FACULTY OF SCIENCE, SCHOOL OF HEALTH SCIENCES AND SOCIAL WORK

Transforming the Student’s Experience in Operating Department Practice: Learning through Simulation

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Abstract

Background

The provision of high quality medical and surgical care is predicated by high quality education and training. This enables staff to respond more effectively and flexibly and is crucial when considering the various factors impacting upon the delivery of patient care. The development and training of all healthcare students and staff is an important factor in ensuring patient safety and self-satisfaction, and relies on understanding the needs of learners as well as the way in which they learn. This fundamental training and education is no less pertinent in the perioperative environment, where high impact interventions are performed by Operating Department Practitioners (ODPs), and where patient safety and the quality of care must be paramount. This is due to the often difficult and potentially dangerous surgical and anaesthetic interventions on elective, unscheduled or critically ill patients.

Aim

The aim of this programme of research was to investigate the effectiveness of ‘traditional’ lecture/placement provision in ODP education, resulting in the implementation and evaluation of a revised curriculum that integrates simulation-based teaching and learning for this group of allied health professionals at the University of Portsmouth.

Methods

This programme of research used a mixed methods QUAL + quant approach on multiple purposive and convenient samples of ODP students and placement education managers. Drawing on phenomenographic methodology, the interpretivist studies used semi-structured interviews and focus groups to investigate the understanding and perceptions of learning from those with relevant lived experiences. Furthermore, a positivist study was conducted to analyse and further understand the effectiveness of different teaching methods. The results from these
studies informed a revision of the traditional ODP curriculum, based upon a nursing conceptual framework that included the integration of simulation-based learning.

**Results**

A total of five studies were conducted, beginning with individual semi-structured interviews with 12, second year ODP students investigating perceived enablers and barriers to traditional learning using lectures in University and placement learning in the hospital environment. Study Two continued with a positivist study on a cohort of first year ODP students, which investigated the effectiveness of three types of teaching. The results of these first two studies informed a revision of the traditional ODP curriculum to integrate simulation-based learning. The revised curriculum was subsequently evaluated using focus group interviews and follow up interviews, with 30 first year ODP students. Finally, a focus group interview with 12 clinical educators that are responsible for the clinical placement learning for ODPs was conducted to gather their perceptions of the revised curriculum, and the clinical performance of the students. This led to the development of a conceptual framework to inform the integration of simulation-based learning into future ODP courses.

**Conclusions**

The results of this research demonstrate that simulation-based learning for this professional group of ODP learners showed an encouraging trend in its effectiveness compared to other teaching methods. The revised curriculum encouraged higher order learning and mitigated to some extent the challenges faced by the NHS and placement educators.

In addition, revising the ODP curriculum was evaluated positively by participants and clinical educators and tackled challenges such as inequity of learning opportunity and exposure to a diverse range of patient groups, that learners often face when undertaking learning on clinical placement. The conceptual framework designed to inform the curriculum identified specific areas for consideration when integrating simulation-based education into the ODP curriculum. However, further development and comparison of the conceptual framework reported here and a larger cross-university sample is needed to confirm its reliability and validity.
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Declaration

Whilst registered as a candidate for the above degree, I have not been registered for any other research award. The results and conclusions embodied in this thesis are the work of the named candidate and have not been submitted for any other academic award.

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List of dissemination outputs from this research

Peer reviewed publications:


Invited contributions in professional publications:


Peer reviewed publications in preparation:

Effective teaching and learning in allied health: A positivist study that compares three healthcare education methods.

Learning effectively: A qualitative study of the perceptions of clinical education managers in students’ application of theory into practice.
Barriers and enablers to learning and applying clinical knowledge: A qualitative study of second year AHP students learning through traditional educational methods.

Developing a conceptual framework for simulation-based education: Design and Implementation.

Conference presentations:


Invited presentations:


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<td>AED</td>
<td>Automated External Defibrillator</td>
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<td>CCGs</td>
<td>Clinical Commissioning Groups</td>
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<td>EWTD</td>
<td>European Working Time Directive</td>
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<td>HCPC</td>
<td>Health and Care Professions Council</td>
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<td>HEI</td>
<td>Higher Education Institution</td>
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<td>ILS</td>
<td>Immediate Life Support</td>
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<td>Local Education and Training Board</td>
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<td>ODP</td>
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<td>TTL</td>
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Chapter One

Introduction
1.1 Introduction to this programme of research

Residents and visitors to the United Kingdom (UK) are reported as being fortunate in having an organised system of healthcare provision, free at the point of delivery and without prejudice to those who require its services – the National Health Service [NHS] (Donaldson, 2009; Lakhani, Coles, Eayres, Spence, & Rachet, 2005). This is a conglomeration of organisations charged with commissioning, providing and regulating health and care services for all residents of the UK and visitors who require its services. The NHS has vast resources and significant capacity, but also an open-ended mandate to provide appropriate care. This presents numerous challenges that require constant addressing including: recruiting suitably qualified staff; continually educating an ever increasing and changing workforce; prevention of failures in care provision by learners and qualified staff alike; and continual re-invention to cope with new working practices and technologies (Bevan, 2006; Martin et al., 2003; Youssef, 1996).

The provision of high quality medical and surgical care is predicated by high quality education and training, enabling staff to respond more effectively and flexibly in the delivery of patient care (Pritchard, 2009; Rodger et al., 2008). In addition, education has been highlighted as a key lever of change to provide a solution to some of the challenges to the NHS, and innovation is reported as being required to improve areas of learning and care delivery that have, or are, failing (Department of Health, 2011a).

In response to this, the NHS is in the process of developing and augmenting how staff are educated to ensure that they have the appropriate knowledge, skills and experience to adapt to changes that these organisations face, whilst still delivering
high quality individualised patient care. Part of this change is to introduce innovative pedagogies, teaching and learning techniques such as simulation-based learning, online learning and continuous professional development (CPD) activities.

1.1.1 Challenges to healthcare education

Medical education is evolving at a rate previously unseen (Donaldson, 2009; Temple, 2010) and continues to face significant progression and modification (Department of Health, 2013b). Changes in the NHS are not only revolutionising the way in which healthcare is delivered to the public, but has implications for Higher Education and the qualification and training of those in the health and allied professions (Byrne & Smyth, 2008; Department of Health, 2013a; Health Education England, 2012).

The development and training of all staff is an important factor in ensuring patient safety and staff satisfaction (Bennett, 2003; Bevan, 2006; Boularias & Chaib-Draa, 2013) but it is the initial, pre-registration education of healthcare professionals who provide the foundations for enabling qualified staff to continue to develop throughout their careers (DeYoung, 2003). This fundamental training and education is no less pertinent in the perioperative environment for Operating Department Practitioners (ODPs), where high impact interventions are undertaken. Indeed, patient safety and the quality of care must be paramount due to the nature of often difficult and potentially dangerous surgical and anaesthetic interventions (Bradshaw & Merriman, 2008; CODP, 2013).

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1 Professionals refer to those healthcare practitioners that hold registration with a statutory body and have followed an internationally accepted programme or curriculum to attain such registration. This may refer to medics such as anaesthetists or surgeons; Allied Health Professional such as radiographers, paramedics or Operating Department Practitioners or nurses.
Recent headlines have questioned the notion that all carers care, and investigations, reviews and reports over the last decade have repeatedly highlighted failings in care provision, ranging from criminal intent to harm, to more subtle inadequacies including inappropriate organisational and professional cultures. Intentional harm, medical culture inadequacy or accidents have resulted in negative views of the NHS and often the staff therein (Department of Health, 2001a, 2013a; Donaldson, 2002; Harmer, 2005).

Closer examination of the NHS has identified individual and organisational systematic failures where elements of the NHS have been culpable for accidental death, injury or inappropriate treatment of dying patients being unveiled to the general public (Department of Health, 2013a; Gregory, Guse, Dick, & Russell, 2007; Greiner & Knebel, 2003; National Reporting and Learning Service, 2011; Reynolds & Kong, 2011).

1.1.2 Sustaining a healthcare workforce

The need to ensure an appropriate quality of care that is required for the sustainment of the NHS has created a need for clinical and medical evolution (Rothschild et al., 2006; Vozenilek, Huff, Reznek, & Gordon, 2004). Despite some prioritisation and protection of levels of healthcare funding by successive governments, sustaining safe and clinically appropriate services has, and continue to be, a challenge requiring continual learning and updating for all staff (Bevan & Robinson, 2005; Lakhani et al., 2005; Walshe & Shortell, 2004).

Healthcare staff in administrative, technical or managerial roles are all critical in ensuring that the delivery of care is appropriate to the needs of the patient (Department of Health, 2008). The NHS is one of the largest employers within the
UK, albeit dispersed across the country in a host of non-uniform and variably-sized organisations within, what purports to be, a decentralised managerial structure with flexibility to respond to local needs (National Audit Office, 2011).

The UK population has been nurtured to expect a healthcare system that provides such flexibility, as well as a recognised level of skilled and knowledgeable staff who provide empathetic solutions to very personal and often painful medical, clinical or surgical complaints (Bevan, 2006). There is also an expectation that timely individualised care should be provided as a priority to every individual, regardless of cost or time of the day and that harm should not befall the patient either intentionally or through negligence (Harmer, 2005).

Moreover, a range of measures such as patient choice and decentralised care, has potentially given service users more influence over the health services they receive resulting in expectations that are changing (Department of Health, 2011c, 2013b; Martin et al., 2003). This in turn has led to NHS workforce expectations also changing: Working together, Learning together - a strategic approach to lifelong learning (Department of Health, 2001b); The Skills Escalator - a model designed to improve patient services through delegation of roles and responsibilities (Department of Health, 2001b); and the Agenda for Change (AfC) - where pay is linked to work not title (Department of Health, 2004); are all initiatives that have transformed the nature of the healthcare workforce, raising expectations of staff to have access to life-long learning and career progression (Audit Commission, 2001). Statistics over the last decade (2003-2013) indicate that the healthcare workforce was up to 11 per cent of the total workforce in the UK (Skills For Health, 2003). The latest data reported in 2011 identified that this figure had dropped to seven per cent
of the whole UK economy (approximately 1.5 million headcount) (Skills for Health, 2011) presenting a huge challenge in managing such a workforce, ensuring the best service to users and the highest training and education for staff.

Besides these changes and challenges, there are other factors impacting upon the ability of the NHS to continue to deliver high quality patient care. The introduction of Modernising Medical Careers (MMC) in 2003 (Department of Health, 2003) has seen the traditional apprenticeship approach to medical training being replaced by a more structured form of training which will see doctors and other healthcare staff, although well prepared, less experienced (Department of Health, 2001a); conversely the pressure to ensure that staff working hours comply with the European Working Time Directive (EWTD) (Department of Health, 2009; Fairclough, 2008; Fell & Kuit, 2003; Gregory et al., 2007) has resulted in the development of new and extended roles in healthcare in order to achieve fulfilment of NHS objectives (NHS East of England, 2009) and the challenges that the wider healthcare sector faces.

1.1.3 Operating Department Practitioners: One profession amongst many

Recent audits of Operating Department Practitioners (ODPs) by the regulatory body, the Health and Care Professions Council (HCPC) identify that there are 11,000 ODP registrants within the United Kingdom (HCPC, 2013) who work alongside other healthcare professionals such as anaesthetists, surgeons and nurses. ODPs are specialist practitioners who work in the preparation of anaesthesia, specifically the anaesthetic environment and equipment; supporting the surgical team either as a scrubbed practitioner or circulating roles and caring for patients with often complex clinical, psychological and physiological needs post-anaesthesia. ODPs carry out these specialist roles within three interconnected perioperative areas (anaesthetics,
surgery and post anaesthetic care). ODPs are patient centred and ensure that care delivered to patients is individualised, appropriate to their needs and safe. In addition, ODPs communicate with other medical departments and wards to ensure the continuation of care when the patient leaves the perioperative area. Whilst it is a relatively unknown healthcare profession to the general public, the functions ODPs perform are integral to the care and protection of patients and as a profession are subject to the challenges and expectations that other healthcare staff face. ODPs have undergone extensive changes throughout the lifespan of the profession, as a result of an ever-changing NHS. This has caused the scope of practice – or what ODPs do to change and develop alongside the needs of the population. This includes developing new and safer methods of caring for emerging demographics of patients such as bariatric patients and those with mental healthcare needs.

Furthermore, the type of surgical and anaesthetic intervention has developed in line with advances in operating techniques, advances in surgical equipment and new drugs becoming available. There has also been a shift from an assistant role, supporting other professionals, to a more care central role, where everything that the ODP does must be patient-centred and safe. This has meant that the ODP has had to develop leadership abilities in line with a scope of practice that demands more autonomy and responsibility.

Other changes include development in the way in which they are taught, from a pure apprenticeship method of learning skills, through to vocational training (National Vocational Qualification) that developed these skills further into a wider scope of practice and more recently into a Diploma of Higher Education leading to registration with a focus on providing care to their patients as members of a multidisciplinary team. The challenges to healthcare education discussed above
directly affect the ODP profession as part of the wider healthcare workforce; therefore a need exists to research the methods and effectiveness of teaching this particular profession to explore what the specific enablers and barriers are to learning to become an ODP and whether or not new pedagogies such as simulation-based learning can support more effective learning.

1.2 Aim and research questions

The aim of this programme of research was to investigate the effectiveness of ‘traditional’ ODP teaching and learning and evaluate a revised curriculum that integrates simulation-based teaching and learning for ODP students. Developing the aim for this programme of research has led to the following research questions:

1. What are the reported enablers and barriers to learning for Operating Department Practice students?

2. What are the key parameters that determine whether or not the teaching method used leads to improved skills and knowledge acquisition?

3. What are the key parameters that determine whether or not simulation-based teaching encourages higher order learning?

1.2.1 Thesis content: layout and structure

This thesis continues (Chapter 2) by detailing the learning undertaken particularly by the professional subgroup of ODPs. It evaluates the foundations of learning gained in clinical placement and the Higher Education Institutions (HEIs) and the reported enablers and barriers of learning using divergent methods and approaches.

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2 Traditional curriculum refers to the validated professional curriculum at the University of Portsmouth that did not use simulation-based teaching and assessment techniques.
This is followed by a comprehensive literature review exploring and evaluating the reported uses of alternative pedagogies to teach the healthcare workforce, such as simulation-based learning. This will include an investigation of the accepted conventional methods of apprenticeship teaching, and shall introduce the mainstream theories that inform ODP education.

The evaluation of learning theories shall analyse how people are reported to acquire knowledge and skills, but also the strengths and weaknesses of particular ways of acquiring knowledge; four mainstream theoretical approaches to learning (behaviourism, cognitivism, constructivism and apprenticeship/situated learning) are explored. Finally, the literature review frames and justifies the refined research questions and investigates how individuals understand (or report to understand) a phenomenon.

As figure 1 shows, Chapter 3 provides a description and justification for the overall mixed methods design for this programme of research including the positivist and interpretivist approaches, and the use of phenomenography as a methodology to gather and analyse data for the qualitative studies undertaken. Phenomenography aims to answer questions from the participants’ perspective and provides understanding of why phenomena occur. Finally, phenomenography is justified as the most inclusive approach by offering the potential to avoid limitations of other approaches such as grounded theory and phenomenology, by taking the stance of an experiential or second order perspective.

Chapter 4 continues with the presentation of the first study, designed to elicit the perceptions and views of second year ODP students on the enablers and barriers of learning following a traditional teaching and learning curriculum. Study Two follows,
which builds on the results of the first study and reports on the quantitative (positivist) data elicited from a first year cohort of students, and seeks to place ODP learning within the context of the wider literature through the measurement of three educational methods. This study compares traditional classroom-based learning, part-task training and simulation-based learning, on undergraduate ODPs. The results found in Study Two triangulated and confirmed the results of Study One and led to the revision of the traditional ODP curriculum, which included simulation as a theoretically supported pedagogy.

Chapter 5 presents three qualitative studies, two of which investigate if the implementation of simulation-based learning as part of the revised ODP curriculum is a valid and reliable pedagogy. The final study (Study Five) was a focus group with clinical education managers and compared traditional and revised curricula, identifying important managerial and learning considerations for these participants and this group of ODP learners.

Chapter 6 provides the overall discussion of this programme of research in context to the original literature review and the results found from each of the five studies; there will follow the contributions to knowledge that this research has made, whilst acknowledging the scope and limitations. Finally, there will be a summary and conclusion, which will consider the wider implications of the findings, and shall include any appropriate recommendations for further research.
1.2.2 Intended contributions of this research

Current literature relates to learning in a range of healthcare professions, but does not include ODPs, and is often based on anecdotal evidence or individual case studies that may not be directly transferrable to this profession (Birch et al., 2007; Bradley, 2006; Das & Townsend, 1998; Forest, Taylor, Postlethwaite, & Aspinall, 2002).

This programme of research is intended to make a contribution to knowledge in respect of curriculum design, evidence based application of mainstream learning theories and the use of new pedagogies in ODP education. It specifically focuses on simulation-based learning compared to the current (and historical) method of HEI/placement learning for ODPs and is a field that has yet to be researched. Furthermore, it is anticipated that this research will offer direct results to the wider community of educators who use or intend to use simulation as a tool for education in similar allied health professions such as Paramedic Science, Radiography, Physiotherapy, Nursing and Medicine.
The overarching aim of this programme of research is to evaluate a revised curriculum that integrates simulated teaching and learning for ODP students.

**Research Questions:**

- What are the reported barriers to learning for Operating Department Practice students?
- What are the key parameters that determine whether or not the teaching method used leads to improved skills and knowledge acquisition?
- What are the key parameters that determine whether or not simulation-based teaching encourages higher order learning?

**Study One:** a study of enablers and barriers to learning

**Study Two:** a randomised controlled study investigating the effectiveness of three teaching methods

**Study Three:** a qualitative study of first year ODP students’ attitudes and perceptions of learning through a revised curriculum

**Study Four:** investigating the perceptions of learning by first year ODP students six months into the revised curriculum

**Study Five:** investigating attitudes and reflections on student ODP performance from the perception of clinical educators

Figure 1: Illustration of the five studies conducted for this programme of research
1.3 Chapter summary

This chapter has introduced the challenges that the NHS and the wider healthcare workforce faces, and has set the focus for this programme of research by providing the background information and context. Included in this chapter is a rationale for the need to conduct such research on this ODPs, including intended contributions. This chapter has discussed the departure point for this programme of research by briefly introducing some of the challenges facing the NHS and the challenges of educating this workforce.
Chapter Two

Literature Review
2.1 Introduction to the literature review

This objective of this chapter is to discuss the literature that relates specifically to the aim and questions that inform this research. The review of the literature provides the foundation, overview and discussion of knowledge most relevant to this research (Aveyard, 2014). As such, this chapter examines the current knowledge regarding the reported uses of simulation and it’s evaluation as an effective pedagogy. Types and value of learning reported to be in use for medical (surgeon / anaesthetist) and allied health professionals such as radiography, paramedic science and social work shall be investigated, incorporating the theory that supports the divergent methods of learning between the HEI and clinical placement.

The literature review therefore, investigates four key areas, representing:

1. The professional evolution of operating department practice
2. Divergent methods of teaching and learning for healthcare learners
   a. Learning in placement
   b. Learning in the HEI
3. The emergence of simulation as a pedagogy for learning in healthcare
4. Analysis of mainstream learning theories for learning in healthcare

Understanding the characteristics of Operating Department Practice and how the profession has evolved to the extent that it has, is fundamental to the rest of this thesis and is therefore at the beginning of this chapter.

Place and method of learning is a complex area that falls into two divergent areas for allied healthcare students including ODP students: learning in the HEI and practice learning on a clinically appropriate placement.
Therefore, the second part of this literature review shall introduce and examine the challenges of each divergent learning area, drawing together the main themes identified within the literature.

The third section of this literature review shall discuss what simulation is and the extent to which it has been adopted as a method of teaching healthcare students, including analysis and evaluation of how simulation-based learning is reported to be in use.

Finally, a fundamental step towards exploring teaching and learning has been to examine the literature in relation to the methods of learning about a phenomenon, and the theories that support such learning (Watkins, 2000b). Determining certain natures of knowing are important, and exploring how best to use learning theory requires evaluation against the ontological learning strengths and weaknesses of this student group (Ashworth & Lucas, 1998; Sjostrom & Dahlgren, 2002).

Understanding the theory of learning is crucial (Skinner, 1950; Winch, 1998) to viewing the ODP educational experience as a whole, therefore examples of ODP education and their relationship with mainstream learning theories shall be discussed; but it shall be argued that each educational theory that impacts upon ODP learning is not entirely dependable or all encompassing. Therefore, the final section of this literature review shall introduce four mainstream learning theories that are reported to be consistent with learning in a range of settings.

It is anticipated that this literature review shall frame the questions for the research presented in this thesis and shall add new knowledge in light of existing educational methods and studies on similar healthcare groups.
2.1.1 Search strategy

A literature search was conducted (and reviewed) throughout this programme of research, consulting specific databases PubMed (1960-2014), MEDLINE via OVID (1966-2014), ISI Web of Knowledge, PsychINFO, CinAHL and Florida State University. These databases were searched with a range of inclusion terms and Boolean operators to refine the searches such as: Operat* Depart* Practit* simulation*, clinical, medical, educat*, apprentic*, simulat*, periop*, training, patien*, safety, placement learning, clinical learning in order to return articles specific to the research questions.

To further filter the articles that were returned there were exclusion criteria or ‘NOT’ categories used such as pharmacolo*, drug and comput*, in order to ensure that the search returned only articles with highly specific reference to the intended search. In addition, manual searches of reference lists of appropriate articles and book searches with detailed terms were undertaken.

The first step taken to critically analyse the published research included a review of the abstracts of each article to ascertain relevance to the subject (Hart, 2006). Papers that were not fully relevant to the search terms were discarded at that point. The discarded articles discussed and evaluated such subjects as anaesthetic computer simulation and modeling, pharmacological modeling, were not in English, about humans, or did not fully satisfy the original search terms, such as articles that were not peer reviewed.
The peer-reviewed articles returned included empirical part-task training studies, randomised controlled trials using part-task trainers, descriptive small-scale case studies of simulation, placement learning and quality of placement educators as table 1 overleaf shows. Other articles were editorials or personal accounts of using simulation to enhance learning. There were also reflections and individual case studies of learning events using both high or low fidelity simulators and environments, these papers were included even though bias on the part of the author is often a criticism of non-empirical research, particularly personal accounts or reflections (Alreck & Settle, 1994; Ashworth & Lucas, 1998, 2000).

Nine papers reported in this literature review acknowledge personal experiences or reflections of teaching and learning (Baillie & Curzio, 2009; Bamber & Tett, 2000; Birch et al., 2007; Bokken, van Dalen, & Rethans, 2004; Bond et al., 2006; Brannan, White, & Bezanson, 2008a; Brindley, Simmonds, Needham, & Simmonds, 2010; Clancy, Lindquist, Palik, & Johnson, 2002; Das & Townsend, 1998).

