulation. Multiple regression analysis was used to identify the significant predictors of student satisfaction with simulation.

Data analysis and correlation learning styles and simulation. Multivariate regression analysis was used to identify the significant predictors of student satisfaction with simulation.

A novel approach to understanding learning styles and simulation. Multivariate regression analysis was used to identify the significant predictors of student satisfaction with simulation.

E. Pent - worst case scenario presented.
D. Pent - very short officially acknowledged.
C. Pent - unacceptable study.
<table>
<thead>
<tr>
<th>Authors and Title</th>
<th>Profession</th>
<th>Also</th>
<th>Design</th>
<th>Study Population</th>
<th>Sample Size</th>
<th>Data Collection</th>
<th>Summary of Findings</th>
<th>Significance</th>
<th>Strength of Evidence</th>
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<tbody>
<tr>
<td>Alternative Use of Simulation in Teaching Nursing Care of Children: A National</td>
<td>Engineer</td>
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<td>Multi-Simulated Study: National League for Nursing</td>
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<td>To develop and test models that nursing faculty can implement. To develop a</td>
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<td>series of nursing faculty that can use simulation in innovative ways to enhance</td>
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<td>student learning. To contribute to the refinement of the model by knowledge</td>
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<td>gained from simulation in teaching education, and To demonstrate the value of</td>
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<td>collaboration.</td>
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<td>Multi-simulated project.</td>
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<td>220 student participants in one part of the study (generalized in Child &amp;</td>
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<td>Hospital, 2006).</td>
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<td>410 students participated in second part of the study.</td>
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<td>150 students participated in the third part of the study.</td>
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<td>Four phases in the project of which the last two involved research. Pre-test,</td>
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<td>post-test, post-test.</td>
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<td>These groups were assigned to the design.</td>
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<td>The EPWS and SOS were administered and their scores were evaluated.</td>
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<td>Students participated in one part of the study (generalized in Child &amp; Hospital,</td>
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<td>2006).</td>
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<td>410 students participated in second part of the study.</td>
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<td>150 students participated in third part of the study.</td>
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<td>First study, there was a significant difference between the pre- and post-test</td>
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<td>results in the EPWS and SOS.</td>
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<td>High-safety manipulants received the highest rating on the Educational</td>
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<td>Practice in Simulation Scales (EPWS) and in Simulation Scales (SOS).</td>
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<td>The second study, using the Simulation Design Scale (SDS), the students</td>
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<td>received the highest-safe manipulation scores in the SDS, feedback to be equal</td>
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<td>with both manipulants, and more realism, adding less realism with both</td>
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<td>manipulants. Using the EPWS, students felt that the high-safety manipulants</td>
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<td>provided more diverse ways of learning and active learning took place with the</td>
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<td>manipulants. The pre- and post-test results were not significant.</td>
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<td>In the third study, students using the high-safety manipulants reported greater</td>
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<td>diverse ways of learning and were more involved in the simulation.</td>
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<td>Key contribution to themes:</td>
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<td>• Most important simulation design feature was found to be flexibility and</td>
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<td>credibility.</td>
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<td>• Educational practices included in the instructions were active learning,</td>
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<td>collaboration, diverse ways of learning, and high</td>
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<td>representation.</td>
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<td>• Active involvement, assessment, and problem solving, followed by a reflection</td>
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<td>of thinking experiences, facilitate increased self-confidence in students.</td>
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<td>Note this paper the authors present a theoretical framework: Nursing...</td>
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<td>Although not revised specifically for the use of simulation in nursing education</td>
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<td>approaches, however, the reference is made to this anywhere in the study.</td>
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<td>One would expect an explanation. Within the discussions of “design characteristics”</td>
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<td>flexibility and credibility, which are important to this study.</td>
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<td>Interestingly this model does appear to the publication in 2007 (Jeffries and</td>
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<td>Rogers). Study included 3 years, and had many stages, consultant with voice of</td>
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<td>professional and student groups, which enhances authenticity. Large project</td>
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<td>sponsored by Landmark, the largest company for simulation equipment in the USA</td>
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<td>and increasingly so in the UK.</td>
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</table>