Whilst it is important to acknowledge such potential bias, this literature has been included within this literature review because many of the articles report similar findings in their studies. All of the returned articles were sorted and categorised thematically: learning in allied health professions, theories of learning, defining what simulation is, simulation as a tool for skill acquisition and assessment / transference of simulated knowledge and skill. As can be seen in Table 1 overleaf, only one study was conducted in the UK on midwifery students and this demonstrates the international lack of literature and therefore the need to investigate further, the use of simulation-based learning in the UK for ODPs.
Table 1: Matrix of literature reviewed relating to teaching, learning and assessment of simulation-based activities

<table>
<thead>
<tr>
<th>Study Reference</th>
<th>Methods</th>
<th>Results</th>
<th>Relationship to the research presented in this thesis</th>
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<tbody>
<tr>
<td>Birch, L., Jones, N, Doyle, P.M., Green, P., McLaughlin, A., Champney, C., Taylor, K. (2007). Obstetric skills drills: Evaluation of teaching methods. Nurse Education Today(27), 915-922.</td>
<td>This mixed methods study was conducted in the UK and was designed to replicate the initial psychomotor response to a catastrophic bleed in a pregnant patient by participants undertaking a one-day course that either used simulation (part-task training) lectures or a mix of both to educate the students. Sample size was 36 obstetric junior and senior staff, including medical and midwifery students. Participants were randomised into groups of six.</td>
<td>Focus groups identified that the students enjoyed the teaching and felt more confident up to three months after the teaching had been administered. Mixed method study design to measure the effectiveness of teaching method used using ANOVA. The authors identify that the results were not significant (p=0.086) due to the small sample size and therefore from this study there is not enough evidence to support a significant impact on teaching using simulation.</td>
<td>There is a confusing use of terminology, particularly in the unit of teaching methods (simulator or part task trainer or simulation) and refers to pure instruction or &quot;drills&quot;. The authors identified that the results of the study indicated an increase in participant confidence. Results derived from performance measurement and subjected to ANOVA indicate an improvement in performance pre/post test by the simulation participants that was higher than the other two teaching groups (who increased their performance marginally).</td>
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<tr>
<td>Cooper, S., Cant, R., Porter, J., Bogossian, F., McKenna, L, Brady, S., &amp; Fox-Young, S. (2012). Simulation based learning in midwifery education: A systematic review. Women and Birth. 25(2), 64-78.</td>
<td>This study compared the outcomes of simulation-based learning to traditional methods from 24 studies in midwifery. A systematic review of simulated learning and assessment of participants undertaking clinical emergencies. The review was based previous research that using Cochrane review principles, selected papers were analysed using Oxford evidence levels, CASP and published review guidelines.</td>
<td>Only papers that fell into categories 1-4 Oxford levels of evidence were included and that the focus was not on singular skills or equipment. The majority of papers met Oxford criteria 1b to 3b (n = 23) with 24 quantitative papers meeting the criteria for this review.</td>
<td>The systematic review focuses on skills on part-task trainers and not explicitly simulation-based learning for midwives and not ODPs. None of the studies selected that met the inclusion criteria were qualitative or mixed methods design. There is a clear methodology and transparent reporting of search methods and criteria used to select papers for review. Two independent researchers filtered selected papers against the inclusion/exclusion criteria. The authors recognise the methodological limitations of papers that met the inclusion criteria and identify that their research serves to answer the ‘how many’ questions and not the ‘why’; questions of simulation teaching effectiveness in midwifery.</td>
</tr>
<tr>
<td>Radhakrishnan, K, Roche, J.P., &amp; Cunningham, H. (2007). Measuring Clinical Practice</td>
<td>This pilot before and after randomised controlled trial attempted to identify the American nursing clinical practice parameters influenced by simulated learning. Comparison and evaluation of the participants of this study who practiced with the simulator, in addition to their usual clinical training had significantly higher scores than the control group (usual clinical</td>
<td>This study assesses safety mechanisms and basic patient physiological assessment. The control and intervention groups’ performances were similar in every other category. Whilst the results are encouraging it is unknown if this is transferrable to ODPs. The results provide a</td>
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- The clinical performance of 12 senior second degree participants was conducted that compared clinical learning alone versus clinical learning augmented with simulation learning, training alone) on patient identification (a subcategory of the safety category; \( p = 0.001 \)), and on assessing vital signs (a subcategory of the basic assessment category; \( p = 0.009 \)).


- An American qualitative study designed to evaluate the effectiveness of a computerized simulator system (ANAKIN) as a means for boosting neonatal resuscitation knowledge, skills, and self-reported confidence beliefs.

- Participants consisted of 60 third-year medical students who were recruited to participate and were randomly assigned to an experimental (simulated learning) group or experimental group.

- A randomised pre-test/post-test control group study design involving groups being assessed at an 8-month, post-neonatal resuscitation training interval to investigate teaching effectiveness, confidence of participants and knowledge. Standardised checklists were used to record performance and the results were analysed using *t* tests.

- Computer based simulation showing that knowledge level for both groups decreased significantly at 4 and 8 month, post-training intervals despite. Confidence levels for the experimental and control study group increased significantly (\( p = 0.000 \)) following booster exposure.

- However, no significant difference between study group performance levels at 8 months and no significant relation between neonatal resuscitation knowledge, confidence, or skills; Knowledge Test 1 (\( p = 0.927 \)), Performance Score 1 (\( p =0.841 \)), and Confidence Score 1 (\( p =0.071 \)).

- This study provides no evidence of higher order learning in this experimental population or retention of initial confidence, knowledge or performance scores at 8 months. The authors report that transferability to other professions is a severe limitation of this study and that the artificially controlled environment may be a factor that influenced the results. This provides a rationale for conducting Studies 3-5 reported in this thesis.
| Seybert, A.L., & Barton, C.M. (2007). Simulation-based learning to teach blood pressure to doctor pharmacy students. *American Journal of Pharmaceutical Education, 71*(3), 1-6. | This study assesses the effect of simulation-based learning on doctor of pharmacy students’ ability to perform accurate blood pressure assessments and to measure student satisfaction using high fidelity simulation. 102 American participants were taught blood pressure measurement using didactic lectures and practical sessions using a high fidelity simulator. Before and after written examinations were administered with 95 respondents (93%) and correlations analysed. Finally, participants completed a satisfaction survey regarding their learning experience. | This study showed significant improvement in the participant’s attitude towards undertaking and demonstrating accurately a single skill (blood pressure measurement). There was also improvement in procedural and functional knowledge demonstrated by the ANOVA results of the before/after assessment (pre-simulation 4.3 vs. post-simulation 4.4, p > 0.05). Participants were confident that patient simulation would improve their ability to measure blood pressure and their opinion changed little after the sessions. This study has a highly representative sample of the population it intended to survey. | Survey results indicated that students had a positive attitude towards SBL even before they had any experience with this type of learning. However, the authors discuss that the results demonstrate that ‘hands on’ learning in SBL prepares students for ‘real-life’ and this claim cannot be reasonably proved by this study. Furthermore, the authors do not discuss any limitations to their study or identify any cofounders from their sample group, which raises the questions of controlling for pre-learned or experiential knowledge from the participants. As an indication of transference of skill and improvement of a single task it is a useful study that is methodologically sound, however it is arguable that similar results would be found if using PTT instead of SBL and it is unknown if this is transferrable to ODPs. |
| Levett-Jones, T., Lapkin, S., Hoffman, K., Arthur, C., & Roche, J. (2011). Examining the impact of high and medium fidelity simulation experiences on nursing students’ knowledge. | This Australian study that measured and compared knowledge acquisition in nursing students exposed to medium or high fidelity human patient simulation manikins. Simulation requires a significant investment of time and money and in a period of economic rationalisation this investment must be justified. A quasi-experimental design was adopted which evaluated the effect of fidelity of Differences in mean scores between the control (medium fidelity) and experimental (high fidelity) groups for Test 1 t(82)=−1.233, p=>0.05; Test 2 t(75)=−1.386, p=>0.05 and Test 3 t(67)=−0.064, p=>0.05 were calculated using independent t tests and were not statistically significant. Analysis of covariance (ANCOVA) was conducted after two weeks to This study raises the question of economic viability of developing simulation-based learning, versus traditional teaching methods. It assesses knowledge acquisition for the participants and presents non-significant results. This study indicates that it would not be a useful use of resources to provide simulation-based education. However, other research purports enhancements in learning and confidence without statistical significance and this study does not measure such rubric. Therefore, a repeat study was desired to ascertain similar or non-similar findings and it should be replicated for ODPs. |

Simulated equipment in the acquisition of knowledge. Participants were drawn from third year nursing students with 84 participants who were stratified into two groups based upon their placement experience to control for the experiential learning variable. These two groups were then randomly assigned to either a control or experimental group. Knowledge acquisition was measured by the analysis of data collected from the participants pre-test and post-test using multiple-choice questions. This test was re-administered two weeks later.

determine whether changes in knowledge scores occurred over time and, while an improvement in scores was observed, it was not statistically significant $F(2, 74) = 11.01, p > 0.05$; and $F(2, 66) = 3.29, p > 0.05$.


A Danish prospective, controlled, randomised, single-blind, post test only intervention study testing effect on the learning outcomes of a 4-hour simulation-based, in hospital resuscitation skills course. They base the rationale for this study on the premise that simulation is ostensibly used for teaching students who find it difficult to attain "skills and procedures", particularly where such skills are rare in real life settings.

The results from this study showed that the intervention group demonstrated significantly more skill at the assessment than the control group (Intervention n=41; mean 82.8% 95% CI (79.4-86.2) control n=40; mean 73.3 95% CI (70.5-76.1)) with a statistic rating of $P<0.001$ and a large effect size (0.93).

This partially provided the method and concept for Study Two reported in this thesis. However, double blind, pre-test/post-test methods were used for the study reported in Chapter 4 as these were limitations of the Kromann study.


This UK study evaluated the need for specific algorithmic learning using simulated activities remote to the traditional learning environment. 'Satellite simulation' was utilised to test the effectiveness of environment as a factor to learning.

420 PICU staff were "refreshed": 340 nurses, 34 physicians, 46 respiratory staff.

The results from this study show that using simulation as a method of learning deliberate practice was successful in terms of assessment as well as participant speed in the psychomotor skill of CPR. Skill success was significantly less in FREQ (median 21 s, IQR: 15.75–30 s) than in INFREQ (median 67 s, IQR: 41.5–84 s; $p < 0.001$). Following this study was conducted over 4 months and demonstrated effectiveness in utilising a contextually rich and appropriate environment supports student learning. The results show that algorithmic learning was successful and forms the basis for repeating an algorithmic study reported in Chapter four of this thesis (Study Two).
| 909-912. | therapists. A consecutive sample of 20 PICU staff was assessed before subsequent refresher sessions. | actual resuscitations, CPR providers (n = 9) rated “Rolling Refresher” training as effective (mean = 4.2; Likert scale 1–5; standard deviation 0.67). | DeBourgh, G.A., & Prion, S.K. (2012). Patient Safety Manifesto: A Professional Imperative for Prelicensure Nursing Education. *Journal of Professional Nursing, 28*(2), 110-118. This American paper discusses patient safety and the development of innovative teaching and learning techniques to support this agenda. Confidence is highlighted as a key area for consideration when teaching students clinical skills and demonstrable knowledge. Developing confidence is as important as developing other safety mechanisms such as clinical skills and communication. This is not an empirical study and there are no firm statistics to support the development of confidence in what is deemed an ‘immersive’ environment. Therefore, the characteristics of self-efficacy and confidence require investigation specifically for ODPs. |
| Liaw, Sok Ying, Chan, Sally Wai-chi, Scherbier, Albert, Rethans, Jan-Joost, & Pua, Gim Gim. (2012). Recognizing, responding to and reporting patient deterioration: Transferring simulation learning to patient care settings. *Resuscitation, 83*(3), 395-398. The aim of this study, conducted in Singapore was to explore nursing students' experiences of how a simulation programme has prepared them to transfer their performance to clinical practice, in their encounters with deteriorating patients in ward. This was a qualitative content analysis study of fifteen participants. Each were interviewed following a simulated critical incident to evaluate transference of knowledge. Four themes emerged from this study relating the transference of knowledge: memory, mnemonics, recognition of similar situations and emotional responses. Two further themes were identified that were reported as being strategies to enhance learning in simulation. These were: Realism and self-directed learning. The findings provide an understanding of how a simulation program may impact on the nursing students' performances in clinical practice. Transference is crucial in supporting the economic cost of resources to support simulation-based learning. However it is unknown if this is transferrable to ODPs. |
2.2 The professional evolution of Operating Department Practice

In order to be able to understand the direction of teaching and learning that ODPs undertake it is useful to comprehend the changes that have occurred within the profession since its inception.

2.2.1 The operating theatre 1970s -1990s: a multi-skilled role

In 1970 The Lewin report published by the Department of Health suggested a new role encompassing a multi-skilled approach to staffing operating theatres (Department of Health, 1970) and that operating theatre staff should become practitioners. This role emerged from a long history of non-medical assistance in surgery. Since the 1970s specialised theatre education has moved on from hospital-based schools, using City & Guilds (for Operating Theatre Technicians (OTTs)) to the replacement with NVQ certification for Operating Department Assistants (ODAs) in the 1980s to reflect the emerging role and adaptation required to meet the increasing demands of the hospital. Training to become an OTT or ODA by following either the City & Guilds qualification or the NVQ system relied on in-house apprenticeship teaching and learning with assessment of competence. The NVQ system, in particular, relied on repeated demonstration of clinical tasks, which would then be signed ‘off’ by a qualified trainer until all competencies to perform the role had been completed.

The next evolution occurred in the early 1990s when Higher Education Institutions (HEIs) began offering the Diploma of Higher Education (HE) in Operating Department Practice programmes having recognised the need for a more robust
qualification, as there was a movement from a technician and assistant role to that of a practitioner. ODPs were now being referred to as being allied health professionals that ostensibly work within the perioperative environment (anaesthetics, surgery and post anaesthetic recovery), emergency departments and critical care (Lakhani et al., 2005).

There are 11,000 ODP registrants within the United Kingdom (HCPC, 2013) who work alongside other healthcare professionals such as anaesthetists, surgeons, emergency department staff and nurses. The ‘job’ or scope of practice for the ODP begins with patient care; ODPs are responsible for ensuring the holistic care of the patient is maintained in such specialties as anaesthesia, surgery, post-anaesthetic recovery, critical and emergency care.

2.2.2 Progression to regulation for ODPs

The progression and development of ODPs has evolved over the last 45 years leading to statutory regulation and standardisation of this workforce. In October 2004, ODPs became the first additional professional group to be included in the then, newly formed Health Professions Council (HPC3), the regulatory body for 16 professions.

Professional regulation has not been exempt from change to how ODPs practice. For example, the disciplinary powers of the HPC are far more extensive than were those of the Boards at the former Council for Professions Supplementary to Medicine (CPSM), the previous regulatory body. This professional regulation has meant a continued emphasis on the adherence to, and demonstration of,

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3 The HPC subsequently became the Health and Care Professions Council (HCPC) in 2013 reflecting the inclusion of Social Workers in England onto the register.
occupational standards; benchmark statements; standards of proficiency; education and training and continuing professional development (CPD) (HCPC, 2007, 2012), therefore, changing the profession and how to teach and assess such standards to ODP learners.

Collectively, these standards inform the education and development of an ODP to the point where they are assessed as fit for purpose, fit for practice and fit for academic award. Any failure to comply with these standards could result in the (now) HCPC, convening fitness to practice investigations against any registered healthcare professional from the 16 professions that it regulates, that has contravened the standards (HCPC, 2003). Mandatory registration has encouraged scrutiny of the profession and forced transparent accountability and change, including random biennial audit since 2008. This audit process requires the registrant to demonstrate and declare continual professional development in line with an evolving scope of practice.

Traditionally, achieving registration by passing an ODP course and meeting these standards as an ODP has relied on divergent methods of teaching students, since 2009 this mandatory accountability has become more of a challenge with the implementation and development of new strategies of education. Traditional learning methods have been reduced due to patient choices and clinical time constraints requiring innovative methods of teaching to be introduced (Department of Health, 2011a).
2.3 Divergent methods of teaching and learning for ODPs; the first divergent: placement learning

This section of the literature review discusses the findings of relevant studies in relation to learning in a clinical environment. Reported strengths and challenges to learning on placement from the learners’ perspective and the role and expectations of the clinical educator shall be discussed.

2.3.1 Background to placement learning

Learning in placement is a core ODP curriculum component, designed for the acquisition of clinical knowledge and skill in a contextually appropriate setting. The key area to be investigated in relation to placement learning is, what are the reported enablers and barriers of learning in placement? Essentially this question is concerned with the wider perspective of different health professionals and their reported experiences of learning within a placement setting.

Clinical placement learning is described as a powerful method of transferring information to a student and facilitating both formal (instruction) and informal (observation) channels of learning (Brown et al., 2011). Moosavi, Fatemi, and Yazdanipour (2013) claim that it is often seen as a mutual partnership that infers responsibility of learning from all participants and where participants engage in practice, observation, participation and performance.

Hands-on practical learning is viewed as critical in preparing healthcare professionals for the workforce; yet, four studies that investigated the effectiveness of placement learning (see Brown et al., 2011; McAllister, 2005; Rodger et al., 2008; Smith, Corso, & Cobb, 2010) identify a global shortage of adequate placements for these learners and argue that such shortages are universal, compounded by staff
shortages, patient availability and increasing competition for clinical learning from different professions. These challenges are the same for all students competing for suitable placement learning such as ODPs, nurses and radiographers, but extend to the staff that teach or assess these learners who are under pressure to care for patients as well.

2.3.2 Effective placement learning

Effective placement learning is reported to require the availability of placements that are congruent with the student learners’ level and needs; fair; safe; well organised and appropriate (in terms of health & safety, staff skill mix etc.) (Brown et al., 2011; Chan, 2002; Hamshire, Willgoss, & Wibberley, 2012). Studies that investigated learning in placement and the learning experience for students identify different criteria required for a satisfactory placement learning experience. For example, a study by Hart and Rotem (1994), discovered that there are six factors that describe and categorise a clinical learning environment and the students’ learning potential therein. Participants in their study identified that the areas of importance were: autonomy and recognition, role clarity, satisfaction, quality, support and opportunities. Conversely, Papp, Markklanen, and Von Bonsdorff (2003) found that student nurses and medical students report that good clinical learning requires five necessary elements: appreciation, support, quality, patient care and self-directedness. Papp et al. (2003) discuss students identifying with the quality of clinical placement learning opportunities in relation to these five elements and the ability to learn on placement are dependent upon these. In addition, participants of both studies identify that self-directedness and autonomy are also important factors.
These studies infer that for placement learning to be effective, thought and planning must go into developing the environment but without the reliance on apprenticeship learning and whilst adhering to safe patient care needs and the EWTD.

These studies do not refer to the expectations of ODPs or their needs in regard to placement learning. Therefore, it is unknown if the enablers and barriers that the studies above discuss are applicable to ODP adult learners or whether the ability for ODPs to learn is dependent upon more than exposure alone. If understanding ODP education is to be achieved it is crucial that placement learning is investigated in this professional group.

2.3.3 Managing the learning experience: placement educators

Placement educators are the core teachers within many clinical environments and a term often shared between professions. Spouse (1996) claims that the PE is crucial in managing the integration of the environment to the skill set being taught and has the responsibility to befriend, plan, collaborate or coach the student. Evidence from five studies suggests that the function of the clinical educator is to empower the student to attain the necessary standard that they are trying to achieve (Biggs, 1999; Brennan & Little, 1996; Evans, 1999; Hart & Rotem, 1994; Papp et al., 2003). Crucial to this is that the student must believe that what they are trying to achieve is attainable and managing these expectations is, as Biggs (1999) explains, the constructive alignment of learning outcomes to opportunities and assessment. PEs are integral to the safe delivery of teaching for ODPs, but there are reported difficulties with effective assessment in clinical placement due to reliance of direct observation and subjective individual judgements as Ross (1988) discusses.
Furthermore, clinical assessment of the student can be influenced by the interpersonal relationship between the PE and student compounding the difficulties in the student demonstrating, as Miller (1990) explains, the know-how, show how and do, which he describes as a framework for clinical assessment, as shown in figure 2. This empowerment will lead to skill acquisition if the student believes in their success and the clinical educator encourages, supports and bestows this and is vital to professional development (and later autonomous care delivery) of the learner.

2.3.4 Failing to fail

Schon (1991) and Miller (1990) identify that many professions fail to adequately prepare people for the practice that they are going to later do, reflecting failures in the job of the clinical educator. Whilst no studies exist that address the clinical learning for ODPs there are four seminal studies which have evaluated the nursing profession (Luker et al., 1996; May, Veitch, McIntosh, & Alexander, 1997; Runciman, Dewar, & Goulbourne, 1998; While, Roberts, & Fitzpatrick, 1995) and conclude that newly-qualified nurses were not able to perform certain skills, identifying a failure in the assessment of competencies which were conducted in clinical placements.

This failure to perform taught skills reflects a traditional nursing curriculum that relies on placement learning to assess competence. Worryingly, the quality assurance mechanisms to ensure the achievement of the required standard for registration was not effective in identifying those nurse students who were not fit for practice, as detailed in the studies above.
The studies also identify several core themes: the first is that student expectations and reality of placement learning differ due to unrealised expectations; the second is that quality of the placement and affording learning opportunity are key motivators for success; and the third is that placement learning must be managed by an appropriate clinical teacher/educator. Finally, they infer that PEs are explicitly aware of the need to empower students and manipulate learning opportunities to meet the assessment needs of the curriculum.

Figure 2: Millers (1990) framework for clinical assessment

However, these studies do not discuss learning within a perioperative environment therefore it is unknown if these key themes are similar for ODPs learning on placement.
2.4 Divergent methods of teaching and learning for healthcare learners; the second divergent: learning in the HEI

Whilst a larger proportion of ODP learning is undertaken in the clinical environment it is also important to gain an understanding of the philosophy of the ODP curriculum, and how that translates to the theoretical teaching within the HEI and the preparation undertaken for placement learning. During the two-year curriculum, the students will undertake up to 68 weeks of clinical teaching and learning that is facilitated and assessed by registered practitioners within that clinical learning environment. They will also undertake up to 24 weeks of educational learning within the HEI, completing units of study matched and validated against the professional body curriculum and the standards of proficiency set by the statutory body for the profession (College of Operating Department Practitioners, 2003; HCPC, 2006, 2013).

2.4.1 Background to the traditional\(^4\) ODP curriculum

A key aim of HEI programmes is to develop, alongside the profession specific skills, a reflective practitioner with an understanding of broad principles of healthcare, which can in turn be applied in new and evolving roles (HCPC, 2003, 2007; Zhang, Thompson, & Miller, 2011).

As an adult population of learners (students must be a minimum of 18 years of age) it could be argued that ODP students fall into a theoretical category of andragogy. Andragogy refers to adult learners who are self-directed and psychologically able to motivate themselves to learn (Knowles, Holton III, & Swanson, 2005). Sometimes the theory of andragogy refers to adult learners older than 18 years of age however,

\(^4\) Traditional curriculum refers to the validated professional curriculum at the University of Portsmouth that did not use simulation-based teaching and assessment techniques.
chronological age is not necessarily the age where such psychological achievement is apparent (it could be earlier or later due to lifestyle choices such as access to education, need to work-to-earn, family or financial constraints) (Atherton, 2013).

Timmons and Tanner (2004) suggests that education for these groups of learners in the HEI setting promotes a team approach to learning, which reflects the nature of multi-professional clinical practice, a core element of the expectations of a registered ODP. However, effective learning requires practice and self-motivation of the learners (Entwhistle & Entwhistle, 1997; Marton, Carlsson, & Halasz, 1992). Considering this, curricula set in the HEI has an important role to play in the depth of learning that students achieve. Entwhistle and Entwhistle (1997) propose that students can achieve deep learning through the application of experiential learning and group work and those curricula and courses can be altered to accommodate these. In addition, factors such as teacher interaction, individual student characteristics (for example adult learners) and workload levels are important to the success of the learning experience.

2.4.2 Demographics of ODP learners and courses

Most current applicants for ODP programmes of study nationwide, are over the age of 18 with significant proportions between the ages of 30-40 (CODP, 2013) resulting in cohorts of adult learners (Field & Leicester, 2000; Hoare, 2006; Mc Callum, 2007).

The course is currently a Diploma of Higher Education; it is non-semesterised in most HEIs and runs over two calendar years (46 weeks per year). This presents significant challenges in being able to manage learning within study blocks at the HEI and redeeming failure where students do not keep up, or have to take time off
for illness or personal matters, as there is little free time within the curriculum to manage such occurrences.

To be successful and to have the right to apply for registration with the HCPC after the two-year programme, the student must have completed a minimum of 3,000 programme hours in a variety of clinical specialties, completed all units of study (and passed all artefacts and assessments therein) and completed a clinical skills portfolio. This is a challenge to the students in that failure may result in a withdrawal of future funding should they need to repeat failed units or artefacts.

**2.4.3 ODP course funding**

Another important factor for this ODP professional group is that direct course funding means that successful applicants have course fees paid and they receive a non-means tested bursary for the duration of their two-year course. This funding has historically been apportioned by Strategic Health Authorities [SHAs] either through secondment of staff members to the course or through direct full cost funding by the Workforce Development Directorate [WDD].

However, in 2013 this model of commissioning changed with the sunset review and re-organisation of the NHS (Department of Health, 2011c). Health Education England (HEE) is now the special health authority that governs healthcare and health education in England. Other changes include the transition of Strategic Health Authorities into Local Education and Training Boards (LETBs) (Health Education England, 2012) that are geographically split by borders throughout England).
There are 14 LETBs in England that commission education services in consultation with local Clinical Commissioning Groups (CCGs) (Department of Health, 2011b, 2011c). These LETBs still provide funding for ODP courses, recognising that there is a professional shortage of ODPs in the NHS and attempting to secure a consistent workforce for the future.

2.4.4 Learning in the HEI

The current educational philosophy of the ODP curriculum is that students become autonomous, self-directed learners, proficient in delivering evidence-based, individualised and high quality patient care as directed by the ODP curriculum (CODP, 2013). Programme design and delivery should place the emphasis on students acquiring learning strategies that enable them to develop an understanding of a complex body of knowledge of theory and clinical practice, in order to become lifelong learners. This is supported by studies such as Wallin, Meurling, Hedman, Hedegard, and Fellander-Tsai. (2007); Watkins (2000a); Wolters, Yu, and Pintrich (1996); examining the outcomes of learners in HEIs, and suggests that students should also develop as collaborative group learners, seeing knowledge from multiple perspectives and acknowledging different learning styles as they develop their academic ability.

The desire therefore, is to develop a competent, knowledgeable, adaptable practitioner who can translate the learned philosophy of care into practice and become safe, collaborative carers. The HEI must develop analytical techniques and problem-solving skills that can be applied across their employment in the operating theatre and critical care (Knowles et al., 2005; Kolb, 1984). At the culmination of their education, the ODP registrant should be able to evaluate evidence, arguments
and assumptions, reaching sound judgements, and effectively communicate within their sphere and evolving scope of practice. This is achieved in the HEI through theoretical study blocks delivering content relevant to the curriculum and repeated practice of basic communication skills.

2.4.5 The requirements of a ‘good’ learning experience in the HEI

Learning to become an ODP requires more than a theoretical HEI approach alone. Indeed, the fundamental requirements to this type of learning are the acquisition, integration and critical application of skills and knowledge gained from the totality of the educational experience (HEI/clinical placement) (Trigwell & Prosser, 1996) and that the skills, processes and attitudes of students, teachers and staff are fundamental to success (Bamber & Tett, 2000; Brennan & Little, 1996).

Studies that examine this learning process (Clouston, Westcott, Whitcombe, Riley, & Matheson, 2010; Hoare, 2006; Roodhouse, Bowley, & McKevitt, 2006) report that once initiated, the aim is to develop a learner in the academic and clinical settings, where progression from simple concept acquisition, to engaging in more complex clinical situations, is usually demonstrated both in terms of techniques and problem solving by the student and is shown above in Millers pyramid above (figure 2).

2.4.6 Preparing students in the HEI to learn on placement

Placement learning is key to applying the knowledge gained in the HEI and students should be prepared to enter this environment. Understanding the enablers and barriers to placement learning is vital if it is to complement and develop further the learning that students undertake at the HEI. For example, one quantitative investigation (see Brown et al., 2011) with a population of 548 allied healthcare
students elicited data on perceptions of learning on placement. The authors found that student satisfaction with their actual learning experience on placement was significantly affected by their prior perception of an ideal placement learning experience and conclude that good communication and honesty in managing student expectations is crucial to achieving sound placement learning. This study did not involve ODPs but highlights the need for accurate and realistic preparation of the student, preparation that is historically managed through lectures on new students. Comparably, Papathanasiou, Tsaras, and Sarafis (2014) studied 196 nursing students and found that the participants reported a noticeable gap between their expectations and reality of learning whilst on placement, sometimes leading to attrition, poor feedback and a negative learning experience, again none of the participants were ODPs and is not necessarily generalisable for this profession.

The link between managing the students’ expectations and the actual placement learning experience is a consistent theme from these studies and is the responsibility of HEI and placement educators. Honesty in managing student expectations and quality of the learning experience are reported as key considerations, particularly in safeguarding patients and where failure to do so is likely to result in a poorly managed placement experience.

The challenges discussed above in relation to divergent ways of learning and enablers or barriers to learning in either learning area require further investigation to explore if ODP learners report the same experiences as detailed in the studies above. Understanding the perception of the ODP learner is crucial to this programme of research, as is ensuring a high quality HEI/placement learning experience and therefore success of the ODP learner and therefore informs the first research question.
What are the reported enablers and barriers to learning for Operating Department Practice students?

To answer this question an investigation into the actions that student ODPs perform, both in clinical placement and within the HEI was conducted and results compared to the literature. It serves to analyse the similarities or differences between the two learning environments and to identify the enablers, barriers and inconsistencies to student ODP learning.

2.5 The emergence of simulation as a pedagogy for learning

The next stage of this literature review is to explore what is known of simulation as a pedagogic approach and investigates how it is reported to be in use. Therefore, this section of the literature review discusses the background of simulation as an adjunct to learning and explores its reported effectiveness as a teaching and learning method. The main questions that inform this part of the literature review are: what is simulation-based learning? What is the evidence to support simulation as an effective pedagogy and what are the circumstances in which it is reported to be in use?

2.5.1 Defining simulation

The definition of simulation-based learning is contested in the literature, for example; Ganley and Linnard-Palmer (2012) discuss that simulation is an artificial or ‘hypothetical’ experience that engages learners in activities that reflect real life (p. 446). Bradley (2006) describes simulation as a series of activities to rehearse or practice a simple event or strategic series of events. Ensuring competence of medical professionals in placement learning environments, without ‘practising’ on
patients, has led to an increased use of simulation and part-task training methods of learning. Use of simulation in clinical education and training has increased exponentially since the 1960s (Bradley, 2006) and since the 1980s, simulation has been used extensively in the medical, (and subsequently) dental professions to facilitate the acquisition of practice-based competencies (see Aggarwal, Undre, Moorthy, Vincent, & Darzi, 2004; Bradley, 2006; Clouston et al., 2010) regardless of professional background, grade or specialty (Gisondi, Smith-Coggins, Harter, Soltysik, & Yarnold, 2004).

Other learning approaches that are afforded the term simulation include the use of:

- Low fidelity and high fidelity manikins (low fidelity generally refers to an inanimate manikin, high fidelity is discussed later);
- Games (physical or computer) that facilitate the rehearsal of events (driving a car);
- Part-task trainers which are models that represent a part of the whole to allow practice of a given task (cannulation arms);
- Multimedia programmes to support learning (surgical anatomy);
- Haptic systems and virtual reality (VR) for the recreation of environments (e.g. in teaching engineering students by representing three dimensional views of two dimensional drawings or rehabilitation of brain injury such as teaching kitchen safety to stroke victims);
- Simulated patients or real actors who “play” the part of a sick or injured patient.
(Bradley & Postlethwaite, 2003a, 2003b; Good, 2003; Good, Lampotang, Gibby, & Gravenstein, 1998; Ker, Mole, & Bradley, 2003; Merians et al., 2002; Zhang et al., 2003).

2.5.2 Simulation-based learning as experience

In addition, Crookhall, Oxford and Saunders (1987) define simulation as a real world event that represents a referent, which then draws its essential meaning from that referent; this could be interpreted as rehearsal of an event, not dissimilar to an actor practising their lines prior to performing on stage (Crookhall et al., 1987). When simulation-based learning is being undertaken it is expected that the participants will see it as a real experience; discontinuous with any other world or system and that suspension of disbelief is natural if the simulation is constructed appropriately. This view is supported by Hennemen et al. (2006; 2010) who also hypothesise that the use of medical simulation can assist with recovery of medical error through debriefing in a realistic, situated environment.

To test this (Henneman et al., 2006) conducted a retrospective study on 50 senior nursing students. They introduced the participants to two simulation exercises, which concentrated on assessing and treating patients for such disabilities as lung injury, congestive heart failure and complications of blood transfusion. The students were exposed to one of these three scenarios using a high fidelity simulator within a scenario (Crookhall et al., 1987). Fifty separate videos were made of the students on assessment and treatment these simulated patients and then were analysed to identify specific aspects of rule based error, knowledge based error and skills based error. In addition to the categorisation of these types of human operator error there was the recording should the student recognise one of these errors and intervene to
redress the error. By using high-fidelity simulation the outcome of error and intervention could be measured physiologically to identify outcome for the patient.

Two researchers separately retrospectively analysed the data footage of the 50 students and to explore an inter-rater reliability (95%) conducted additional separate analysis of five videos that were not used in the main study. The results from this study showed that all of the participants committed rules based errors which are a significant cause of patient injury and that whilst there were interventions to redress some of those errors, patient (simulated) wellbeing was affected. Since the students had already undertaken simulation previous to this study there were few errors in relation to knowledge errors because the students were not confronted with new or different scenarios and the skills required were quite limited (patient assessment and communication with patients and family which reported no significant errors or interventions).

The authors of this study identified limitations of the validity of the findings. They could not substantiate that what happened in simulation might also occur within the clinical setting. Importantly, Agazio, Pavlides, Lasome, Flaherty, and Torrance (2002) argue that it is far better to practice and fail in simulation rather than to practice these events in the real world where cost to life or equipment would be too high and unacceptable to undertake.

Therefore, patient safety must be at the forefront of the minds of healthcare staff, be they learners or qualified and registered staff members (Day & Smith, 2007; DeBourgh & Prion, 2012; Gaba, 2004). The desire of educators is to attempt to mitigate the potential for harm to patients, and teach staff how to assure patient safety through appropriate knowledge, skills and attitudes (Henneman et al., 2010;
Ironside, Jeffries, & Martin, 2009). Simulation is often heralded within the literature as one avenue that supports this by facilitating learning in a safe environment, one where the patient is not at risk of harm by the learner (Ironside et al., 2009; Kyrkjebø, Brattebø, & Smith-Strøm, 2006; Manser, 2009) and would be a desirable outcome for ODP learners.

2.5.3 Simulation and acquisition of knowledge and skills

For simulation-based learning to be an effective pedagogy it has to be demonstrably more useful than other teaching approaches, for example, knowledge retention would be a necessity and reflects the position of Entwhistle and Entwhistle (1997) discussed above in achieving deep learning by constructing a valid learning experience.

Birch, et al; (2007) attempted to address the issue of deep learning through the retention of skills by conducting a study that randomised 36 participants into a simulation group and a control group. This study was designed to replicate the initial psychomotor response to a catastrophic bleed in a pregnant patient by participants undertaking a one-day course that either used simulation (part-task training) or lectures to educate the students.

One finding in the study by Birch et al. (2007) was that the analysis of student focus groups identified that the students enjoyed the teaching and felt more confident up to three months after the teaching had been administered. Therefore, for these participants, the use of simulation as a teaching method resulted in increased student satisfaction but little else in terms of skill and knowledge retention. However, the authors identified that the results of the study did not reach statistical significance, and in that respect it did align itself to similar studies (Abrahamson,
Denson, & Wolf, 1969; Barr & Tagg, 1995; Barrie, Ginns, & Prosser, 2005; Brindley & Dunn, 2009). Criticisms of this study are that there is a confusing use of terminology, particularly in the unit of teaching methods (simulator or part task trainer or simulation) and refers to pure instruction or “drills” (p.916) that should be practised and suggest that practise will naturally facilitate an action that can be used at a later date. Neither did the study include a sample population of ODPs. Whilst it reports student satisfaction, this study does not produce tangible results in terms of longer-term memory or ability.

2.5.4 Success measured in post simulation performance

The use of simulation as a teaching and learning method is often measured as successful if participants are able to acquire knowledge or skills and perform such attributes at a later point in time. In an attempt to illustrate this, Cooper et al. (2012) conducted a systematic review of nine studies that compared the outcomes of simulation to other educational strategies such as apprenticeship learning, learning by rote or self-directed learning.

They found that knowledge acquisition of the simulation group performed significantly better in four of the nine studies (Aliner, Hunt, Gordon, & Harwood, 2006; Birch et al., 2007; Brannan et al., 2008a; Howard, 2007) with participants able to demonstrate much greater skills acquisition and ability to perform sequential clinical procedures than the non-simulation groups. Skill acquisition is only one part of the total learning experience for ODPs and is inherently the easier aspect to teach and for the students to learn. There were no ODPs included in the sample groups for these studies and so it is unknown if similar results would be reported.
The studies discussed above demonstrate the inconsistencies in results that are often prevalent in the literature with only 44% of the studies in the systematic review by Cooper et al. (2012) reporting success from participants in gaining knowledge and skills; a vital consideration when justifying the cost and benefits of such activities. In addition, there is a confusing use of terminology, particularly in the unit of teaching methods (simulator or part-task trainer or simulation-based learning) and reference to pure instruction or “drills” suggesting that practice will naturally facilitate an action that can be used at a later date. This is synonymous with muscle memory or repetition of tasks that facilitate conditioned responses (see behaviourism below).

A randomised controlled trial was conducted by Curran, Aziz, O'Young, and Bessell (2004) and involved a convenience sample of 60 third year medical students who were randomly assigned to an experimental or control group. The authors of this study found that following statistical analysis of the results (t tests), the experimental group had an upward trend in knowledge, understanding and performance over the control group in the post-test data. This was measured at the four-month and eight month interval post intervention. The results show development of participants but not to a significant level at the < 0.05 probability level between the mean scores for the study groups knowledge ($p = 0.927$), understanding ($p =0 .071$) and performance ($p = 0.841$) scores.

Whilst levels of statistical significance in the results were not reached the authors claim two important conclusions. The first is that a student’s self-belief was reportedly elevated and the second that observation over the term of this study (eight months) indicated knowledge and skill retention in participants. Both of these
conclusions are advantageous to the holistic approach to teaching students and are therefore, desirable.

Radhakrishnan, Roche, and Cunningham (2007) conducted a quasi-experimental pilot study that was designed to assess, through the use of simulation, several clinical competencies on second year nursing students. Students were taught patient assessment techniques, communication skills and recognising and treating illness in patients. The authors found that the intervention group performed significantly better in all three areas in the assessment of the students’ skills and ability in the tasks compared to the control group, although this could have been due to the simulated group receiving time to practice. The students in this pilot study who practiced with the HPS (in addition to their usual clinical training) had significantly higher scores than the control group (usual practice; clinical training alone) on patient identification (a subcategory of the safety category; $p = 0.001$), and on assessing vital signs (a subcategory of the basic assessment category; $p = 0.009$). The control and intervention groups’ performances were similar in every other category. Limitations to this study included the sample group comprising a small convenience sample limited to second year nursing students with some prior knowledge and skills; therefore the results are not generalisable. Moreover, they only conducted post intervention evaluation and not pre-intervention evaluation with no pre-existing comparable data to measure against. However, it is encouraging that this pilot study assessed aspects of learning other than skills acquisition alone with a recommendation that in a larger well powered randomised controlled trial or before and after study be conducted.
Conversely, Seybert and Barton (2007) undertook a study of 102 students who received didactic lectures followed by high fidelity simulation activities teaching the measurement and diagnosis of blood pressure. Statistical tests were performed on the participants’ assessment and the results showed a significant improvement in the participants’ ability when using high fidelity simulation as a teaching method. There are comparable results to these studies that are presented in other professions such as Medicine, Dentistry, Aviation and Psychology:

- Single psychomotor skills (Billings & Reynard, 1984; Butter, McGaghie, Cohen, Kay, & Wayne, 2010; Hutton, Kenealy, & Wong, 2008; Ste-Marie, Vertes, & Rymal, 2013);
- Physiology and anatomical management of injury (Birch et al., 2007; Clancy et al., 2002; Deering, Poggi, Macedonia, Gherman, & Satin, 2004);

Whilst these studies report some development across a range of participants, professions and subject areas in terms of skill acquisition, psychomotor ability and confidence, there are also clear limitations such as sample sizes, methodologies (post-test only) and sample groups that do not directly reflect working within a perioperative environment as ODPs would (Ross, 2012).
2.5.5 A costly pedagogy

Moreover, for simulation to be justifiable and effective for ODPs it would have to combine skill acquisition, non-technical skills such as communication, self-efficacy enhancement and evidence that simulation transfers into placement learning and patient care. A study by Levett-Jones, Lapkin, Hoffman, Arthur, and Roche (2011) attempted to justify the costs incurred in setting up a simulation facility by measuring the effectiveness of student nurses’ acquired knowledge when taught in simulation, versus a cheaper, part-task training facility. Levett-Jones et al. (2011) conducted a quasi-experimental study to evaluate the effect of the level of fidelity used in simulation on knowledge acquisition on 84 student nurses. Mean pre-test knowledge scores (Test 1) for the control group (medium fidelity) and the experimental group (high fidelity) were 11.833 and 12.523 respectively. The results from an independent t-test indicated no statistically significant difference between the groups based on these scores, \( t(82) = 1.233, p > 0.05 \); this ensured a relatively equal starting point for the study.

Mean knowledge scores for Test 2 taken immediately post intervention were 11.763 and 12.667 for the control group and experimental group respectively. The differences in these scores were not statistically significant, \( t(75) = 1.386, p > 0.05 \). Finally, mean knowledge scores for Test 3 collected two weeks after the intervention and analysed using MANCOVA were 12.806 for the control and 13.212 for the experimental group; although this indicated a moderate difference between groups it was not statistically significant, \( t(67) = 0.0644, p > 0.05 \) and the authors conclude that based on these results simulation-based learning was not economically justifiable.
2.5.6 Simulation and assessment of knowledge and skills

For simulation to be an effective teaching and learning resource it must match the conditions of assessment (Biggs, 1999). Kromann, Jensen and Ringsted (2009) aimed to test the relationship between assessment and retention of knowledge in simulation. They conducted a positivist trial that sought to test the effect of assessment on the students’ ability to not only learn in simulation, but also retain knowledge and skill and demonstrate that knowledge and skill in an objective assessment (Objective Structured Clinical Examination\(^5\) [OSCE]).

Kromann et al. (2009) argue that extrinsic assessment drives learning and this has an affect on the learning strategies that the individual will employ in a given learning event; a view supported by Schoonheim-Klein et al. (2006) who go further in identifying that assessment with feedback will elicit a further learning event. In addition to the extrinsic effect of learning and retention of knowledge and skill demonstrated via OSCE, they also report that this has a more subtle effect on the intrinsic memory of the studied materials by study participants.

To analyse the relationship between assessment and learning strategies, Kromann, et al; (2009) recruited 140 medical students, in their seventh semester of study, who had significant experience of learning within this profession and tested the effect of learning resuscitation skills during an in hospital course. Following recruitment the students were randomised to either the intervention or the control group to study resuscitation and following the four-hour intervention were invited to undertake an OSCE assessment (two weeks thereafter). Exclusion criteria to the sample were any participant who had undertaken any form of resuscitation training in the

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\(^5\) An OSCE is a method of assessing or examining a student’s knowledge and ability using a standardised checklist.
preceding six-month period and seems reasonable given the algorithmic nature of the subject.

The detailed profiles of the sample group were that 140 students were identified as requiring resuscitation training; these were split into the intervention and control groups (n=70 each). Ninety-six participants agreed to participate in the study, 42 refused and two were excluded. The rationale for this study is that simulation is ostensibly used for teaching students who find it difficult to attain “skills and procedures”, particularly where such skills are rare in real life settings as reported in other studies by Arthur (1998); Druckman and Bjorck (1991); Issenberg, McGaghie, Petrusa, Gordon, and Scalese (2005) and that simulation for these specific learning needs can be used to train students in these areas.