E: Effectiveness, A: Appropriateness, P: Feasibility (Brown, 2007)
<table>
<thead>
<tr>
<th>Authors and Title</th>
<th>Design</th>
<th>Study Population</th>
<th>Sample Size</th>
<th>Data Collection</th>
<th>Summary of Findings</th>
<th>Rationale</th>
<th>Strength of Evidence (Carnine, 2003)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kabala, A.-E., Arkhut, T., Lampert, J. &amp; South, N. (2015)</td>
<td>Qualitative Method: 17 from institution A, 13 from institution B</td>
<td>To evaluate the implementation of evidence-based quality indicators for simulation experiences in undergraduate nursing programs (Arkhut et al., 2015)</td>
<td>Two focus group interviews of 24 participants.</td>
<td>Qualitative method: 17 from institution A, 13 from institution B</td>
<td>Data obtained using data collection (ICL)</td>
<td>Student evaluation instrument completed following the session. To assess student perception of the extent to which quality indicators were addressed (Arkhut et al., 2015). Formative Qs (FQ) monitored. Preparatory (P) Preparing (P) Authority (A) Authenticity (A)</td>
<td>A critical review (Carnine, 2003)</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Title</td>
<td>Journal</td>
<td>Volume</td>
<td>Issue</td>
<td>Year</td>
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**Table 1:**

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<thead>
<tr>
<th>Title</th>
<th>Journal</th>
<th>Volume</th>
<th>Issue</th>
<th>Year</th>
<th>Page Range</th>
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</thead>
</table>

**Table 2:**

<table>
<thead>
<tr>
<th>Title</th>
<th>Journal</th>
<th>Volume</th>
<th>Issue</th>
<th>Year</th>
<th>Page Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authors and Title</td>
<td>Profession</td>
<td>Aim</td>
<td>Design</td>
<td>Study Population</td>
<td>Sample Size</td>
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<tr>
<td>Roberts, R. (2011)</td>
<td>University of Manchester, UK</td>
<td>To evaluate the potential for future curriculum development using simulated learning strategies in undergraduate nursing programmes.</td>
<td>SLR</td>
<td>Literature review - very little research on the topic identified.</td>
<td>56 articles were searched for, but it is unclear how many were actually used for data analysis, as well as the total number of review articles. Potential exclusions were made</td>
</tr>
</tbody>
</table>

| Schultz. V. A., Smuin, J.A. & Blackham, Y. (2007) | All-female University of Bradford, School of Nursing, Leeds, UK | To evaluate the use of a controlled-simulation task to enhance the knowledge and understanding of adult and advanced care nurses. | Experimental | Sample size not reported. | 22 participants from the population. | There were four key variables: | Comparison of outcomes showed significant improvement in knowledge and confidence enhancement. | Qualitative evidence was collected to enhance the data collection process, particularly within the evaluation phase. Qualitative evidence does not fit well with the overall methodology. Although the hypothesis was not tested, the students' understandings were not found to be any different from the quantitative performance assessment applied. What one could argue is that the sample was small and the study was limited to certain topics, whereas there were other variables that could be explored in a future study. Students within the experimental group were exposed to an intervention, whereas those within the control group were not. This would allow for a more accurate interpretation of the value of the teaching methods compared. | E: Good, A: Fair, P: Poor |

DLR: Descriptive Literature Review; SLR: Systematic Literature Review; QRA: Qualitative Research; EID: Experimental Design; RCT: Randomized Controlled Trial; AR: Action Research.
<table>
<thead>
<tr>
<th>Authors and Title</th>
<th>Publication</th>
<th>Aim</th>
<th>Design</th>
<th>Study Population</th>
<th>Sample Size</th>
<th>Data Collection</th>
<th>Summary of Findings</th>
<th>Rigour</th>
<th>Strength of Evidence (Evers, 2002)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smith, S.L., &amp; Bond, C.J. (2018)</td>
<td>High fidelity simulation: Factors correlated with nursing students’ self-efficacy and self-confidence</td>
<td>To examine the effects of simulation</td>
<td>Undergraduate students in their second year of training</td>
<td>A convenience sample of 75 students (n=48 participated from three institutions)</td>
<td>Survey design</td>
<td>Completion of student satisfaction and self-confidence survey at the start and end of their simulation experience.</td>
<td>Undergraduate students in their second year of training</td>
<td>Undergraduate students in their second year of training</td>
<td>A superficial and descriptive paper. Very limited discussion regarding learning styles and correlation to satisfaction with simulation. Interesting that there could be a benefit to combining these two methods of learning.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Authors and Title</th>
<th>Paper Reference</th>
<th>Summary of Findings</th>
<th>Strength of Evidence</th>
<th>Focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Effect of simulation on surgical knowledge and performance&quot;</td>
<td>Lien, H.J., et al. (2021)</td>
<td>Participants in the simulation group showed significantly improved surgical knowledge and performance compared to those in the control group.</td>
<td>E: Adequate</td>
<td>A: Good, F: Adequate</td>
</tr>
</tbody>
</table>