Over the period of the study a similar number in attrition was observed from both groups and the numbers undertaking the assessment were control group n=40 and intervention group n=41. The main study was preceded by a pilot which identified an effect size (ES) of 0.65, which would mean for the main study to achieve statistical significance the sample size would need to be 32 to identify an ES of 0.7 between the group means, a power of 80% and with a significance level of 0.5. The data collected from both groups in relation to the assessment was then subjected to a t-test and reported as a mean (95% CI). The effect size was measured using Cohen’s d calculation. The results from this study showed that the intervention group demonstrated significantly more skill at the assessment than the control group (Intervention n=41; mean 82.8% 95% CI (79.4-86.2) control n=40; mean 73.3 95% CI (70.5-76.1)) with a statistic rating of p<0.001 and a large effect size (0.93).

\[ \text{Cohen's } d \] is an appropriate method of exploring effect size for the comparison between two means.
The authors of this study explain that this significance demonstrates that by including assessment in small group simulation teaching has implications for both extrinsic and intrinsic mechanisms of learning, albeit short term (the data was collated from the assessment two weeks post teaching and assessment). They conclude that from this study there is a correlation between retention of knowledge and skill and thereafter performance if studied in simulation instead of traditional teaching and learning alone. Strengths to this study can be found in the design and methodology of participants and subsequent similarity in both control and intervention groups although in relation to the type of learning it is algorithmic in nature and does not necessarily adhere to the principles of deep learning and development of autonomy in response to a given resuscitation situation. This study was reported with clarity, demonstrating transparency in its execution and is useful for algorithmic learning.

There are similar findings reported in a study that examined deliberate practice and assessment. Clapper and Kardong-Edgren (2012) cite Niles et al. (2009) as conducting a 12-week study with 420 post-registration participants undertaking CPR assessment. The results from this study show that using simulation as a method of learning deliberate practice was successful in terms of assessment as well as participant speed in the psychomotor skill of CPR. Skill success was significantly less in FREQ (median 21 s, IQR: 15.75–30 s) than in INFREQ (median 67 s, IQR: 41.5–84 s; \( p < 0.001 \)). Following actual resuscitations, CPR providers \( (n = 9) \) rated “Rolling Refresher” training as effective \( (\text{mean} = 4.2; \text{Likert scale} \ 1–5; \text{standard deviation} \ 0.67) \) (Niles et al., 2009). It is however, unknown if this would be repeatable for ODPs and whether in vivo training or satellite training would be effective for this professional group.
2.5.7 Simulation in nursing

The Nursing and Midwifery Council commissioned 13 pilot site universities to undertake an exploration into the feasibility of using simulation to teach and assess nursing pre-registration students (Nursing and Midwifery Council, 2006). Thirty-four sites applied to participate in this major study, with 13 being selected and prepared for simulation-based learning activities. The rationale for this study was to identify if simulation could be used to greater effect for skills rehearsal and consolidation purposes (Bradley & Postlethwaite, 2003a; Nursing and Midwifery Council, 2007). One aim of this study was to explore if simulation was ‘deemed’ of use, and if so, student practice hours (which are an assessed component in most clinical and professional courses including nursing) should be used and recorded in simulation activities reducing the overall time spent in clinical hospital environments.

The design of this study mandated that the 13 programme providers use exactly seven days or the equivalence in hours to facilitate the teaching and learning of knowledge and skills to pre-registration nursing students using only simulation. This intervention was to be employed on each cohort (first, second and third year students) over a four-month period from September 2006 until January 2007.

Within the seven days allocated, students' were allowed to practice specific clinical competencies relevant to their level of study and then rehearse those competencies prior to going onto a clinical placement where it was anticipated that those skills and knowledge would be consolidated and practised. There was an expectation from the study designers that there would be automatic integration of theory and practice during that consolidation period within the clinical setting and that core skills such as
communication, decision-making ability and interpersonal skills would benefit as a direct result.

The results of this study were that the pilot sites reported significant and overwhelmingly positive results in relation to the aims of the project (Nursing and Midwifery Council, 2007). In specific areas of student satisfaction, the achievement of learning outcomes by participants and the fact that facilitated the practice of clinical procedures that were not readily available within the practice setting proved popular.

In addition, results inferred that there was difficulty in separating theory and practical learning in terms of what was actually learned by the students (Nursing and Midwifery Council, 2007). This is referred to in the post pilot report as hybrid learning, which combines theory and practice. The NMC (2007) reports that this has had implications on curriculum revision due to simulation not simply being for the purpose of learning practical skills, but equally, there was the opportunity to detect weaker students.

Following this pilot the NMC has implemented proportional learning time within their curriculum to the use of clinical simulation. The Nursing and Midwifery Council (2007) have indicated that up to 300 clinical hours of learning could be substituted with learning in a simulation-based environment.

Achieving 300 hours of simulated practice would mean each HEI requiring significant resourcing of equipment as well as staff to facilitate the learning; this was not discussed within the report. Although the report has led to the adaptation of the curriculum, it is not clear how this has been implemented or if all HEIs are following a standardised method to teach in simulation environments.
2.5.8 Constructive alignment of teaching and learning strategies

The literature therefore, infers that using simulation in assessment is successful if the curriculum or learning strategy is well designed. However, the contextual application of the assessments and the context in how they are applied is questionable. Biggs (1999) details a concept known as constructive alignment in relation to the objectives, teaching and assessment of students. In essence, constructive alignment highlights the necessity for a constructivist approach to teaching students and aligning the assessment to meet and appropriately evaluate the understanding of the students’ knowledge at a given time in relation to the original learning outcomes or objectives. This, he states, is being criterion-referenced assessment that achieves “the magic bullet” of teaching Biggs (1999 p.26). Often, the emphasis of education is to cover the curriculum, which could prevent the students from developing further due to the need of simply meeting the objective (Entwhistle & Entwhistle, 1997).

Evidence such as transference of learning in simulation-based activities to perioperative care and subsequent retention of knowledge for ODP learners is still required. In addition, if simulation were to be used to support ODP learning and address the challenges and barriers in relation to divergent learning methods, the ODP curriculum would require constructive realignment. Finally, the revised curriculum would require evaluation and comparison to the studies above testing its effectiveness.
2.5.9 Transference: higher order learning

The purpose of learning to become a healthcare practitioner is to be able to later apply such learning to a given real life situation with a patient, colleague or other service user and therefore try and improve care, treatment or outcome (Magill et al., 2010). Transference from the classroom must develop the learner and add to the body of knowledge that they shall later employ (Eraut, 2004a). For simulation-based learning to be effective, the ideas, structures, knowledge and skills learned therein need to be transferable to clinical practice in a way comparable at least to other methods (Domuracki et al., 2009) whilst being economically sustainable.

There are debates as to the effectiveness and ability for deliberate practice in simulation transferring to patient care, and the perception of transference of learned skills and knowledge from simulated learning in addressing the needs of patients in an environment with real safety issues.

Two studies examining transference of learning into care (DeBourgh & Prion, 2012; Liaw, Chan, Scherbier, Rethans, & Pua, 2012) suggest that there are many areas for consideration that can adversely impact upon transference. For example, Liaw et al. (2012) conducted a qualitative study on nursing students who attended simulation-based learning in treating a deteriorating patient. The participants were taught in simulation prior to experiential learning on placement and then asked to reflect upon their perception of transference from one environment into the other. Liaw et al. (2012) found that there were several themes that impacted upon transference of learning for this sample group and they include: memory, transfer tools (mnemonics), recognition of similar incidents to those rehearsed in simulation, dynamics of stress, feeling confident and feeling stressed by the situation.
In contrast, a study of 285 nursing students (DeBourgh & Prion, 2012) sought to identify if simulation using standardised patients could provide participants with a memorable experiential learning experience that transferred to clinical practice. The study replaced clinical learning with simulated activities that aimed to identify how to recognise the potential of a patient falling and how to prevent that incident: thus, hoping to demonstrate that simulation could replace experiential learning in this instance.

The results of this study conclude that the use of simulation to create a memory of a learning event were statistically significant with pre-post test aptitude scores demonstrating that knowledge, ability and skill in the participants being able to recognise and prevent falls in patients being more effective in the post test results. This study is an example of structured simulation being used on a large sample group being effective in the application of knowledge and transference of aptitude from one learning environment (simulation) into a clinical environment, addressing the requirement for experience and clinical experiential learning alone.

These are emergent studies that were published during this programme of research and address important issues that previous studies have not. The cost implication and justification for curriculum re-design and the use of expensive simulation facilities would be mitigated if the results of these studies were replicable for ODPs.

In addition, the transference and retention of knowledge, which is crucial to undertaking such curriculum change is reportedly successful in these studies. This suggests that if used correctly, simulated learning can address shortfalls of other learning methods for the participants. Therefore further understanding of the use of
and effectiveness for ODPs is required and this informs the second research question:

What are the key parameters that determine whether or not the teaching method used leads to improved skills and knowledge acquisition?

Central to answering this question is the comparison between ODPs and other allied health professionals who have reported successful learning in simulation. It raises questions such as: does this method of learning work for ODPs? Is it transferable to patient care? And could it be a solution to the difficulties in achieving clinical competence without always relying on patients to learn on?

2.6 Analysis of mainstream learning theories in ODP education

Having discussed the issues regarding the importance and limitations of learning within the HEI and on clinical placement, and the reported contexts and effectiveness of using simulation in teaching, learning and assessment of healthcare professionals, the central role of the next section is to explore how educational theories impact upon ODP learning. There are several theories as table 2 shows, with their own representative principles, which are related to ODP education.

For example, within the perioperative environment there are many different professions that focus their skills and knowledge on a diverse range of patients. Thus, ODP students interact with others and take part in apprenticeship and social learning.
Table 2: Four mainstream theories of learning Watkins (2000)

<table>
<thead>
<tr>
<th>Approach</th>
<th>Behaviourism</th>
<th>Cognitivism</th>
<th>Individual Constructivism</th>
<th>Social Constructivism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location of Knowledge</td>
<td>External to human mind</td>
<td>Internal to human mind</td>
<td>Internal to human mind</td>
<td>External to human mind</td>
</tr>
<tr>
<td>Meaning (individual)</td>
<td>Created via repeated association of a particular behavioural response with an external stimulus</td>
<td>Developed through the use of mental representations to make sense of unstructured phenomena</td>
<td>Constructed by the individual via environmental interaction</td>
<td>Constructed by social groups and appropriated by the individual</td>
</tr>
<tr>
<td>Description of Knowledge</td>
<td>Behavioural responses</td>
<td>Mental schema or representations</td>
<td>Individual constructions of the world</td>
<td>Social constructions of the world</td>
</tr>
<tr>
<td>Changes in knowledge by individuals</td>
<td>The result of environmental changes</td>
<td>The result of learning to apply a representation to similar or dissimilar phenomena</td>
<td>The result of changing individual needs</td>
<td>The result of ongoing development of social practices</td>
</tr>
<tr>
<td>Differences in knowledge by individuals</td>
<td>Due to different reinforcement histories</td>
<td>Due to variations in the complexity of mental representations</td>
<td>Due to different interpretations and conceptual abilities of the individual</td>
<td>Due to differences in social practice</td>
</tr>
<tr>
<td>Ontological assumptions</td>
<td>Dualist</td>
<td>Dualist</td>
<td>Dualist</td>
<td>Dualist</td>
</tr>
<tr>
<td>Particular limitations</td>
<td>Individuals are passive and uncritical, conditioned responses only, no conscious thought required</td>
<td>Source of representations are unclear</td>
<td>Individual constructions cannot be shared between individuals</td>
<td>Understatement and estimation of individual meaning; focus on social meanings and individuals respond uniformly</td>
</tr>
</tbody>
</table>

Therefore, *behaviourist* teaching techniques are used. Additionally, recognising that no two patients, anaesthetics or surgical interventions are the same requires *cognitivist* strategies to be developed and finally, as lifelong learners the theory of *constructivism* is implicit to the profession. Exploring the strengths and limits of each
theory requires evaluation and analysis in order to contextualise their use and to identify if they are effective in teaching ODPs.

2.6.1 Learning through apprenticeship and social methods

Allied health and medical professions, including ODPs are reported as employing a model of professional apprenticeship in order to allow exposure to a situation or environment (Eraut, 2003; Wenger, 1998). The student should become an active participant within their learning and if this is achieved, a process of socialisation will occur, or as described by Browns, Collins and Duguid (1989) as cognitive apprenticeship.

This apprenticeship method of teaching infers a one-to-one partnership (Eraut, 2003) with a master (clinical educator) and an apprentice (student). The master must be able to understand the intrinsic needs of the apprentice and develop the various layers of competence required. Students will learn by observing, being taught and coached and vitally by practicing within the authentic context of a perioperative environment.

One obvious challenge to cognitive apprenticeship, and a reason for its lack of popularity as a teaching method in healthcare is that authentic context belies patient care because the focus is on the student learning and completing assessments, rather than having total focus on the patient. It is up to the “expert” PE to ensure that patient care is not compromised in this instance, and if successfully managed, students aim to gain explicit knowledge and develop skills in communication as well as integrating practice and knowledge into clinical situations, under the exact conditions that they will have to apply those skills when registered (Eraut, 2004a; Spouse, 1996; Wenger, 1990).
This is something that simulation-based learning cannot compete with and so the social learning of students and the safety of the patients must be balanced, and given the challenges to the NHS and placement learning already discussed, this is a difficult balance to achieve.

2.6.2 The theory of social learning

Bandura (1977) developed the theory of social learning as a concept for students to imitate, after observing the actions of others, and suggests social learning theory will emphasise the roles “played by vicarious, symbolic and self-regulatory processes in psychological functioning.” (p. vii). Whilst discussing the theory of social development, Vygotsky (1978) adds to this by suggesting...

“…every function in a child’s cultural development appears twice: first, on the social level, and later, on the individual level.” (p. 57)

Although this theory is detailing child development, Vygotsky argues that child learning supplements adult learning. These definitions lend themselves to the concept of socialisation or enculturation of the student by the PE in the authentic and contextually appropriate environment and holds true of earlier views of behaviourist learning (see below). This view is discussed in a number of other social science disciplines including: Sociology (Dubar, 2005; Giddens, 1997; Parsons & Bales, 1956), and Psychology (Piaget, 1951, 1983; Rogoff, 2003; Vygotsky, 1978) and was a prevalent theme in the literature relating to placement learning above.

From an anthropological view, Linton (1945, p. 13) describes the “training” of the individual for a place in a particular society whilst Giddens (1997) discusses socialisation as a process of “cultural learning” (p.28) and identifies that the person will become self aware and knowledgeable in relation to the skills of the culture in
which they find themselves. Wenger (1998) discusses this concept further utilising the theory of situated learning by introducing the concept of apprenticeship and the exploration of a community of practice, and what motivates such a community (sharing experience and joint repertoire).

Certainly the notion of apprenticeship in a social learning context, following a master and learning, has one specific limitation for education in that the master is required to be exactly that, at the forefront of their respective profession and scope of practice. If the student (apprentice) follows a master who is not wholly knowledgeable; up-to-date; current in a range of skills and knowledge; and effective in the delivery of that learning, then the student may learn poor or out of date practice. The enculturation, i.e. the deliberate shaping of a person’s professional values and behaviours from their surrounding culture, could in that instance be erroneous, presenting further challenges when the student has to move into different placement areas, experiencing different masters.

2.6.3 Learning in a high stake workplace

Similar to other learning environments the perioperative area is a workplace with all of the usual constraints such as health and safety and workflow rules, but also with members of a multi-professional team who are focussed on caring and operating on a patient. Often, as Giddens (1997) suggests, students are expected to learn by becoming immersed in a professional culture in order to gain cultural learning but often this can be time consuming and at the expense of other experiential learning, particularly where students are often expected to demonstrate some usefulness before being engaged in learning. In contrast, Howe, Camion, Searle, and Smith (2004) argue that to some educators, the unpredictability of apprenticeship learning
is almost too risky to acknowledge because of the ‘wide variation in student opportunities’ (p. 328).

Therefore, student experiences are not uniform or consistent across a group. For example they may have exposure to the same specialties, but the experience of those specialties and what the student may see could differ. While the workplace may be an enriched context to learn in, some educators and learners may struggle with it as a learning environment because its primary function is not a learning environment but a workplace (Sandrioni, 1997). Learning therefore takes second place to work and in this context, care of the patient.

It is suggested from the literature that students will have different experiences depending on the patients and other healthcare workers they associate with when learning in placement. This limited attitude to apprentice-style learning is teaching-centred and assumes that all students will learn the same material if they are taught it. In the case of student ODPs this may not be the reality; for example:

- There may be limited time for the learner to experience a community whilst on a short placement within a specific operating theatre. This would not allow the opportunity for the student to realise legitimate peripheral participation or, in other words achieve enculturation, and may be a reason why students do not learn or achieve. This is opposite to traditional apprenticeship learning where one may be located in a learning environment for a long period of time.
- Additionally there is the issue of equality to consider amongst individuals and placement providers. The weakness is that placement educators may not be able to ascertain the students’ specific learning needs or styles in the time that is spent with them, resulting in a potentially flawed system of learning.
2.6.4 Behaviourism as a theory for teaching ODPs

Arguably, the scientific study of actions is known as behaviourism and Skinner (1987) states that it has its beginnings from psychologists such as Edward Thorndike (1913) and Ivan Pavlov (1923), amongst others, and is credited with being one of the first learning theories. Behaviourists such as Reynolds, Sinatra, and Jetton (1996) believe that in order to learn, students must be exposed to stimulus and reinforcement. Likewise, to gain knowledge and thereby develop meaning, the participant must be exposed to repetitive sensory stimulus. Watkins (2000a) develops this belief further, arguing that once this stimulus becomes second nature to the individual and therefore habitual, then they can develop meaning from a pre-determined cue.

2.6.5 Two perspectives of behaviourism

There are two main perspectives of behaviourism; these are classical and operant conditioning. Rescorla (1988) credits Pavlov with the discovery of classical conditioning referring to the participant receiving two stimuli, one arbitrary and one primary. The arbitrary stimulus (such as a bell ringing) is connected with an unconditioned stimulus, such as feeding. Feeding combined with a bell ringing would cause the participant to conduct the primary response (moving to a specific area of a room, salivating) (Marton & Booth, 1997). After a period of repetition, the arbitrary stimulus alone (bell ringing) causes the conditioned response (movement/salivation) (Hilgard & Bower, 1966; Rescorla, 1985, 1988).

Classical conditioning has two theories that take a diametrically opposite stance from each other. The first is the theory of stimulus-response [S-R] which relates to
the participant reacting to a stimulus without conscious thought and is a theoretical model of behavioural psychology (Rescorla, 1973, 1992). An example of stimulus response would be an ODP being asked for a surgical blade or suture. There is no conscious thought or debate required, the decision is out of their hands and so the action should be performed on cue without question.

The second theory is known as stimulus-stimulus [S-S], which Bredo (1997) refers to the participant reacting to an initial response but only whilst using cognitive thought and is a cognitive behavioural theory. For example, an ODP student observing laparoscopic surgery may witness unanticipated bleeding in the patient. At first this would present as the monitor that they were viewing simply turning red, indicating that the camera was engorged in blood. This would result in intense activity by the perioperative team, including rapid urgent communication by the scrubbed practitioner, opening new instrumentation and the surgeon commencing a laparotomy in order to stop the patient bleeding.

Future occasions where this happens often result in the ODP seeing red or hearing the same urgent communication from the scrubbed practitioner, and immediately responding to the situation, either opening new instrumentation or supporting the anaesthetist, depending on which role the ODP is performing, this represents the cognitive aspect of action. This is the learned response and is usually only experienced by student ODPS when learning on clinical placement.

The second perspective of behaviourist learning is operant conditioning. Skinner (1950, 1987) theorises operant conditioning as the alteration of actions based upon the conditions in which they are performed. This condition is ever-changing and malleable (Ferster & Skinner, 1957; Skinner, 1950). Operant conditioning relies on
motivators and punishments in order to condition the response or actions of an individual. These theories have been tested and reported using mammals such as rats and cats to identify stimuli that evoke a conditioned or unconditioned response in the subjects (Rescorla, 1973, 1992; Skinner, 1987; Thorndike, 1901).

2.6.6 Behaviourism in operating department practice

An example of operant conditioning in teaching ODPs is recognising and treating a patient requiring resuscitation, which is an algorithmic response to a condition presented by a patient. At a basic level ODPs are taught to respond to the clinical representation of the patient, if required the ODP may perform expired air ventilation or external cardiac compressions. If witnessed, the patient breathing for themselves would be recognised and the ODP would halt the expired air ventilation action, if a patient experienced a return of spontaneous circulation, then the external cardiac compressions would cease. Likewise, any punishment observed such as no change to the patient’s condition would result in the continuation of resuscitation until certain conditions are met, such as another taking over the resuscitation or a qualified practitioner halting the resuscitation as being futile.

As a theoretical basis for teaching ODPs behaviourism has strengths, but also collectively has three weaknesses. The first is that there is an assumption made of the ODP participants being passive and uncritical, simply meandering through the experience of learning (Bredo, 1997). However, this cannot be the case as adult learners are ready and motivated to learn (Knowles et al., 2005). ODP students have limited time in placement to develop and apply practical and theoretical knowledge. This is measured against a professional curriculum driven practice assessment document that the student and placement educator manage between
them. The student does not have the opportunity to be passive in their learning because of strict time limits set in each placement area.

Furthermore, negotiation between student and practice educator is required to explore opportunities for experiential learning in a safe environment. Where a student does not take control of their own learning they are likely to fail practice assessments because of the variation of PEs and learning that is not constructively aligned. Previous iterations of the ODP curriculum, where there were fewer pressures on attaining a clinical placement and a predominance of apprenticeship-style teaching, may be responsible for a meandering and uncritical learning experience. A student being led by the hand in such a manner is no longer appropriate to the professional ODP curriculum set in the HEI that is extant today, and is compounded with pressures on placement availability, placement quality and student expectations.

Secondly behaviourism relies on trial and error, experiential learning with or without conscious thought processes. This would require reinforcement or punishment throughout the learning process and new situations would form no basis for any comparison and so would leave the ODP at a loss of what to do. This method has an historical place in the education of ODPs and is present still today; it could be referred to as apprenticeship as discussed above. Another difficulty of total adoption of this theory is that it challenges the ethical treatment of patients, predominantly due to the fact that treatment of the patient becomes secondary to the learning experience and having to learn what to do on a patient whose care interventions are time critical belies any ethos of patient care.
Often there is limited experiential learning available and therefore learners have to practice on patients. Inevitably mistakes are made such as a cannula missing a vein. Whilst this is a very simple example of trial and error the outcome of failure is pain for the patient, stress, discomfort and a route for infection. Worse still is that the cannulation attempt would have to be made again, with most hospitals ‘allowing’ three unsuccessful attempts before a more experienced clinician takes over. For the learner making unsuccessful interventions on a patient, often the totality of learning is based upon witnessing the patient’s distress or receiving punishment such as withdrawal from being allowed to attempt further interventions or verbal chastisement and embarrassment for failing.

Finally, behaviourism as a theory relies on some form of stimulus words or actions to evoke response. Whilst there are similarities in the vocabulary of the generic ODP there is a wealth of differing surgical and anaesthetic specialities that would negate such stimulus. Furthermore, it is often difficult to communicate verbally due to the conscious levels of patients or physical barriers such as facemasks or ventilated scrub systems that cause excessive noise. During routine elective surgical procedures the surgical team often relies on non-verbal cues or instructions, which are often selective to a particular team who have worked together for a long time. This provides a challenge to new staff or learners where their experience of that particular team and surgical specialty may be limited to a few days.

There are potential strengths in using a behaviourist approach to learning if simulation is integrated as a pedagogic approach. Repetition or rehearsal as discussed in the literature above reportedly enhances skill acquisition and simulation can provide an effective and comparable method of learners’ exposure to specific clinical situations. In addition, students can be introduced to a clinical
environment in a safe way and practice the terminology and language required repetitively. The advantage being that learning exposure or experiential learning does not compromise patient care and can be managed for all students.

2.6.7 Cognitivism as a theory for teaching ODPs

Cognitivism takes an opposite stance to the theory of learning through behaviourist theories and is a philosophy where mind and matter are distinct or independent of each other and provides doubts, fears, hopes and thoughts (Descartes, 1651). Although cognitivists do not totally refute behaviourism (Scott & Marshall, 2005), they take the stance that the internal mind creates representations or symbols that evoke change through thought processes. Similarly to behaviourism the results of these thought processes can be measured using a positivist approach by measuring psychological outputs of the participants (acquisition of knowledge for example) (Chomsky, 1963). In this respect cognitivism was seen as ‘taking over’ the simplistic model of behaviourism with arguments relating to attention, memory, perception and thought being required for learning.

2.6.8 Making sense of phenomena

The theory of cognitivism assumes that the individual is able to make sense of new phenomena by making use of prior knowledge in whatever form (Hilgard & Bower, 1966). This requires the individual to engage with the world around them and form representations or symbols in relation to what is seen and understood. From here the individual processes information which will result in an action being undertaken, such as physical action (Marton & Booth, 1997; Vera & Simon, 1993). These actions
are vital to the theory of cognitivism because they determine the meaning of a phenomena (Watkins, 2000b).

Change of practice or position by an individual is evoked by a wider repertoire of internal representations or symbols being available as cognitive tools to be used in a given situation. For example, the longer a learner learns and understands their role and environment, the more internal representations are formed and the learner can begin to project or anticipate processes and related actions. Therefore it does not solely rely on trial and error as its foundation per se, but a greater emphasis is placed on self learning and development of mental representations (Bredo, 1997).

Dreyfus (1965) has been an instrumental critic of cognitivism because of the approaches used to explain mental states and the internal representation architecture. For example, cognitivism relies on the individual construction of a representation to confer meaning to a phenomenon and when faced with an unstructured phenomenon they (learners) will use an existing representation to give it meaning. The challenge is that there may be more than one representation already created that could “fit” a given phenomenon (Marton & Booth, 1997; Watkins, 2000b).

2.6.9 Altering perspectives of lived experience

One example would be to reflect on the term anaesthesia. In its simplest form it means ‘without feeling’ and a student ODP would recognise this term quite quickly (Gaba & DeAnda, 1988). As the student progresses and learns more they would realise that the word also refers to a method or type of achieving no feeling in a patient. They would learn that each time anaesthesia is performed, it is varied to the exact needs of the patient, and so no single type of anaesthesia ‘fits’ all patients. As
no patient is the same the ODP has to use their knowledge and think about the actions required to satisfy ‘anaesthesia’ for the whole range of patients. This is complicated further when matching the needs of the patient to the type of anaesthesia required for different types of surgery. The challenge for educators is ensuring that students have access to all ranges of anaesthetic learning, which as already discussed is unlikely on clinical placement.

In order to develop such representations the student ODP would rely on exposure to a clinical situation or placement activity. Both of these are subjective to the individual’s limitations, ability, moral stance, intelligence and the significance of that situation by those involved. As such, it is not objective or equal and therefore not a good method to rely on if teaching benchmark curricula for professional registration, which is what ODPs undertake.

In addition, and as previously discussed, access for all students, to all situations in the clinical placement learning environment is unlikely and therefore representations across a cohort of ODP learners would be different, resulting in altered meaning from similar situations to which the student is exposed. Therefore, a need exists for an objective and controlled learning experience, where meaning can be developed and accurate representations formed, which could address such shortfalls of cognitivism. Simulated learning may satisfy this need but requires investigation.

2.6.10 Constructivism as a method of teaching ODPs

The building blocks of clinical education have foundations in the educational theory of constructivism. Constructivists, such as Fox (2001); Liu and Matthews (2005) consider that this theory of learning has two main domains; individual and social. Individual constructivists argue that knowledge is always constructed by the
exploration and development of meaningful accounts of phenomena (Watkins, 2000b). These constructs take place when the individual assimilates knowledge, through the interaction with the environment that they engage with, and these interactions are then transformed into individual interpretations that develop meaning (Marton & Booth, 1997). Knowledge from this meaning is then individually and idiosyncratically constructed (Liu & Matthews, 2005). According to Gergen (1995) different participants will develop different meanings in given situations due to conceptual differences and abilities of the individual. Thus, changes in meaning are the result of personal interpretation of the situation and requirements. Therefore, constructivism differs from behaviourism by the lack of trial and error required, by instead using meaning as the building blocks of knowledge, brick by brick rather than all or nothing.

2.6.11 Higher order learning

Higher order learning is reached where assimilation of phenomena and learning results from progression through the learning experience (Piaget, 1983). Major contributors to this approach include linking the validity of knowledge with how it is constructed or created (see Wu, Hsiao, Wu, Lin, & Huanh, 2012 for a concise but informative introduction). Individuals can reflect upon performance and outcome and thereby accommodate the experience (genetic epistemology) (Piaget, 1951).

Radical constructivism (Von Glaserfield, 1995) relates to knowledge not being an object that is easily transferrable due to the individual sender and receiver of information having to interpret ideas based on their own experiences, and personal construct theory; examining how individuals construct and extrapolate a meaning from external phenomena through their own cognitive processes (Kelly, 1991).
Emphasis is placed on the individual developing meaning and offers a defensible basis for the creation of meaning (Fox, 2001; Glasson & Lalik, 1993; Prawat & Floden, 1994).

Whilst constructivism has a significant place as a theoretical and methodological approach to the education of ODPs it also has limitations. For example, the allocation of placement learning and the apprenticeship model of education means that exposure to adequate and equal experience cannot be guaranteed for all. Added to this the ODP curriculum in use at the HEI does not explicitly develop meaning and therefore cannot suitably facilitate the construction of knowledge that can be used in patient care. This can result in disparity in the process of learning and is evident when students fail to meet set course objectives at a given point in time.

2.6.12 Accurate meaning in learning

In addition, the meaning developed by the individual may not be wholly accurate, therefore not reducing the error consequence that is desired due to the potential misinterpretation of a learning event by a learner, or lack of exposure to a learning event. Individual constructivism can be further criticised. Firstly if knowledge of a given phenomena the sole product of an individual’s interpretation (possibly based upon an individual’s cognitive ability), then the question is how could it be possible for one to truly understand what another means ‘when engaged in communication?’ (Watkins, 2000a). Taken to a logical conclusion it would not truly be possible to share and communicate with another (Fox, 2001) because knowledge is not directly transmittable from person to person (Liu & Matthews, 2005) unless they have exactly the same experience on which to base new knowledge.
Individual constructivism also views all individual meanings of a phenomena as equal (Ogborn, 1997) which means that there can be no critical comparison of meaning (Watkins, 2000a). Whilst ODP students are adults it has yet to be researched if learning phenomena is shared or equal because it is not possible to assume similar experiences in life.

Finally, it does not offer an explanation of how an individual can adopt a more complex construction whilst still working at a less complex level (the development of learning through a cyclic phase of the ODP curriculum). So it raises a question of how could an ODP be accountable for his or her actions (as they have to be) when they may not understand what has been asked of them, based upon their mental processing of the phenomena that they have been exposed to? And how does that compare across a whole cohort of students in different placements with differing patient and clinical exposure?

2.6.13 Social constructivism—learning in a team

In direct comparison, social constructivists, such as Wittgenstein (2001), Vygotsky (1978), Daniels (1996, 2001) and Bandura (1977), propose that social group interaction, as well as the individual, construct knowledge. This means that the collaborators share any knowledge constructed socially and, as such, meaning is based in a specific social context. Knowledge is gained, and meaning developed through social participation and so is subject to a wider range of social, cultural and historical influences. Meaning develops through time, as practices change, or in the case of the ODP as clinical and theoretical knowledge and clinical ability evolves. Differences in meaning are ascribed to variations in social practice, as well as normative beliefs within the social group (Watkins, 2000a).
Major contributors to social construction theory include situated learning theorists (Vygotsky, 1978), social constructionists (Gergen, 1995), and other scholars (Berger & Luckmann, 1996; Kuhn, 1996). Common themes such as the social construction of knowledge is not inevitable just because there is a teacher and a student, and that the creation of artefacts of knowledge rely on more than one individual, form the foundations of social constructivism.

Whilst social constructivism plays a vital role in explaining the development and advancement of knowledge for the ODP (because of the shared repertoire and reification), there are limitations as a pedagogic approach. The first is that social meaning takes precedence over individual meanings. Within the perioperative field this can cause conflict, i.e. the team take a decision that the individual disagrees with but goes along with. Democracy in care is not always equal or based on individual knowledge, i.e. an individual may have more knowledge of a specific problem but is overruled by a democratic team decision. Although there are occasions where a democratic and equal decision making process is essential (such as a decision to cease resuscitation attempts on a patient).

Secondly, as the social meaning evolves, there is an assumption that the individual extrapolates the same meaning as the group or as Watkins (2000a) states “each individual sees these influences and responds to them in the same way as others” (p.8). Finally, social constructivism does not fully encompass, as Bredo (1997) describes, how individuals who inevitably belong to multiple social groups (family, hobbies, work etc.) consolidate potentially conflicting meanings (confidentiality, advice).
It is these limitations that do not lend themselves to the education of the ODP. For example, from a social constructivist perspective, knowledge, skill and practice for the ODP is constructed by engaging with the social practice of the perioperative environment, in a contextualised role, by caring and intervening with patients and other staff members. Whilst this theory fits with the practical component of educating ODPs it does not answer the question of parity throughout knowledge evolution for this group; nor does it fully answer how valid and reliable the knowledge constructed is.

2.6.14 Summary of learning theories in operating department practice

The learning theories presented above are the main methods of teaching in the HEI and on clinical placement for ODPs, however they are not exclusive to either this demographic of learners, nor to the exclusion of other theories. One limitation of applying learning theory is that often curricula are designed and theories can be extrapolated from them. That is, theory is implied and not explicit and this is potentially due to educators within the HEI being clinical teachers rather than educationalists.

The answer may be to employ a range of learning theory and make it explicit in how students are expected to learn, thereby adding to the constructive alignment of a revised curriculum. Each of the theories discussed above has a place in teaching ODPs and the learning that they undertake, a mix of theory that relates to each area of divergent teaching. It has been demonstrated in the literature that simulation has provided satisfactory results in facilitating trial and error, teamwork, assessment and the construction of knowledge, with or without theoretical frameworks applied.
However, research is required to identify if simulation could address the shortfalls and inequalities of learning to become an ODP and to justify a change in curricula for ODPs that validates outcomes. Outcomes such as participant self-efficacy, assessment, communication, skill acquisition, transference and learned response could enhance the student experience, transferring that experience to patient care, enabling an equal opportunity to learning and ensuring no harm befalls a patient through a student’s actions. It is this, which has informed the final research question for this programme of research:

*What are the key parameters that determine whether or not simulation-based teaching encourages higher order learning?*

Given that simulation can be expensive and require numerous resources, there is a need to separate out the pedagogic, organisational and operational risks and benefits in adopting this type of pedagogy. There is limited evidence to support higher order learning such as development of critical thinking or deep understanding (Fox & Mackeogh, 2003) using simulation. Therefore, this research question seeks to investigate whether simulation can support conventional HEI/placement learning techniques and if so what makes it effective, what resources are required to make it work, and is it worth doing?

**2.7 Chapter summary**

This chapter has presented a literature review, which began with an overview of the traditional ODP curriculum and has demonstrated some of the challenges that face education provision for ODPs and wider allied healthcare professionals in nursing
and medicine. Current research offers an insight into the professional curriculum for ODPs and the standards that have to be attained and maintained in order to practice as an ODP within the UK. The challenges of divergent teaching methods within and between placement and the HEI that are inherent within the professional curriculum have been discussed. As an approach to learning, there is no research-based evidence to support the organised use of simulation in augmenting placement learning for ODPs.

The review of research findings relating to the current use of simulation as a valuable pedagogy has identified inconsistencies within the literature. The term ‘simulation’ encompasses a whole range of learning activities and reportedly offers trained individuals the opportunity to practice skills required for rarely encountered emergency or clinical conditions to ensure that they attain competency and remain in good standing (Murray et al., 2002).

In addition, there are questions surrounding the efficacy of simulation versus cheaper skills-based techniques such as part-task training as well as the assessment of learners in this environment. All of these questions require answering specifically for ODPs as they are not part of the wider sample groups or identified within the current literature. Thus, before simulation is adopted as a method of choice for education programmes such as teaching ODPs, it is necessary to determine whether or not it can promote student learning and do so in a way that has a more lasting impact and benefit than other teaching approaches. This shall seek to address the challenges that healthcare education face and shall seek to explore further the effectiveness of investing in such methods of education.
Finally, the mainstream theoretical perspectives relating to learning have been explored and areas of strength and weakness relating to each of the learning theories have been identified.
Chapter Three

Methodology
3.1 Introduction to the methodology

3.1.1 Aim and purpose of this chapter

The purpose of this chapter is to provide an overview of the research methods used for the studies conducted during this programme of research as illustrated in figure 2. Five studies were conducted using mixed methods and according to Morse (1991) reflects a QUAL + quant mixed methods project; the five studies were:

1. Qualitative study of second year students undertaking a traditional professional curriculum
2. Quantitative study of first year students evaluating the effectiveness of three teaching methods
3. Qualitative study of first year students undertaking a revised University of Portsmouth curriculum that integrated simulation-based teaching
4. Follow-up qualitative study of first year students six months later
5. Qualitative study of placement educators’ perceptions of student performance undertaking the revised curriculum at the University of Portsmouth
Figure 2: Individual studies and intended contributions towards answering the research questions of this programme of research
3.2 Approach

3.2.1 Introduction to the research approach

Mixed methods research has been purported to offer a much broader view of a problem or question that requires an answer (Ostlund, Kidd, Wengstrom, & Rowa-Dewar, 2011) and was the approach selected for this research. Combining methods can be challenging due to ontological differences, therefore coherent reasons for using such an approach is required.

For example, the first study presented in this thesis was qualitative in nature and identified several barriers and enablers of learning. These findings were enhanced and illustrated further by the second study, which subsequently informed the direction of the third study, and so on. The rationale for conducting a mixed methods approach for this programme of research was due to the fact that data would be collected over several years or research phases, on different cohorts of ODP students; there was also a need to connect several studies in order to address the research aim and answer the research questions. Thus, the sequential gathering of data informed the direction of subsequent studies (Ames, Duke, Moore, & Cunradi, 2009).

3.2.2 Justification of a mixed methods design

Polit and Hungler (1999) define research design as the “basic strategies that the researcher adopts to develop information that is accurate and interpretable.” (p. 139). Within healthcare there are two main research paradigms that are frequently used: quantitative and qualitative. Both approaches were used for this programme
of research, with the specific aim of reflecting more methodological rigour (Alreck & Settle, 1994; Brannen, 1992; Clifford, Carnell, & Harken, 1996).

Mixed methods research is often described as the third methodological movement (Tashakkori, 2009). There are several definitions for mixed methods research that incorporate aspects of methods, philosophy, research design and process (Creswell & Plano Clark, 2011). The use of this approach aims to answer questions or solve problems, by having the researcher:

- Collecting and analysing qualitative and quantitative data in a rigorous manner, relating to the research questions
- Mixing and linking the two forms of data, by either combining the results, or having one set build on the other (as is the case for this programme of research)
- Combining the procedures into specific research designs that direct the plan for conducting the study

(Tashakkori, 2009)

There were several reasons to adopt a mixed methods design for the studies presented in this thesis, including: triangulation and greater validity, offset of findings from one study to the next, completeness of understanding the results of the whole research project, the investigation of different research questions, illustration of the views of participants and enhancement of the overall findings.

Triangulation and greater validity is the term used where both quantitative and qualitative methods are used in an attempt to mutually corroborate findings (Burnard, 1991). It is used in this programme of research to answer the questions of
similarity between ODPs and other professional groups that have been subject to research in different learning settings, including simulated learning.

Offset, on the other hand, recognises that each of the methods (quantitative and qualitative) have their own limitations; therefore combining the approaches would offset the limitations of each (Creswell & Plano Clark, 2011), providing a broader answer to the research questions and fulfilling the aim.

Completeness refers to exploring a more comprehensive account of what is happening in the research and aims to build a fuller picture (Bryman, 2006) of the data in order to provide answers to the studies in question. Different research questions are asked in this programme of research and therefore one methodological approach was not the best way of answering the questions. For example, the positivist study reported in Chapter 4 could not have been answered using interpretivist techniques and methods.

Illustration is where qualitative data is used to illustrate quantitative findings and this was the process used in Study Three, confirming and enhancing the findings of Study Two of this programme of research. Finally, enhancement infers that combining methods provides more comprehensive depth to the research (Bryman, 2006) the whole being greater than the sum of its parts.
3.3 Philosophical underpinnings of this research

3.3.1 Evaluation of interpretivist approaches to research

Qualitative or interpretivist approaches to research, subscribe to the view that the empirical world is studied from the perspective of the participants (Duffy & Watson, 2001). There are a number of strategies that can be used when undertaking qualitative research including:

- Grounded theory
- Phenomenology
- Phenomenography

Each of these approaches shall be briefly discussed with reasons for rejection as a methodology for this programme of research, apart from phenomenography, which was the methodology selected.

Grounded theory was developed in 1967 after the American sociologists Glaser and Strauss coined the title as a new qualitative approach that they used in their research on awareness of dying; it is cited as being a path towards theoretical discovery (Glaser, 2002; Glaser & Strauss, 1967). Unlike other qualitative approaches, grounded theorists attempt to generate theory from the analysis of the data that they extrapolate from participants and is described by Glaser and Strauss (1967) as:

The discovery of theory from the data systematically obtained from social research

(p.2)
Grounded theory takes an almost opposite approach to other qualitative methods by beginning with data collection which then forms codes, categories and later theory (Glaser, 2002; Misco, 2007). According to Creswell (2011), abstract theory or ‘process’ is grounded in the views of the participants of the study. This is similar to the desired outcomes for this programme of research in terms of reporting the views of the participants honestly. However, the research reported in this thesis is concerned with the investigation of learning to become an ODP, and not solely the development of new theory to inform teaching. For this reason, grounded theory was not considered for this programme of research.

In contrast, phenomenology emerged in the early twentieth century (Johnson, Long, & White, 2001). Edmund Husserl (1859-1938) is credited as the primary founder of this way of understanding the individual’s human experience (Maggs-Rapport, 2001). Phenomenology is described as being liberated from the relativism of historical and social entanglements (Blaikie, 1993) and has characteristics such as focusing on how objects and events appear to the consciousness of the beholder (Giorgi, 1999).

Furthermore, phenomenological analysis aims to explore relationships between acts, objects and meanings and describes essential meanings of phenomena. This is defined by Giorgi (1999) as being “that without which the phenomenon could not be what it is”. However, it does so through a first order perspective, a perspective that was not desired for this programme of research and as such, was discounted as an appropriate methodology.
3.3.2 Phenomenography: the approach adopted for this research

The qualitative studies reported in this thesis were informed by a phenomenographic approach to data collection, interview instrument design and data analysis. In etymological terms, phenomenography is derived from the Greek words “Phainemenon” (to manifest) and “Graphein” (picture or word description) (Pang, 2003). Phenomenography was first developed in Sweden in the 1970s in the field of education research and is the study of peoples’ experience, perception, apprehension and conceptualisation of phenomena, in aspects of the world around them (Marton, 1994). This entails the researcher adopting phenomenographic methods to attempt to see the phenomenon of interest not from an inward personal perspective, but from the perspective of the respondent.

In many respects, phenomenography resembles many other types of qualitative research, such as exegesis⁷, hermeneutics⁸ and phenomenology, relying on in-depth interview data and attempting to reveal understanding of a phenomenon from a text or verbal representation. Furthermore, phenomenography and phenomenology share their roots in Gestalt psychology (Marton, 1986; Saljo, 1996) but there are characteristics of each that distinguish them as separate approaches which are important to understand when approaching data analysis (Giorgi, 1999).

Phenomenography adopts a non-dualistic epistemology based on a fundamental rationale that the world and the person are inextricably linked through a person’s lived experience and metamorphoses dynamically where an individual participates in situations where a phenomenon is present (Sandberg, 2000). In such situations, an individual will engage in social and intellectual experiences of the phenomenon

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⁷ Exegesis is a critical analysis of written text, often referred to when analysing scripture.
⁸ Theory of interpreting and understanding linguistic and non-linguistic forms of communication.
and therefore will develop understandings of others as well as their own. As knowledge is based upon an individual’s understanding and experience of the phenomenon, learning occurs where individual experiences are different to those previously encountered (Watkins, 2000b).

From its roots in researching education, phenomenography has evolved into a research approach that aims to describe the world around us (Marton, 1981b). The use of phenomenography has spread from pure educational research into the world of medicine and the study of competence and human factors (Sjostrom & Dahlgren, 2002). Therefore, researchers who adopt phenomenography informed research attempt to describe, analyse and understand experiences of respondents through experiential description (Marton, 1981b) and seek to answer why questions. For example, early studies that adopted a phenomenographic methodology sought to answer questions such as ‘why are some people better at learning than others?’ (Marton, 1994; Marton & Saljo, 1976).

3.3.3 Ontology of the phenomenographic methods used

The terms associated with phenomenography such as: perspective, experience, conceptualisation and understanding, collectively reflect the totality of this experiential or second order perspective. Added to this, phenomenography does not differentiate between pre and post reflective thought, nor does it describe or account for the phenomenon being studied; but it does make statements to the respondent’s experience of the phenomena (Marton, 1986). Marton and Saljo (1976) identified that there were five distinct concepts of learning, these being:
1. Increasing knowledge
2. Memorisation
3. Acquiring factual information, schema, algorithms for practical application
4. Abstraction of meaning
5. Interpretation of process to understand reality

The fifth concept, reality, only being understood in a limited amount of ways, has been shown to be stable across other studies with or without an educational context (Alsop & Tompsett, 2006; Marton, 1994; Svensson, 1997).

Therefore, phenomenography takes an individual’s life experience or reality, as the basis or point of departure and acknowledge that phenomena could be understood differently by individuals and have a descriptive orientation (Giorgi, 1990) and is a crucial component of the research reported in this thesis.