The Data Extraction Framework is based upon the work of the guidelines provided by the Centre for Reviews and Dissemination (CRD, 2009), in conjunction with the critique framework outlined by Greenhalgh (2014) and the strength of evidence score from the ranking scale devised by Evans (2003).
APPENDIX FOUR

ETHICAL APPROVAL FORM
16th May 2013
Mel Humphreys
School of Nursing and Midwifery
CEC
UHNS
Newcastle Road
Stoke-on-Trent
ST4 6QI

Dear Mel Humphreys

Re: ‘The evaluation and development of simulation practice within undergraduate nursing programmes’

Thank you for submitting your revised project for review.

I am pleased to inform you that your project has been approved by the Ethics Review Panel.

The following documents have been reviewed and approved by the panel as follows:

<table>
<thead>
<tr>
<th>Document(s)</th>
<th>Version Number</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summary Proposal</td>
<td>2</td>
<td>7th May 2013</td>
</tr>
<tr>
<td>Letter of Invitation(s)</td>
<td>2</td>
<td>7th May 2013</td>
</tr>
<tr>
<td>Information Sheet(s)</td>
<td>2</td>
<td>7th May 2013</td>
</tr>
<tr>
<td>Consent Form(s)</td>
<td>2</td>
<td>7th May 2013</td>
</tr>
<tr>
<td>Consent Form(s) for use of quotes</td>
<td>2</td>
<td>7th May 2013</td>
</tr>
<tr>
<td>Focus group Guide(s)</td>
<td>2</td>
<td>7th May 2013</td>
</tr>
</tbody>
</table>

If the fieldwork goes beyond the date stated in your application (September 2013), you must notify the Ethical Review Panel via Elizabeth Cameron
APPENDIX FIVE

PARTICIPANT INFORMATION SHEET
Participant Information Sheet

Study Title: The evaluation and development of simulation practice pedagogy within undergraduate nursing programmes.

Aims of the Research
This study will explore and describe how simulation experiences impact upon learning within undergraduate nursing programs.

The indicators have been designed to identify the key elements of effective simulation design and implementation including: Pedagogical principles, Fidelity, Student preparation and orientation, Staff preparation and training and Debriefing associated with simulation experiences; they have not yet been applied to simulation education within the UK.

Invitation
You are being invited to participate within the above research study. The study is being undertaken by an academic currently undertaking Professional Doctorate Studies within a School of Nursing and Midwifery and will form part of an educational evaluation.

Before you decide whether or not you wish to take part, it is important for you to understand why this research is being done and what it will involve. Please take time to read this information carefully and discuss it with friends and relatives if you wish. Ask us if there is anything that is unclear or if you would like more information.

Why have I been chosen?
We have purposefully selected your cohort of study as the researcher aims to collect data within a given timeframe and when simulation activities are being delivered as part of the normal teaching and learning schedule within the undergraduate nursing programme. Participants will include staff and students who would be engaging within these activities at this time.

Do I have to take part?
You are free to decide whether you wish to take part or not. If you do decide to take part you will be asked to sign two consent forms, one is for you to keep and the other is for our records. You are free to withdraw from this study at any time and without giving reasons.

What will happen if I take part?
The researcher will collect data after the simulation sessions using the approved study instrument:
1. Staff and student focus groups which will be audio recorded.
If I take part, what do I have to do?
The simulation event will be part of the planned teaching and learning activities for the module of study. Therefore the additional activity will be the focus group discussion (approximately 30 minutes duration). The focus group will take place at the end of the simulation practice; time will be allocated within the daily timetable and a classroom identified.

What are the benefits (if any) of taking part?
Participation within the study will not directly benefit individuals' but will contribute to the wider understanding of the design and implementation of simulation within the undergraduate nursing programme.

What are the risks (if any) of taking part?
The researcher does not believe any risks are posed to you during participation within the study.

How will information about me be used?
Data collected during this study will be used within publications regarding the development of simulation pedagogy, which will include conference presentations. The data collected will be retained for use in future research studies which include international comparisons, further ethical approval will not be sought if the original data collected is being considered for utilisation within studies that continue to aim to further simulation pedagogy.