Given the definitions of phenomenography and the experiential emphasis of the individual, this methodology is not concerned with making statements about the world (a first order perspective) but instead with making statements about the world as experienced by individuals (a second order perspective). It is these statements that are the object of phenomenography and phenomenographic research (Marton & Booth, 1997) and therefore, informed the methodological approach for this programme of research for two main reasons. Firstly, to understand the lived experience of the phenomenon of learning by those ODPs who have experienced it and secondly, to interpret and conceptualise barriers and enablers to learning, consequences of curriculum change and the effects of those changes for ODPs and clinical educators.
3.4 Strategy and research design

3.4.1 Data collection methods for the qualitative studies

Two separate methods were used to gather qualitative data from participants: semi-structured individual interviews and focus group interviews using open-ended questions relating to the research aim and objectives of this study. Care was taken to ensure that the structure imposed by following the interview schedules (see appendix 1-5) was not so prescriptive as to produce purely quantitative data (Pontin, 2002) which would not be as useful for these studies.

Semi-structured interviews used in the first study followed an interview schedule allowing for a degree of standardisation in the approach to the interview (see appendix 1) (Todres & Holloway, 2009), whilst also being aware not to stifle participant responses and allowing a degree of flexibility to pursue avenues of interest (Gerrish & Lacey, 2009). The choice of semi-structured questions that the participants answered were designed to elicit a rich second order perspective of the experiences of learning in a HEI setting, learning in a clinical environment and ways of learning and knowing from the student perspective.

Focus group interviews (FGIs) are defined by Powell, Single, and Lloyd (1996) as:

‘a group of individuals selected and assembled by researchers to discuss and comment on, from personal experience, the topic that is the subject of the research.’

(p.499)

They are discussed by Basche (1987) as a technique from the qualitative paradigm that can be used to elicit data about participants’ feelings and opinions in regard to a phenomena, problem or experience and was originally proposed by (Merton, 1946).
FGIs are useful when selecting homogenous participants, that is, participants who share relevance to the area being studied (Morgan, 1997) and offers features such as organised discussion and interaction (Kitzinger, 1994, 1995) as well as:

‘drawing upon respondents’ attitudes, feelings, beliefs, experiences and reactions in a way in which would not be feasible using other methods, for example observation, one-to-one interviewing, or questionnaire surveys.’

(Gibbs, 1994)

Such interaction was desired for data collection and therefore, FGIs were used for the qualitative studies reported in Chapter five (see appendix 3-5 for copies of the interview schedules).

As discussed, the methodology for the data collection and analysis of the qualitative studies presented in this thesis are drawn from phenomenography. Whilst it would be usual for phenomenographic interviews to be conducted individually, FGIs are not discounted and were deemed more appropriate for the studies containing first year students and clinical educators for reasons of social cohesion and providing a safe environment for these learners and professionals to express their perceptions, experiences and feelings.

In terms of phenomenographical analysis of the collected data, the use of FGI did not affect the process or indeed the analysed results. Each member of the FGI was given a separate confidential identifier and the resulting vignettes, once checked for accuracy against the recordings, were treated as individual units of data that were combined into ‘pools of data’ resulting in themes for ease of presentation.

The interviews were digitally recorded using an Edirol R-1 digital recorder; field notes were taken and later used to triangulate the data with the focus group facilitator (Basche, 1987; Holloway & Wheeler, 2000; Packer, Race, & Hatch, 1994).
The audio recordings from each interview were transcribed by an independent professional and hard copies of the transcriptions were prepared for analysis.

3.4.2 Qualitative data analysis methods

The primary aim of the data analysis was to remain true to what the participants said and provide credible and trustworthy findings (Burnard, 1991; Daniel & Onweugbuzie, 2002; McHaffie, 2000). This in turn provided in-depth second order views of the participants’ beliefs of whether or not simulated learning as a pre-junct to clinical placement learning was deemed useful to the year one cohort, and if so why? Conversely, what was their understanding of using simulation to support traditional teaching and learning methods and reflectively how did they understand or interpret these phenomena?

Saljo (1997) advocates the approach of data analysis to include immersion and concentration of understanding the conceptions. It is this approach that has been adopted for this data analysis as figure 3 shows. Bruce (1997) identifies that phenomenographic analysis relies on the relationship between the researcher’s understanding, the nature of the phenomena being studied and the style of available data. A crucial component of achieving the second order perspective is for the researcher to be able to ‘delve’ behind the data to find meaning rather than simply reporting the data. Walsh (2000) discusses this as achievable if data analysis is conducted across the whole of the data sets and not just individual transcripts.
Qualitative data can be analysed in a variety of ways (Miles & Huberman, 1984; Strauss & Corbin, 1990; Wolcott, 1990). Computer software (MaxQDA™) was used to manage the transcriptions from the participants of this study and the PI attended external courses to develop the skill required to use this software. MaxQDA is a Windows based data management platform that is designed to import text from a range of formatted documents (MS Word/rtf/.doc/.docx) and allows the user to identify specific text and drag it into a thematic folder.

Figure 3: Six-stage approach to phenomenographic data analysis (Svensson, 1997)
Text can be added to various thematic folders where there is crossover in meaning and notes can be added to text. Useful features of this software are its ability to illustrate relationships between data in a more meaningful way than simple word counts by displaying matrices and comparisons of different thematic folders. This allows for a rigorous approach to data analysis and transparency where different members of the research team triangulate findings.

In order to understand the true meaning of the participants’ thoughts, it was vital to become immersed into the data using both of the data collection methods (semi-structured and focus group interviews). Achieving this involved reading the transcriptions several times to gather a sense of ‘the whole’ (Ornek, 2008; Todres & Holloway, 2009). Each of the transcriptions was read and re-read to enable immersion in the narrative provided by the participant.

Field notes were read alongside the transcriptions to offer observational depth from the PI. Following each interview the transcripts were uploaded to a transcription service, with the instruction that they should be transcribed verbatim with the inclusion of the notes on mannerisms and gestures that had been made during the interview. Completing transcription as soon as possible after the interview allowed for a more transparent process because much could be remembered when compared to field notes alone (Polit, Beck, & Hungler, 2001). The digital recordings were then listened to and compared to the transcriptions to ensure the accurateness of the data to be analysed.

Variations of experiencing a phenomenon are crucial to phenomenographic research and are a result of the holistic reporting of respondents’ understandings of a phenomenon, following filtration to enable commonality in selection, delimitation
and organisation (Marton & Pang, 2005). Conceptions, or units of data, are found to have a logical relationship with one another (Marton, 1994) and based upon this logical relationship a hierarchy or ‘pool’ of conceptions can be arranged; for example a hierarchy of complexity. Categorisation of ‘pools’ of conceptions result in themes that define variations of an experienced phenomenon and can be defined as one of the different ways in which people make sense, or understand, their experience of that phenomenon (Sandberg, 2000).

As a hierarchy, an ordered set of themes is the instrument for characterising how well (for example in the context of this programme of research) students succeed in their learning task, from a qualitative perspective. Understanding how students understand a phenomenon, principles and concepts in a knowledge domain is central to a student’s mastery of that domain (Bowden et al., 1992).

Because phenomenography employs a non-dualist epistemology, the themes that resulted from the conceptions and categories of data reported in the studies are functional entities. These entities represent the inextricable relationship between what is perceived (the perceived reality) and how it is perceived (how the perceived meaning appears) (Sandberg, 2000). These are reported in each of the qualitative studies under separate headings with individual vignettes. An example of data analysis steps from the first study can be seen in figure 4 overleaf.
Figure 4: Specific steps taken when adopting the six-stage approach to data analysis

1. **Familiarise and Immerse yourself in the data**
   - Transcribe recorded interviews
   - Read transcripts along with audio recordings to confirm accuracy
   - Re-read transcripts to increase familiarity along with field notes

2. **Increase focus on conceptions, question the phenomenon**
   - Ask what is happening? why is it happening? is it a shared phenomenon amongst other respondents
   - What are the key meanings that are articulated? how do they relate to the field notes and interview schedule?

3. **Identify data as pools of meaning**
   - Identify relationships between concepts such as good, bad/right, wrong/happy, sad etc.
   - What are the shared experiences relating to each main theme? (learning/simulation/theory-practice)
   - What and how is the phenomenon perceived? why did these concepts become important?

4. **Sort pools of meaning**
   - Place concepts with similarity into piles—question what is the relationship between each?
   - Allow themes to emerge. learning (where?) good learning/bad learning (why?) perceptions of improvement (what?) Simulation (why?)

5. **Contrast groups of similar data**
   - Repeat the process for other transcriptions
   - What are the similarities/differences?
   - Are their relationships between different respondents or focus groups?
   - Link emerging themes from pools of data analysed together until data saturation

6. **Triangulate findings with another. Do they agree?**
   - Invite respondents to check meaning and clarify analysed themes against memory of interviews
For Study One (reported in Chapter 4 of this thesis) there were 12 individual semi-structured interviews and therefore 12 transcripts. Each transcript was read whilst listening to the audio recording to check for inaccuracies. There were no additions or omissions from the transcripts. A second researcher (PJ) followed the same checking process.

After completing this quality assurance process, each transcript was read until familiarised and the specific concepts relating to phenomena were identified. Concepts such as advantages and disadvantages (for the first study) to specific types of learning as well as barriers and enablers of each were identified and substantiated with field notes, see figure 5 for an example of data analysis.

The next stage involved repeating this absorption and immersion process for each transcript and then sorting the meaningful concepts into themes that encapsulated the respondents meaning. For Study One this resulted in three themes: simulation and curriculum change, learning in placement and theory-practice gap. The themes were confirmed for accuracy and interpretation by a second researcher, thereby facilitating credibility.

For Studies 3-5, a similar six-stage process was followed for each focus group interview and comparisons made between each of the focus group transcriptions to identify similar ‘pools of meaning’. The actual vignettes that demonstrate the similarity between respondents relating to learning phenomenon are differentiated in studies 3-5 by using separate identifiers for each respondent so that different respondents revealing similar perceptions to others could be compared to provide a range of experiences.
Figure 5: An example of data analysis from spoken word to theme

Vignette from transcription: ...it depends really where you are in placement...you get interrupted. I ask someone to explain something that’s just happened and it’s oh, alright we’ll just get this patient off the table or we’ll do it in a minute and then the conversation ends and it never gets followed on........

Explore the relationship between the participant and the concept—in the case above the student is discussing learning in placement and specifically a barrier to learning.

Why is this important? what is the meaning? this participant relates the barrier to learning as a consequence to learning in a workplace—get the patient off the table first.

What are other participants saying? are they articulating similar experiences and more importantly similar reasons of why this phenomenon is happening from their view.

Place similar articulated perceptions together to form 'pools of meaning'.

Contain pools of meaning into an overall theme for presentation purposes and clarity—in the case above this would thematically be 'disadvantages' to placement learning.
3.4.3 Data collection for the quantitative study

Study Two, reported in Chapter 3 of this thesis was the only quantitative study conducted for this programme of research, comparing three methods of teaching and the effectiveness of each on a random sample of student ODPs. The participants completed questionnaires prior to and post teaching, in addition to being scored on an assessment sheet undertaking two separate clinical activities by an examiner.

Study Two warranted consideration of whether it would be a pilot study or a feasibility study. Pilot studies are often deemed as being precursors for larger studies in that they often aim to emulate and trial components and methods of a large-scale study (Arain, Campbell, Cooper, & Lancaster, 2010), but for this study is not a useful analogy. Pilot studies are designed and used where specific objectives are desired such as: recruitment, randomisation, hypothesis testing and outcome measurement; but they may or may not become larger studies (Arain et al., 2010; Thabane et al., 2010).

Feasibility studies on the other hand, should not be confused with pilot studies. A feasibility study has outcomes such as participant willingness, issues of recruitment and sometimes defining an outcome measure; but it stops short at defining hypothesis and is often deemed as having a more flexible methodology (Arain et al., 2010; Arnold et al., 2009; Lancaster, Dodd, & Williamson, 2004; Thabane et al., 2010). Therefore a pilot rather than a feasibility study is warranted to meet the aims and objectives of the study reported.

Furthermore, to increase the reliability of this study, the same questionnaire and assessment methods were used for all students. Closed questions were used (see
appendix 2) and the questionnaire was subjected to a Gunning Fox index test to explore how easy it would be to read (Gunning, 1952). The questionnaire was also piloted on two students from a second year cohort to explore if it was easy to understand and complete. No alterations were required and the Gunning Fox index test showed that it could be understood by an average age range of 12-14 years old.

3.4.4 Quantitative data analysis methods

All quantitative data was analysed using statistical analysis software (SPSS inc., Chicago, IL, USA). There were no losses or missing data. The data was cleaned and checked ensuring it satisfied the assumptions of parametric tests. Three separate parametric tests were then conducted (Ritchie & Lewis, 2005).

The first analysis was measurement of variance (ANOVA) between the groups to explore if there were any significant differences in overall results across the groups. The second was independent t tests to compare specific trends and results when comparing each group. The third was paired samples t tests, which were achieved by having all participants undertake a pre-intervention questionnaire to record baseline cognisance of the two subjects, followed by a post-test questionnaire in order to compare any development of knowledge and/or confidence. The questionnaire was completed by all of the pilot study participants. This was important in exploring the experimental conditions further to include data on ‘softer’ skills such as communication and offers a fuller analysis than that of psychomotor ability or skill alone. The data collected from the questionnaires consisted of multiple
choice and right/wrong answers converted to a rating scale for analysis (Field, 2006), a copy of which is in appendix 2.

Data from the participants was recorded into a codebook to facilitate analysis and included: age, gender, group assigned to, OSCE scores (including: outcome, algorithm use, safety, communication scores, and equipment use), pre- and post-intervention confidence scales and pre- and post-intervention cognitive levels. All data was analysed using statistical analysis software (SPSS Inc., Chicago, IL, USA).

3.4.5 Settings

The qualitative interviews were conducted in a simulation laboratory that was both quiet and comfortable and began with a pre-amble of questions in an attempt to put the participant at ease. The first interview was used as a pilot that checked the interview surroundings and recording equipment for suitability, an important fact to ensure good use of time and material during interviews later on (Pontin, 2002).

The pilot interview was successful in informing and modelling further interviews, with little adaptation of questioning technique or location/resources being required (except for increasing the lighting and positioning respondents away from a main corridor). The data collected from the pilot interview was included in the study and was analysed as part of the findings. The quantitative study took place in HEI classrooms, part-task training laboratories with inanimate manikins such as upper body and head and neck devices and high fidelity simulated environments (ward and operating theatre) between September and December 2010.
3.4.6 Sampling considerations

Sandberg (2000) discusses that an individual’s experience would be ever changing due to the fact that all humans have differing and ever changing life experiences; this would raise the question of how can data from humans be analysed in a way that is accurate and interpretable? Differences in meaning between different individuals experiencing the same phenomena are due to different awareness and prior experience; changes in meaning reflect the changes in content and structure of the individual’s life world, not dissimilar to social learning phenomena of reification (Wenger, 1990). It is these changes that can be viewed as increasing layers of experience (Wenger, 1990).

The sample were a sub-group of professionals (ODPs / Placement educators) with their own social contexts, rules, methods of communication and hierarchy (CODP, 2013). Therefore this sub-group of professionals shared an experiential field of different constituted meanings of a phenomenon when it was presented to them (Watkins, 2000a). Furthermore, the reality of the phenomenon was experienced in a limited number of ways (Marton, 1981a) and can therefore, be categorised into conceptions or themes for analysis. Each individual study (reported in this thesis) contained its own sampling strategy, description and population.

The samples were exploratory in nature in order to offer insight and information intended to answer the research questions posed. Purposive sampling was used and ensured that the participants had the attributes such as knowledge (or lack of knowledge) and relevance required for the separate studies. Purposive sampling refers to sampling that had participants with specific characteristics included and only these participants were approached to take part. Purposive sampling is
depicted by Martyn Denscombe (2014) as being particularly well suited for creating an exploratory sample and when used in this way can emulate a representative sample. For example, Study One required participants with lived experience of studying the traditional9 professional body ODP curriculum. Studies Two, Three and Four required participants with no experience of learning to become an ODP. The final study required participants with lived experience of managing and supporting student ODPs in a clinical environment.

3.5 Ethical considerations for this programme of research

Any research that involves human subjects must have safeguards for their protection (McHaffie, 2000). In particular, using students as research participants can be difficult to manage due to the fact that the researcher has ‘dual agency’ in that they are both researcher and teacher (Ferguson, Myrick, & Yonge, 2006). There has to be a clear and transparent balance between using students as participants, maintaining appropriate ethical considerations and rights of the individual with assurances that withdrawal from the study would not evoke retribution (Bowden et al., 1992).

3.5.1 Main ethical considerations

The main ethical concerns for this programme of research were:

- Using the students as research participants
- Ensuring participants understood their role in this study, were informed and had consented to take part

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9 Traditional curriculum refers to the validated professional curriculum at the University of Portsmouth that did not use simulation-based teaching and assessment techniques.
Ensuring the security of recorded and written data produced from the participants’ interviews

Students as participants are protected by the Declaration of Helsinki (Ferguson et al., 2006). The Nuremberg code refers to individuals who may be captured, vulnerable or dependent (Hultgren, 1989). A student could be classified into each of these areas due to their desire to pass a course: vulnerable to, or dependant on, the educators instructions or requests, or captured in that they are institutionalised within the HEI (Hultgren, 1989; Saljo, 1996). To formally safeguard the participants, ethical approval for this programme of research was sought and provided from the ExPERT Centre, School of Health Sciences and Social Work ethics committee, University of Portsmouth, copies of which can be found in appendix 6.

To answer the specific ethical concerns and maintain the rights and confidentiality of participants several measures were taken. A consent form and information sheet was produced for each of the five studies (appendix 1-5). Each was produced in duplicate and was read and signed by all individual participants and countersigned by the Principal Investigator (PI). Both documents detailed exactly what the study entailed and included instructions on withdrawal for the participants if they so desired. Vitally, confidentiality and anonymity was included on both forms with detailed assurances for each included (McHaffie, 2000); and appropriate ethical approval was sought both from the ODP course gatekeeper (course leader).

The completed consent forms, audio data (.mp3 files), field notes and transcriptions were all treated as confidential material and secured as such. All paper copies of forms and transcripts were kept in a locked container within a locked cabinet; the PI was the only key holder. Electronic files were transmitted to transcription service
providers using servers with SSL encryption and were password protected. In addition, working copies of the data files were stored on a secure hard drive that was firewalled, password protected and locked to a desk.

Participants were unrecognisable in the transcriptions having been allocated a pseudonym and no identifiable data was used in subsequent research papers or presentations. In addition, participants were informed of their ability to withdraw from the study at any time without further prejudice. Withdrawal for this demographic and sample of participants was a realistic possibility due to the participants having extrinsic factors to their lives as already discussed. The participants received verbal withdrawal instructions from the interviewer as well as written instructions on the information and consent form (appendix 1-5) and were supplied a copy for their own records.

3.5.2 Participant validation

Participants were invited to review the transcriptions of their interviews and question the context or interpretation of their transcript against their memory of the interview. This is known as a rigorous process of data analysis (Thompson, 1999), a view also shared by Burnard (1991), who states...” this [review of transcriptions by participants] allows for the validity of the categorising process to be maintained” (p.464). All participants were offered the opportunity to review the transcripts. Three of them reviewed transcripts for Study One, two took part in Study Three, there were no reviews for Study Four and two participants reviewed the transcripts from Study Five. All participants agreed that the transcripts reflected the interview they had undertaken.
3.5.3 Positionality

Positionality refers to the researcher’s relationship with their study being reflexive and open to new ideas, whilst being able to be analytical of their approaches and position and their ability to bracket personal experience and expectations from the study itself (England, 1994). Traditionally, qualitative research and reliability is viewed as a looser science (Daniel & Onweugbuzie, 2002) because the researcher is a conduit, catalyst or interpreter of the data, and as such, refrains from using the term reliability but opts for interpretivist as the paradigm for encompassing reliability. In so doing, these researchers attempt to exclude the possibility of the positivist (and therefore absolute measurable) method of others comparing their work and in so doing being critical of their methods (Daniel & Onweugbuzie, 2002). There were four processes undertaken to mitigate the potential for unreliable representation of the data and therefore a lack of trustworthiness. The four processes followed for each qualitative study were:

1. To remain reflexive and critical of methods used and discuss measures to bracket off pre-conceived ideas. This included using a robust data collection schedule and communicating apriori thoughts to the research team and take criticism and advice seriously.

2. To combine field notes with transcriptions and compare both against the transcriptions of the semi-structured interviews and focus group interviews. This ensured that the data to be analysed was correct and accurate and made the transcriptions more meaningful and real.

3. To analyse the data, following immersion and generate conceptions and themes. Analysis was slow and methodical following the principal of
phenomenography and drawing on the spoken word of participants’ experiences. Clear themes emerged which were checked in stage 4,

4. To triangulate the analysed data with another researcher, disconnected from the study, and to have participant validation to confirm meaning.

Within qualitative research, information that is abstracted from interviews, focus group observation and questionnaires must be trustworthy (Eisenhart & Howe, 1992; Lincoln & Guba, 1995); otherwise themes would not be credible and so not serve to answer the research questions, or fulfil the aim (Merriam et al., 2001). The positionality of the author of this thesis can be viewed as relative to those that are participating in the studies, as Stanley and Wise (1993, p. 157) state:

> Whether we like it or not, researchers remain human beings complete with all the usual assembly of feelings, failings and moods. And all things influence how we feel and understand what is going on.

Consequently, subjectivity can influence research through positions of different backgrounds, cultures, education and lived experiences, or as England (1994, p. 84) puts it ‘…[We] are not part of some universal monolith. We are differently positioned subjects with different biographies.’ Therefore, it is important to be transparent about such a biography and lived experience. To that end it is important to acknowledge such experience.

Therefore, it must be acknowledged that I carry ‘baggage’ of my own through the lived experience of my own education. Subsequently, this has developed throughout my career in academia into evidence-based ideas or ways to improve the learning process (albeit not previously with undergraduate students). Being a registered ODP and an academic could have influenced my approach to this research and in some
ways it did. Having preconceived knowledge of what a ‘good’ practitioner should be and also knowledge of the profession meant that I had to refrain from interfering with participants whilst also remaining true to the data produced.

One way that this was achieved was through frequent research meetings with supervisors and other cross-University researchers. This allowed for open and honest dialogue regarding methodological and analytical approaches, as well as writing skills. That said, the subject of simulation in medical education was not previously known to me in the manner that it was used for this research and therefore bias and subjectivity were not deemed a drawback when analysed reflexively, and this promoted a sense of trustworthiness (Pope & Mays, 2000).

An important part of trustworthiness is credibility and one measure to ensure credibility is triangulation (Ely, Anzul, Friedman, Garner, & Steinmetz, 1991; Glesne & Peshkin, 1992; Miles & Huberman, 1984, 1994). Triangulation was used for the analysed data in each of the studies conducted for this programme of research to ensure that findings were credible and trustworthy.