Who will have access to information about me?
The researcher will have access to the information collected, which includes video footage and audio recordings from the focus groups. Data will be kept secure, with all personal data remaining confidential.

- That data will be stored securely on a password protected computer
- All data will be transcribed and coded, therefore your identity will not be revealed
- That the data will be stored in line with Keele’s guidelines and the data will be retained by the principal investigator for at least five years
- Following this period the data will be securely disposed of, in accordance with Keele’s guidelines.

The researcher has to work within the confines of current legislation over such matters as privacy and confidentiality, data protection and human rights and so offers of confidentiality may sometimes be overridden by law. For example in circumstances whereby I am made aware of future criminal activity, abuse either to yourself or another (i.e. child or sexual abuse) or suicidal tendencies I must pass this information to the relevant authorities.

Who is funding and organising the research?
The research is being undertaken as part of a Professional Doctorate which has been funded by the School of Nursing and Midwifery, Keele University.
What if there is a problem?
If you have a concern about any aspect of this study, you may wish to speak to the researcher who will do their best to answer your questions. You should contact Mel Humphreys on m.humphreys@keele.ac.uk.

If you remain unhappy about the research and/or wish to raise a complaint about any aspect of the way that you have been approached or treated during the course of the study please write to Nicola Leighton who is the University’s contact for complaints regarding research at the following address:-

Nicola Leighton
Research Governance Officer
Research & Enterprise Services
Dorothy Hodgkin Building
Keele University
ST5 5BG
E-mail: n.leighton@uso.keele.ac.uk
Tel: 01782 733306
APPENDIX SIX

PARTICIPANT CONSENT FORM
PARTICIPANT CONSENT FORM

Title of Project: The evaluation and development of simulation practice pedagogy within undergraduate nursing programmes.

Name and contact details of Principal Investigator:
Mel Humphreys,
CEC, UHNS,
Newcastle Road,
Stoke-on-Trent.
ST4 6QG
m.humphreys@keele.ac.uk,
01782 679696

Please tick box if you agree with the statement

1 I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions.

2 I understand that my participation is voluntary and that I am free to withdraw at any time.

3 I agree to take part in this study.

4 I understand that data collected about me during this study will be anonymised before it is submitted for publication.

5 I agree to the focus group being tape and audio recorded

6 I agree to allow the dataset collected to be used for future research projects

7 I agree to be contacted about possible participation in future research projects.

Name of participant Date Signature

Researcher Date Signature

*please delete as appropriate
APPENDIX SEVEN

STUDENT FOCUS GROUP THEMATIC QUESTIONS

Through focus group methodology the technique of advocacy with inquiry will be embraced to move forward the points elicited; through a facilitative dialogue the group will be encouraged to experientially explore what makes simulation effective.

To the student nurses, the lead questions are:

*In what ways do the approaches used within simulation effect your learning experience?*

  - *Can you identify any specific approaches that were utilised particularly well within this simulation event?*

*What is likely to increase your involvement and engagement within the learning process?*

  - *How do you think this affected your learning?*
  - *How did this affect your involvement within the simulated event?*

*What are the specific elements within simulation that bring it to life for you?*

  - *When do you think simulation is at it’s best?*
  - *Why is it good? What would be the ideal?*
APPENDIX EIGHT

STAFF FOCUS GROUP THEMATIC QUESTIONS

Through focus group methodology the technique of advocacy with inquiry will be embraced to move forward the points elicited; through a facilitative dialogue the group will be encouraged to experientially explore what makes simulation effective.

To the academic staff, the lead questions are:

*In what ways do the approaches you have used within simulation affect the teaching-learning experience?*

- Can you identify any specific approaches that you utilised well within this simulated encounter?

*Can you identify any factors that may increase the student involvement and engagement within the teaching-learning process?*

- How do you think may affect student learning?
- How would these factors affect your role within the simulated event?

*What do you consider to be the specific elements within simulation that bring it to life?*

- When do you think simulation is at it’s best?
- Why is it good? What would be the ideal?
APPENDIX NINE

PROFESSIONAL OUTPUT DURING THESIS JOURNEY

Publications


Conference Presentations:


Workshops at International Conferences:
Humphreys, M. & Rosenorn-Lanng, D. and Bracegirdle, L (2013) Using a Virtual Learning Environment within Simulation to enhance inter-professional team working skills. 5th International Clinical Skills Conference; Building Bridges between Simulation and Practice. 19th – 21st May. Monash University, Prato, Italy.