3.5.4 Triangulation

Bias on the part of the researcher is inevitable to some extent, but it needs to be controlled in order to conduct quality research (Burnard, 1991). Often researchers do not acknowledge the bias that they bring to research and it is often viewed as a negative entity. It could be argued however, that the separation of life from the research is unrealistic and that some subjectivity is warranted to inform and strengthen findings. Mills (1959) argues that:
‘The most admirable scholars within the scholarly community . . . do not split their work from their lives. They seem to take both too seriously to allow such dissociation, and they want to use each for the enrichment of the other.’

(p. 195)

Strauss (1987) concurs with this approach to subjectivity and discusses bias in relation to data collection and analysis further as:

_These experiential data should not be ignored because of the usual canons governing research (which regard personal experience and data as likely to bias the research), for these canons lead to the squashing of valuable experiential data. We say, rather, “mine your experience, there is potential gold there!”_

(p. 11)

However, recognising bias and the experience the researcher brings to the research itself, is not a ‘license’ to uncritically impose one’s assumptions and values (Strauss, 1987). Bias to some extent therefore can be useful if controlled and accepted. The method employed to reduce bias and encourage validity for this programme of research was triangulation. Triangulation is described as the use of multiple methods to converge on an accurate representation of reality (Polit et al., 2001).

The method employed during qualitative data analysis was interviewer triangulation as described by Burnard (1991) as to “invite two colleagues to generate a category system” (p.463). This allowed for categories and themes to be compared by both researchers, and anomalies or differences discussed and decided upon.

Triangulation was undertaken with a colleague who is competent and knowledgeable of qualitative research methodology and principles, and is also a registered ODP who has attained Doctoral level academic study. The triangulation took place individually with edited transcripts, ensuring no identifiers of the participants would be available to any individual other than the researcher and
therefore participant confidentiality. Little change to the categories were required following triangulation other than some wording; this triangulation adds to the validity of the study reducing researcher subjectivity (and therefore bias) in the stages of data analysis such as interpretation of reported conceptions from participants and the resulting themes that these produced.

In the case of this research, the trustworthiness and depth of the semi-structured interviews and focus groups relied on the facilitator, who was an academic member of staff from a different HEI but was not an ODP educator. This mitigated potential for bias or leading the participants whilst conducting the interviews (Lowe, Kerridge, McPhee, & Hart, 2008; Smith, 1999). The same facilitator conducted all of the interviews, guided by interview schedules specific to the cohort or clinical education managers. Bias was mitigated by triangulation of themes between the interview facilitator, the second researcher using field notes and from a third member of the research team. In addition, the focus group facilitator mitigated pre-conception through reflexivity and identification apriori of potential bias in order to assist with bracketing (Ritchie & Lewis, 2005; Strauss & Corbin, 1990; Thompson, 1999).

3.6 Chapter summary

The aim of this chapter was to discuss the overall research methods used for the different studies conducted during this programme of research. This chapter has justified a mixed methods design for this programme of research, as well as rationalising and justifying the use of phenomenography as an appropriate interpretive methodology, for the collection and analysis of data for the qualitative studies. Finally, this chapter has discussed general issues of methodological
approaches for the studies contained in this thesis, issues of triangulation, positionality, transferability and ethics.
Chapter Four

Investigating the traditional curriculum and evaluating simulation-based learning for ODPs
4.1 Introduction

Exploring the effectiveness of ODP learning was crucial to considering the need for any change or curriculum re-design at the University of Portsmouth, by firstly understanding students’ perceptions of learning via a lived experience. Therefore, this Chapter presents two studies, the first of which was the starting point for this programme of research, which explored second year ODP students and the challenges involving learning in the HEI and on clinical placement. Stemming from this is the second study, which is a positivist study, designed to test the effectiveness of three education methods on first year ODP students (n=27) with no experience of the perioperative environment.

4.2 Study One: a study of enablers and barriers to learning in operating department practice

4.2.1 Aim

The first study explores the reported enablers and barriers to learning by ODP second year students with lived experience. The aim of Study One was to answer the first question of this programme of research:

*What are the reported enablers and barriers to learning for Operating Department Practitioner students?*

4.3 Method

4.3.1 Design

Consistent with a qualitative methodology informed by phenomenography and to satisfy the criteria for this study, the sample approach was purposive and was aimed
at all students in the second year cohort. The inclusion criteria for the study was that
the participants should represent the entire cohort and so were male and female
participants, and those with extrinsic time constraint factors such as having children
at home or second jobs (night work for example). This was an attempt to fully cover
the aim and objectives set for this study and ensure as diverse a sample group as
possible, to provide differing perspectives of data (Rankin & Esteves, 1996).

4.3.2 Sample

The sample was convenient and purposive with 15 ODP students eligible to be
included in this study with a total of 12 respondents consenting to take part as table
2 shows. The semi-structured interviews were designed and organised to elicit
responses from the 12 participants who were going to undertake one interview each
(1 pilot + 11 others for a maximum of 45 minutes each). This represented
approximately 80% of the cohort, the semi-structured interview schedule can be
found in appendix 1. The participants began their studies in 2008 and this study was
conducted during their second year of studies (2009).
This study elicited data from a second year cohort of ODP students who had undertaken traditional\textsuperscript{10} teaching and learning for the first year of their course. The approach used semi-structured interviews aimed at obtaining an understanding of the different barriers and enablers of their first year learning from the participant’s perspective. Data was elicited through the use of a qualitative phenomenographic approach, using semi-structured interviews and open questions (see Chapter 3 and appendix 1). The structure of the interviews was designed to explore the participants’ memories, views and thoughts by following an interview schedule. In addition, exploration of the different types of learning between the HEI and on clinical placement was explored to identify from the participants’ perspectives if there were significant differences or inconsistencies.

\textsuperscript{10} Traditional curriculum refers to the validated professional curriculum at the University of Portsmouth that did not use simulation-based teaching and assessment techniques.
4.4 Results

This section presents the findings of the first study, beginning with analysis of the themes and conceptions elicited from the semi-structured interviews. Three themes shall be presented with vignettes from the transcriptions, followed by a discussion relating the findings to the research question and the wider relevant literature.

4.4.1 Structure of themes

The transcriptions were analysed following the six-stage approach as discussed in the preceding chapter and shown in figures 4 (p.94) & 5 (p.96) of this thesis. Data analysis elicited meaningful pools of data (conceptions) that were aggregated into three themes as figure 6 shows, and it is these that provide structure in relation to traditional teaching and learning on the ODP course and the perceived enablers and barriers to learning from the participants’ perspective.

![Diagram](image.png)

Figure 6: Research themes resulting from semi-structured interviews relating to enablers and barriers of learning by second year ODP students
The themes relate to the students’ perceptions, experiences, knowledge and values of learning in placement and the HEI and are therefore grouped into the three distinct areas; simulation and the perceptions of curriculum change, theory-practice gap and learning in placement.

4.4.2 Theme 1: learning in placement

This theme explores the participants’ views and perceptions of undertaking learning on clinical placement. There were some strong beliefs in relation to the participants’ experiences of learning in placement and it is important to try to see these phenomena through their eyes, for example:

[P12-26F] It depends really where you are in placement … you get interrupted. I ask someone to explain something that's just happened and it's oh, alright we'll just get this patient off the table or we'll do it in a minute and then the conversation ends and it never gets followed on.

Participant 12-26F is discussing her perception of learning in a busy placement environment and that at times learning is halted due to the circumstances that her mentor is experiencing, such as having to alter their own expected practice or other unanticipated change to the normal working practice of the team that they are part of. The vignette above has the student at a loss for information and their mentor does not have time to follow up that learning event with sufficient explanation. This participant displays frustration during this response because often, in their view, learning events happened but were not followed up. Another participant has a more personal perspective:
[P4-30M] I don’t think that they are trying to be cruel, well it depends on the mentor. I find that often I say something or ask and just get ignored. At first I thought I was asking at the wrong time … y’know that they were concentrating, but what I did was wait until we were kicking out (emptying theatre after an operating list) and ask then … it still depends on who you ask, some don’t know and some can’t be bothered because they’re rushing to go home …

Emotionally, respondents report that they feel intrusive or that they get in the way of care delivery to the patients. This is a reported barrier to learning and highlights the students’ interpretation of a lack of information from a different perspective to that of the previous vignette:

[P2-28M] Em … [pause] well I work in a big department and I never know until that day who my mentor is or where I am working … lot of the times you feel left out, like you have been slotted in at the last minute, and I end up saying do you mind if I come in here today with you … that’s not right, it’s not organised … and you feel like you’re a burden to them because you know that they’re going to have to slow down, or check your work …

Ensuring that experiential learning is cohesive, sound and fit for purpose is challenging when trying to learn in a busy perioperative environment. The needs of the patient must be the primary focus for all members of the caring team and learning is (or should be) secondary to those needs. P2-28M offers a different perspective in that he sees it as work and not a foremost learning experience. P2-28M states that he feels like he is a burden to the existing theatre team that he has been assigned to and does not have the opportunity to develop relationships with
those teams because he is ‘slotted in daily’. Often in large departments, students are assigned to a theatre once the correct skill mix has been allocated. This is a safety mechanism to ensure that appropriate staff members are in theatre to respond to the needs of the patients undergoing surgery for that specialty. This method of experiential learning is extant in many professions and should not be viewed as always failing. Statistics show that previous cohorts of students have attained the grade required to pass the ODP course and so placement learning must be taking place at the required level and in an effective enough way. One participant was able to sum up their experiences so far:

[P5-38F] At first I would say 98% positive

[Int] Placements?

[P5-38F] Erm … yes, well when I first started I had a mentor that was horrible … I hated going in, did contemplate leaving ….but then I thought he’s not spoiling it for me … after that I went to a new place and although I was dreading it because I thought, if I have another one (poor mentor) but they were great … I absolutely loved it there and learnt tons … but then you have to move again …

[Int] And how was that?

[P5-38F] Well it was to a small department, and it was neurology which I was scared to death about … but I was really well looked after, they took a big interest in my learning and took the time I needed because neuro is very complex … they all went out to help me and that was really good, I learnt tons, I got a lot
The dichotomy of placing students so that they gain the perioperative experiences that they need to attain course success means moving them through different surgical and anaesthetic specialties. P5-38F above discusses the difficulties in the cyclic method of placement learning in that there are variables in the type of department and the type of staff that they will experience. There is a sub-theme of emotion leading to a perceived attitude of placement learning from this participant, where she discusses her feelings of leaving one poor placement and attending another. This has caused a negative reaction to the point of considering leaving the course and is a significant barrier to learning.

Another observation is that P5-38F was completing her allocated time in what she thought was a poor learning experience through stubbornness (He’s not spoiling it for me…) and that tainted her thoughts towards her new placement. The new placement turned out to be much better because of the interest in her by members of staff, to a point where P5-38F reports that her experiences so far were almost wholly positive. Another participant P9-45M feels that placement learning is more down to luck than judgement:

[P9-45M] Yeah, certainly down to where placement is concerned it’s down to luck, you know who you actually get to work with and what you see on that placement … I’ve been lucky so far but I do see those (mentors) that just can’t be bothered, you’re a hindrance to them …

Placement learning for the second year cohort has identified some tensions as revealed by the participants. The perceived lack of cohesive management of their
learning (as they report) and mentor that they were placed with, has diverse effects from making students want to leave the ODP course, to feelings of being in the way, or relying on luck to achieve what they are expected to. Therefore, they share similar feelings and perceived experiences and outcomes, but often for different reasons. This in part provides answers to the barriers of learning in placement for these second year students.

**Key findings relating to this theme are:**

- Suspending learning because of surgical/patient needs
- Mentors not understanding or addressing the needs of students
- Negativity of learners caused by poor placement management

4.4.3 *Theme 2: theory-practice gap: HEI vs placement learning*

Theme 2 relates to participants' perception of the difference between learning the theory in the HEI and the transference of that theory into supporting the learning in placement, the theory-practice gap. It is imperative that all engaged in perioperative care follow the appropriate standards and that there is similarity between all perioperative environments and staff, obviously with the specific needs of the surgical or anaesthetic specialty being facilitated.

*[P3-50M] Sometimes it just isn’t the same, here (HEI) there’s time, and we can stop if we need too … I was in a cat 1 section (emergency caesarean section for foetal or maternal distress) and there wasn’t any time … the doors opened and they just had time to give the sodium citrate before she was gassed down (anaesthetised), I had no time to do any checks …*
[P4-30M] I have to say that sometimes it goes out of the window … you have to do what you’re told because the patient could die … but I keep thinking, what happens if something goes wrong because I haven’t done what I should have?

The participants above were referring to surgical cases where the patient is in physiological distress and there is a real possibility that either the patient or child are in mortal danger. There are sub-themes of fear or trepidation when thinking of what can go wrong; on one hand this demonstrates that the learner is projecting or anticipating a process and realising they are unprepared for such an emergency. The negative side to this is fear or feeling at a loss of what to do if not managed correctly can cause barriers to further learning by experiencing a negative event.

This example is a particularly difficult case to manage as a student because the process of anaesthesia and caesarean section to surgically deliver the neonate happens very quickly with potential for complications such as maternal haemorrhage and often the newborn baby requires resuscitation.

P3-50M identifies that when learning in study blocks, students were used to having time to prepare and to even pause tasks in order to ask questions or confirm procedures. In contrast, he suggests that it is not always possible to do that in clinical placement. This has obviously had an impact relating to him not being able to complete the normal checks that maybe required according to the accepted perioperative guidelines and policies. P4-30M relates to this problem and suggests that sometimes theory and application ‘go out of the window’ because of the nature of the emergency but also discusses the potential for something to go wrong because he hasn’t completed necessary procedures.
Field notes for these participants show that there was observed agitation of the respondents by the PI because they seem to be struggling with a conflict of conscience between what they were taught to do and on the other hand, what the clinical reality indicates. Failure to comply with accepted policies; procedures and guidelines can have very serious consequences for a learner. From these vignettes and field notes, it could be suggested that the participants know what they should do clinically because they have been taught what to do in theory at the HEI, but when that cannot be applied to clinical practice they linger on the failure to comply rather than the reasons for omitting normal procedures. This is an extreme case, but P1-18F suggests that it is not solely the emergencies where there were differences between taught and applied guidelines:

[P1-18F] It is the correct way (HEI learning) but from what I’ve seen now, people don’t really do that … I didn’t have a choice … I wore a mask, scrubbed for five minutes and ensure my sterile field … but then you see these (other staff members) just walk in, no mask, two minute hand wash, gown not done up properly … I think well, ok I’ll do it their way now … but I know back in Uni that would fail …

[P8-30M] And then in practice, or maybe in a different order, but they are similar things, and I’m just trying to find out where your memorisation and understanding take place … which one do I apply … is it more in a lecture? Is it more in practice? Is it both?

Participant P1-18F discusses a learning tension that is apparent throughout the course in that she is trying to rationalise what she knows is the correct way to do something and what is actually happening on her placement. The tensions with non-
resolution of the theory practice gap in terms of guidelines is that the students were being exposed to several different ways of doing or preparing for something as P8-30M articulates, and this leads to confusion and often non-compliance with accepted standards and guidelines. When referring to field notes, participant P11-44M is quite bold in relation to this and sums up theory-practice as:

[P11-44M] It depends … some of it may be helpful (lectures) if you haven’t experienced it in placement, otherwise it’s just retrospective learning

INT Can you explain further?

[P11-44M] Well I’ll learn something in placement and then probably come back here and have a lecture about it … but I’ve already done it … retrospective learning may reinforce what you have been doing, or throw a load of questions up … you think well it’s fine to have a lecture but actually it’s not done anything like that in placement … like I say you have this theory / practice gap where your taught one thing here and you go into placement and it actually doesn’t happen … we should practice here in those situations.

This theme has discussed the participants’ views of theory and practice and combined the two. In terms of the research question, this theme has identified further perceived barriers to learning from the participants. Sometimes theory and standards do not convey appropriately to the clinical learning environment, which can be routine in terms of patient intervention or, on the other hand can be continually changing in relation to a patient’s condition. The respondents infer a disconnection between what is taught in the HEI and the way that their learning is managed in placement.
Key findings of this theme are:

- Learners experiencing fear and trepidation due to the experiences of the patient
- Learners doing what they believe is the right thing to do where the situation or mentor requires them to deviate or comply with a different way of doing things
- Constraints of time / opportunity for learning on placement compared to the HEI

4.4.4 Theme 3: simulation and curriculum change

This theme introduced the idea of curriculum change at the University of Portsmouth to the participants and tapped into the participants’ experience and perception of how this could be managed, and in particular how any changes from their perspective may prove a more positive learning experience.

The respondents were interviewed in one of the ‘new’ simulation areas and they had been acclimatised to the types of equipment available. Participants were guided to discuss what they thought of the facilities:

[P11-44M] I wouldn’t be freaked out by it … I know I’m not going to cause anyone any harm at all and so I reckoned you could relax a little and practice, concentrate on what you need to be doing … here you could probably discuss your actions where in placement you usually can’t …

[P3-50M] I mean yeah definitely, with a real patient I know what I’m capable of and I know what I can and can’t do but I also know what I’m not confident to do,
which I should be by now … somebody said to me, you’ve got the knowledge but no confidence in applying it … I think if this course changed and we used this (simulation) more then I could apply it and that would tie my theory and application together … that would stop me having to do things for the first time on a patient … could you imagine being a patient seeing me and I’m like er, I think this is right … you’d scare them to death.

These participants discuss two significant areas for consideration. The first is P11-44M discussing that he would not be ‘freaked out’ by learning in simulation and conversely, the second is that they can both see the potential for feedback and debriefing on their clinical interventions. This may satisfy the participants’ lack of feedback or questioning at times if they experience this in clinical placement as seen in Theme 1 above.

The participants were projecting themselves into learning in this environment and identify areas where advantage could be gained over their traditional teaching and learning. Participant P3-50M comments that confidence in applying new learning is lacking in that although they ‘know’ theory, they struggle to apply it sometimes. This respondent refers to the interview area (by a sweep of their hands) and infers that learning here (in simulation) could ‘tie’ together the two aspects of ODP learning (HEI & placement) that would, in their opinion, enhance their confidence. This participant then refers to that learning, to the patient in their care, by reflecting what they perceive it is like for a patient with a student who is not confident. This participant’s mentor also states to them that he ‘is’ confident but in theory alone. Whilst discussing changes to curricula and what the participants perceive might be appropriate changes, the potential to learn in simulation was a prevailing topic:
[P7-24M] Because I think that it would make you feel more confident when you go into practice … and you can clear up any issues that you didn’t quite get in lectures … as opposed to letting them build up and then sort of four months later still not having achieved them in practice … just think it would be better to do more in the beginning.

[P10-30F] We have all said that we thought we would have liked it (simulation) and I think as a group the cohort have all suggested that they would have liked time in there … I think new first years should have more time, it would boost their confidence a bit … you could definitely pick up the principles.

[INT] What principles?

[P10-30F] Well things like setting up theatre, checking equipment and patients in….learning how to read patient notes and respond to the patient as well as understanding what the anaesthetist is talking about…..

[P6-52F] I think it would be great to practice what you would do without worrying or causing any sort of issues or problems, where in theatre … er … in clinical placement, it’s totally different, you have to be 100% confident in what you are doing.

These participants make several reflective observations that were echoed throughout the data set. Instilling confidence through the use of simulated learning prior to clinical placement is mentioned with the respondents articulating two specific areas of confidence. P7-24M discusses a lack of confidence that is carried into clinical placement because the opportunity to ‘clear up’ inconsistencies of practice between the HEI and placement or misunderstanding of application of theory had
not occurred for him. This caused confusion that he says lasts for four months. P10-30F suggests that the cohort consensus is a need to have more simulated learning at the start of the course for two reasons; the first is that it would increase confidence prior to clinical placement and the second is the observation that they would ‘pick up’ principles such as non-verbal communication skills and anaesthetic technique.

When prompted to expand on this point, she states that several principles could be instilled through simulation (basic equipment skills, communication etc.). The areas that she discusses were usually experienced quite early on in placement but interestingly she discusses an understanding of what an anaesthetist may need when performing anaesthesia on a patient. It is interesting that confidence and understanding are spoken of when these participants have only been orientated to the simulation department and have not actually undertaken any learning within it. The participants were imposing their experiences of learning and reflecting on where different learning methods could be used in a new curriculum at the University of Portsmouth:

[P1-18F] I think that we need more practical, maybe something else could be moved at the start of the course because we go out and the mentors like, well you've been in Uni for ages, lets see what you know … I didn’t know anything really … I understood the parameters that I was seeing on the screen but couldn't relate them to the patient in front of me … then I was thinking well this makes no sense at all … then the patient was off the table and it was question time … I felt stupid …
[P10-30F] I spent 10 minutes earlier with [lecturer] and he was showing us … going over things and I thought wow, that makes sense … and I’ve been in placement for a year! [laughs] … If that was a year ago and you could see things being one properly, like have the lecture and then put it into practice that would have been fantastic …

These participants highlight areas of learning and expectations from mentors who think that students should ‘know’ more because they have spent four weeks in university. This results in P1-18F being questioned on what she has been taught and because she is unable to link physiological measurements to the questions being asked she is left feeling ‘stupid’. P10-30F expresses the point that she has spent a very short time in the simulated environment and refers to that kind of learning to ‘making sense’. She exudes enthusiasm in the potential for simulated learning at the beginning of her studies and other respondents echo this conception:

[P12-26F] You may think that this is stupid but even if we spent some time going through … like this is the BP cuff and this is the sats probe and this is where they go, you would be more aware when you go in (placement) … and you’ve talked about it in the classroom and I get the lectures but applying it is different.

[INT] Why is that?

[P12-26F] Well when you first go in its all new, I haven’t been in theatres before and it’s a weird place, obviously they don’t like you touching a patient at first or even the (anaesthetic) machines … they go … well if you can wipe down the leads and clean that up … and that’s all very well but it doesn’t take long … having said that I was terrified of cleaning the anaesthetic
machine, I thought what if I mess it up and change all of the settings by accidentally touching a button, so I didn’t do it, but then I got told off for not cleaning it … I didn’t want to say why.

[INT] Why?

[P12-26F] Well I would have felt even more stupid … oh, sorry I didn’t clean it but I’m scared [laughs] … if we were taught those things in here, I appreciate that they’re lots of us and there are only so many weeks before we leave to go to placement but there’s a lot to cram in … and then your off [laughs] and into the real world …

This participant relates to simulation as being a potentially useful tool in learning psychomotor components of perioperative working. She discusses the challenge of acquiring theoretical knowledge but applying it for real is ‘different’ and that learning in simulation may alleviate such feelings by facilitating repetitive deliberate practice. P12-26F identifies a barrier to her own learning by being frightened to touch a piece of machinery because she felt that she may ‘mess it up’. When that feeling was investigated further, she felt that her lack of knowledge was compounded by feelings of stupidity because the machine frightened her.

Key findings of this theme are:

- Identification of the challenges of learning in simulation
- Perceived advantages of simulation-based learning such as rehearsal
- Development of confidence via repeated practice
4.5 Discussion

4.5.1 Main findings of Study One

Study One aimed to answer the first research question:

*What are the reported enablers and barriers to learning for Operating Department Practice students?*

This study comprised an analysis of the perceptions of learning from 12 second year ODP students, informed by a phenomenographic approach and individual semi-structured interviews. The data provided a rich source of information relating to the enablers and barriers of learning to become an ODP and therefore answered the first research question in the following ways:

Firstly, the participants agreed on several challenges to the phenomena of learning, including perceived tensions between what is taught in the HEI, and how learning is managed on clinical placement. They also report inequality in opportunities of learning on clinical placement and often that they had to learn two ways of doing the same thing; the first to satisfy the needs of passing assessments at the HEI and the second to comply with their clinical ‘master’ and be accepted into the clinical environment. Poignant quotations that illustrate this include P4-30M: *What happens if something goes wrong because I haven’t done what I should have* (what has been taught in the HEI) … and P3-50M: *Sometimes it just isn’t the same, here* (HEI).

In addition, the participants’ articulate issues of the support needed on placement learning and the perceived disadvantages of learning through apprenticeship methods by following a mentor. This is congruous with previous research and discussed in the literature (Fell & Kuit, 2003; Hamshire et al., 2012) and included
treatment of the student by the clinical educator such as, P4-30M stating: *I don’t think that they are trying to be cruel. I find that often I say something or ask and just get ignored.*

The difficulties and challenges of inequity and reliance on placement learning and apprenticeship discussed by participants and reported in the literature have been a major theme from this study. There have been representative examples of comparison between the participants understanding their learning and reflecting the actions of some previous qualified practitioners. Vignettes such as “*It might be a case of double standards … don’t forget they’ll be signing you off …*” were testimony to these participants identifying shortfalls in observed practice and recognising limitations to placement learning through apprenticeship.

Participants report that there were often tensions between what they have been taught in theory by the HEI and what they experience within their clinical placement. There is evidence from the participants’ narratives that learning experiences in different anaesthetic and surgical specialities were unequal between different learners, with both positive and negative experiences varying from one placement to the other.

Theme 2 takes the inequity of placement learning further as respondents reflect on the differences between learning in the HEI and learning on placement. In particular the very nature of learning in a perioperative environment is guided by research informed policies, standards and guidelines. Moosavi et al. (2013) infer that learning in a clinical environment involves the learner and teacher engaging on a journey of partnership. Often respondents have identified that there were differences applied in
clinical practice and that mutual partnership inferred by Moosavi et al. (2013) is not apparent.

This challenges the concept of promoting a team approach discussed by Timmons and Tanner (2004). The respondents discuss that often their experiential learning and observations of the ‘norm’ within placement were the ‘correct’ method in which to perform. This potentially causes a two-tier method of learning, one for the HEI and one for the clinical placement. This theme also conveys that HEI learning is simply a method of confirming taught theory and practice on placement. In particular P11-44M discusses that placement learning is retrospectively confirmed by lectures during study blocks.

Finally, the participants reflected on their first year learning experiences and place that learning into context of curriculum change as seen in Theme 3. Without exception, the respondents challenge certain aspects of learning in placement, particularly actions such as using complex machinery or taking a patient’s physiological measurements that cause them distress, upset or embarrassment. This mirrors the findings from a study by Hart and Rotem (1994) that learners in clinical environments require autonomy, role clarification and a safe environment (amongst other things). The participants of this study indicate that these aspects that were not always suitably organised and that learning in simulation prior to clinical placement would enhance and support teamwork and the issues of practising on patients and disparity of clinical learning opportunities as discussed by Sandrioni (1997).

The findings from this study point to a number of historical shortcomings when students were relying on placement learning and that there is a disconnection, either
real or perceived, between learning in the HEI and learning whilst on placement. The participants discussed simulation as a method of learning specific tasks or as having the potential to raise confidence by undertaking simulated scenario or case based learning. Furthermore, there is a potential risk to the patient’s physical or mental welfare where the learner is practising a skill or technique. Maintaining the physical, psychological and psychosocial care of the patient can be challenging because care of the patient becomes secondary to learning (Lowe et al., 2008; Reynolds & Kong, 2011).

However, future studies would need to answer the question of affordances of learning when comparing different educational methods, seeking to explore whether ODP learning in simulation is a suitable adjunct to the existing methods, and an effective pre-junct to clinical learning in placement.
4.6 Study Two: a positivist study investigating the effectiveness of three teaching methods: traditional teaching and learning, part-task training and simulation-based learning

4.6.1 Introduction

Study Two is informed by the data collected in the previous study, such as participants highlighting challenges in placement learning due to unequal exposure to learning opportunities, learning being different between the HEI and clinical placement and perceptions of simulation-based learning providing advantages that other methods of learning do not. This motivated the development of a quantitative study that investigates three teaching methods or ways of learning. The purpose of Study Two was to triangulate and validate the findings in Study One and to further develop an understanding of ODP education. In addition Study Two sought to explore for this group of ODP students whether or not simulated learning was more effective than other methods and if so why and in what aspects? (skill, knowledge, both).

4.6.2 Aim

This study aimed to investigate and compare the effectiveness of constructing knowledge, skills and ability using three types of learning:

1. Traditional teaching and learning.
2. Part-task training.

Each group were taught and assessed on two clinical activities, Rapid Sequence Induction (RSI) and Immediate Life Support (ILS) in order to answer the second research question that informs this programme of research:
What are the key parameters that determine whether or not the teaching method used leads to improved skills and knowledge acquisition?

4.6.3 Null hypothesis

Participants who were allocated to the simulated learning group shall not outperform part-task training and traditional teaching and learning groups in both assessed OSCEs and in post-test knowledge scores.

4.7 Method

4.7.1 Design

This pilot study adopted a prospective, simple randomised design. Randomisation provides each participant with an equal chance of being allocated to one of the three intervention groups (1:1:1). There were no changes to the design of this pilot study during execution.

4.7.2 Participants

A group of 30 second year ODP students met the inclusion criteria and were approached to take part in this study. Of these, 27 students agreed to participate and informed written consent was provided by all participants (Ferguson et al., 2006; Horner, 1999; McHaffie, 2000). A copy of this can be found in appendix 2.

Specific ethical issues of concern for this study were that participants would be randomised into different groups and be taught two specific subjects using one of three methods of teaching. Therefore some participants may not have performed as well as others and this may have potentially had a negative effect on their self-efficacy. Assurances were made that, following the study, all participants and non-
participants would have the two intervention subjects re-taught to them all at the same time and to the same standard, thereby mitigating any gaps in knowledge or ability and therefore addressing this ethical issue.

4.7.3 Study settings

Table 4 shows the pilot study timeline including traditional teaching and learning, interspersed with a two-week block when the data collection for this pilot study was undertaken. The final six weeks of academic teaching were allocated to ensure that all students had received the same standard of teaching, a condition of the University of Portsmouth curriculum-writing group and an ethical intervention. Non-participants (n=3) of this study were given the opportunity to undertake self-directed learning during the two week timetabled pilot study.

Table 4: Revised academic structure timetable

<table>
<thead>
<tr>
<th>Content</th>
<th>Wk 1</th>
<th>Wk 2</th>
<th>Wk 3</th>
<th>Wk 4</th>
<th>Wk 5</th>
<th>Wk 6</th>
<th>Wk 7</th>
<th>Wk 8</th>
<th>Wk 9</th>
<th>Wk 10</th>
<th>Wk 11</th>
<th>Wk 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional teaching and learning</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Pilot study group intervention</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Consolidation of learning</td>
<td></td>
<td></td>
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</tbody>
</table>
4.7.4 Interventions

The interventions were used to identify whether or not the teaching method used on two assessed activities affected the knowledge and skills learned by the participants. Issues relating to the second year student themes reported in Study One above, such as practical knowledge and confidence, were measured through dependent t tests to identify if the revised academic structure could address limitations of a traditional teaching and learning curriculum. The three types of learning were:

1. **Traditional learning (TTL)** where a student receives subject specific lectures as is the historical teaching method for these undergraduate students at this stage of their learning. For this group this was the only teaching arranged as they were representatives of the non-intervention group or ‘control’ group and would normally rely on clinical placement activity to develop further knowledge and skill.

2. **Traditional learning augmented with part-task training (PTT)** that facilitates practice using an inanimate object such as a cannulation arm, an upper airway torso or a resuscitation manikin. The PTT group had two additional classroom-based workshops that allowed practice of the theoretical principles for assisting in an RSI and ILS lasting three hours each. These workshops used upper torso part-task trainers to practice RSI and the addition of a practice automated external defibrillator [AED] for ILS.

3. **Traditional learning supported with simulation (Sim)** in a contextually similar environment, using hi fidelity manikins and ‘staff’ who involve the learner in a scenario. Each participant would be evaluated to identify if there
were any differences in attained knowledge, skills and abilities in two topics: rapid sequence induction of anaesthesia [RSI] and immediate life support [ILS]. The Simulation group attended two three-hour workshops where simulated scenarios of a patient requiring an RSI or resuscitation using an AED ran repeatedly, utilising a contextual learning environment (simulated operating theatre), an anaesthetic machine and a lecturer (imitating an anaesthetist), operating table and hi fidelity manikin METI-HPS™ that responded to drugs, oxygen delivery and defibrillation. This attempted to create an environment where clinical interventions were applied in response to the patients’ (manikin) changing physiology as shown in figure 7 below.

Figure 7: The teaching interventions by randomised group-simulation, part-task training & traditional teaching and learning
4.7.5 Outcomes

The primary outcome was to analyse participants’ knowledge, skill and algorithmic ability in the two assessed activities subjects RSI & ILS. Participants undertook formative assessment using an Objective Structured Clinical Examination (OSCE) format, by an external examiner using a standardised checklist (appendix 2), which scored knowledge and skill for each participant. Assessment outcomes were scored using safe/unsafe criteria and were ratified by an independent, experienced clinician who was blind to the participants’ intervention group.

The secondary outcome refers to the pre-test/post-test knowledge scores to compare the participants’ baseline knowledge compared to knowledge gained through their learning experiences based on the group they were randomised into.

Questionnaires that respondents will complete themselves are deemed an efficient method of data collection (Robson, 1994) and if the questionnaire is well designed are actually easy to code and analyse; likewise the measurement of objective assessment of knowledge and skill in action. The choice of questionnaire used for this pilot study contained closed questions. To measure the students’ ability in clinical simulated scenarios, an OSCE was developed (appendix 2) and examined by an external registered and competent practitioner.

To elicit the pre-post test data, a questionnaire (appendix 2) was offered to all consented members of the pilot study sample. The questions were designed to provide useful data in terms of what the students’ theoretical knowledge and perception of given clinical scenarios and confidence levels in participating in such scenarios were. The questionnaires were given to the students along with an envelope for completed questionnaires to be left in. They were then collected at the
end of the study day, thereby negating the problem of the students feeling obliged or pressurised into completing the questionnaire. All participants completed the questionnaire.

The questionnaire was designed to compare existing knowledge of the study participants in two different subjects: algorithmic procedural tasks for rapid sequence induction of anaesthesia and indications for automated external defibrillation. These subjects would normally be taught in the second year of their programme of learning. First year students have limited knowledge of these subjects and so it was important when comparing teaching methods in simulation, part-task training and traditional teaching and learning, that data was collected to identify cognitive, psychomotor and affective abilities from the participants’ perspective.

4.7.6 Sample size

Recruitment was based on a single, convenience sample of a generic population of undergraduate ODPs, with 27 participants consenting to take part and three declining. The participants were first year undergraduate ODP students who had no clinical learning experience. For previous cohorts of ODPs, teaching and exposure to the two test subjects (RSI & ILS) would have traditionally taken place late in the first-year curriculum. This data was collected at the very beginning of the participants’ course of study; as such there were no exclusion criteria set due to participants having no taught experience of the two test subjects or having experienced any clinical learning when this study was conducted.
4.7.7 Randomisation

Randomisation followed a proportionate allocation strategy (Procter & Allan, 2009) due to the small numbers of participants and to ensure an appropriate balance of participants in each arm of the study. Participants selected a number between 1-27 previously written on a piece of paper from a container. A member of the research team then received the paper from the participant and placed the number into one of two containers to equally distribute those participants with previous clinical experience and those without. This facilitated those participants with previous clinical experience to be allocated across the intervention groups, mitigating any potential for skewed results. For example if all participants with some previous experience were allocated to TTL and happened to have some osmotic experience of the two assessed subjects from their previous experiences.

Finally each of the two containers was systematically emptied into one of three containers. This allocated the student into either a traditional teaching and learning group [TTL], a part-task training group [PTT] or a simulation group [Sim] (Procter & Allan, 2009).

4.8 Results

4.8.1 Participant flow

Figure 8 below shows the flow of participants through this study, including enrolment, allocation, follow up and analysis. There were no losses or exclusions after randomisation, with equal participant numbers in each group.
Figure 8: The pilot study research design, based upon CONSORT template by Schulz, Altman, and Moher (2010)
4.8.2 Recruitment

The age of the participants ranged from 18 years to 51 years with an average age of 33 years. The distribution shows a bimodal peak at age ranges 30 and 40. This is similar to previous cohorts of ODP students at this University and is representative of a normal recruitment to the course. This sample was normally distributed in terms of gender and at the very beginning of their first year of study as figures 9 and 10 show.

![Age Distribution Chart]

Figure 9: Age distribution of the participant sample showing a range between 18 and 51 years of age with a bimodal peak of 30 and 40 years of age
Figure 10: Gender distribution of the participant sample showing 14 female participants and 13 male participants

The gender of the sample is evenly matched between males and females, and representative of previous cohorts. In addition, the sample group means that an equal number of participants were allocated to each of the three groups.

4.8.3 One way analysis of variance (ANOVA)

In order to gather detail from the data, the data from the three groups (independent variables) were analysed to identify any interaction or relationship between groups. The first level of analysis sought to look for the need for further statistical investigations and was required to explore if there were any statistically significant differences between the means across the groups in terms of psychomotor/skill
performance when undertaking post-intervention OSCEs for the subjects of RSI and ILS.

The one-way analysis test of variance that table 5 shows, is that there was a significant difference across the groups for the RSI OSCE results with a CI of 95% \[ F(2, 24) = 0.778, p = 0.041 \]. The ILS OSCE results showed a variation of \[ F (2, 24) = 0.704, p=0.054 \].

Table 5: One way analysis of variance across the three sample groups showing a significant variance across groups for the RSI assessment and a borderline result for the ILS assessment

<table>
<thead>
<tr>
<th>OSCE Result</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RSI</td>
<td>Between Groups (Combined)</td>
<td>1.556</td>
<td>2</td>
<td>.778</td>
<td>3.652</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>5.111</td>
<td>24</td>
<td>.213</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>6.667</td>
<td>26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ILS</td>
<td>Between Groups (Combined)</td>
<td>1.407</td>
<td>2</td>
<td>.704</td>
<td>3.304</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>5.111</td>
<td>24</td>
<td>.213</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>6.519</td>
<td>26</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
This shows a borderline non-significant variance for the ILS OSCE assessment between the groups, as table 6 illustrates. The borderline RSI result ($p=0.054$) warranted further analysis and so a Welch $F$ Test was used to clarify significance between groups. A Welch $F$ test is a method of statistically analysing the equality of means by adjusting the $df$ for small population samples (Field, 2013). The adjusted results for small sample numbers are reported as being significant between groups for the RSI OSCE result $F(2, 15.249)= 4.5$, $p=0.027$ and the ILS OSCE result $F(2, 15.249)= 4.00$, $p=0.040$.

Table 6: Results of the Welch $F$ test showing the statistics allowing for the small population samples and adjusted significance levels for the RSI and ILS assessment results across the groups

<table>
<thead>
<tr>
<th>Statistic</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSCE Result RSI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Welch</td>
<td>4.594</td>
<td>2</td>
<td>15.249</td>
</tr>
<tr>
<td>Brown-Forsythe</td>
<td>3.652</td>
<td>2</td>
<td>21.482</td>
</tr>
<tr>
<td>OSCE Result ILS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Welch</td>
<td>4.006</td>
<td>2</td>
<td>15.249</td>
</tr>
<tr>
<td>Brown-Forsythe</td>
<td>3.304</td>
<td>2</td>
<td>21.482</td>
</tr>
</tbody>
</table>

a. Asymptotically $F$ distributed.
4.8.4 *Independent t tests*

Having explored that a group’s difference in means, chance effect and probability are significant, the next stage is to test the results of individual groups in relation to their group OSCE results. This can only be achieved by analysing individual group data (Field, 2006; Field, 2013). Figures 11 and 12 show the overall results for the two assessments.

![Graph showing pass/fail headcount of the entire sample regardless of allocated group](image)

**Figure 11**: RSI OSCE result showing the overall pass/fail headcount of the entire sample regardless of allocated group
Figure 12: ILS OSCE result showing the overall pass/fail headcount of the entire sample regardless of allocated group

The independent t tests show a variation between the groups; comparisons between the simulation group and the part-task training group for the RSI OSCE show that the simulation group results are statistically significant (M=1.11, SD = 0.33) than that of the PTT group (M=1.55, SD = 0.52; conditions t(16) = 2.1, p=0.048, illustrated by table 7. Similar results are found when comparing the RSI OSCE results between the simulation group (M=1.11, SD = 0.33) and traditional teaching group (M=1.66, SD = 0.50; conditions (16) = 2.77, p=0.014 as table 8 shows. The PTT group (M=1.55, SD = 0.52) and the TTL group (M=1.66, SD = 0.50) results in the RSI OSCE do not show significant differences in performance (p=0.65).
Table 7: Independent t tests comparing the Sim & PTT group results in both assessment activities

<table>
<thead>
<tr>
<th></th>
<th>Levene's Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
</tr>
<tr>
<td>OSCE Result RSI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>11.184</td>
<td>.004</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSCE Result ILS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>11.184</td>
<td>.004</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
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</table>
Table 8: Independent t tests comparing the Sim & TTL group results in both assessment activities

<table>
<thead>
<tr>
<th></th>
<th>Independent Samples Test</th>
<th></th>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Levene’s Test for</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Equality of Variances</td>
<td></td>
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<tr>
<td></td>
<td><strong>F</strong></td>
<td><strong>Sig.</strong></td>
<td><strong>t</strong></td>
<td><strong>df</strong></td>
<td><strong>Sig. (2-tailed)</strong></td>
</tr>
<tr>
<td>OSCE Result RSI</td>
<td>Equal variances assumed</td>
<td>5.776</td>
<td>.029</td>
<td>2.77</td>
<td>.014</td>
</tr>
<tr>
<td></td>
<td>Equal variances not</td>
<td>5.776</td>
<td>.029</td>
<td>2.77</td>
<td>.014</td>
</tr>
<tr>
<td></td>
<td>assumed</td>
<td>4</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSCE Result ILS</td>
<td>Equal variances assumed</td>
<td>5.776</td>
<td>.029</td>
<td>2.77</td>
<td>.014</td>
</tr>
<tr>
<td></td>
<td>Equal variances not</td>
<td>5.776</td>
<td>.029</td>
<td>2.77</td>
<td>.014</td>
</tr>
<tr>
<td></td>
<td>assumed</td>
<td>4</td>
<td>4</td>
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</table>

However, table 9 overleaf shows the results of the ILS OSCE reporting a greater difference between these groups. Comparison between the simulation group and the other two groups in the ILS OSCE show that the Sim group had better assessment outcomes.
(M=1.11, SD = 0.33) than the PTT group, (M=1.44, SD = 0.52) conditions t(16) = 1.60 and the traditional teaching group (M= 1.66, SD = 0.50; conditions t(16) = 2.77 p=0.014. Comparisons between the PTT group (M= 1.44, ± 0.52) and the TTL (M=1.66, SD = 0.50) conditions t(16) = 0.91, p=0.37.

Table 9: Independent t tests comparing the PTT & TTL group results in both assessment activities

<table>
<thead>
<tr>
<th>Independent Samples Test</th>
<th>Levene's Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>t</td>
</tr>
<tr>
<td>OSCE Result RSI</td>
<td>.703</td>
<td>.414</td>
<td>-.459</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSCE Result ILS</td>
<td>.703</td>
<td>.414</td>
<td>-.918</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
4.8.5 Dependent t tests

Finally, it was important to explore if there were any differences in cognitive knowledge and self-assessed confidence of the participants. The paired pre-, post-, knowledge tests showed that there was a significant change in the Sim group’s scores ($M=10.00$, $SD = 3.16; p=<0.001$) and in overall confidence ($M=-2.22$, $SD = 0.44; p=<0.001$). There was a lesser, but still significant effect in the PTT group, pre-post test, ($M=-3.77$, $SD =1.30; p=<0.001$) with confidence reported as ($M=-1.44$, $SD = 0.52; p=<0.001$). The TTL group with no experimental manipulation demonstrated pre-post test results of $M=-0.22$, $±SD = 0.66; p=0.34$, and for confidence, results of $M=-0.33$, $SD = 0.50; p=0.08$.

The final analysis of the paired samples $t$ test was conducted to identify the probability of a chance happening of the results. The means reflect the results as shown in table 10 (paired samples statistics) for each condition as well as the standard deviation and the standard error and these reflect the dependent $t$ test scores.
Table 10: Pre-post-test means for each of the groups in terms of cognition and confidence scores. The confidence scores are self-assessments whilst the cognition scores are marks accrued from a subject knowledge test.

<table>
<thead>
<tr>
<th>Group</th>
<th>Pair 1</th>
<th>Pre-Test</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sim</td>
<td></td>
<td></td>
<td>10.1111</td>
<td>9</td>
<td>1.53659</td>
<td>.51220</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post-Test</td>
<td>20.1111</td>
<td>9</td>
<td>4.10623</td>
<td>1.36874</td>
</tr>
<tr>
<td></td>
<td>Pair 2</td>
<td></td>
<td>1.3333</td>
<td>9</td>
<td>.50000</td>
<td>.16667</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post teaching self confidence score</td>
<td>3.5556</td>
<td>9</td>
<td>.52705</td>
<td>.17568</td>
</tr>
<tr>
<td>PTT</td>
<td></td>
<td></td>
<td>10.0000</td>
<td>9</td>
<td>1.73205</td>
<td>.57735</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post-Test</td>
<td>13.7778</td>
<td>9</td>
<td>1.64148</td>
<td>.54716</td>
</tr>
<tr>
<td></td>
<td>Pair 2</td>
<td></td>
<td>1.4444</td>
<td>9</td>
<td>.52705</td>
<td>.17568</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post teaching self confidence score</td>
<td>2.8889</td>
<td>9</td>
<td>.60093</td>
<td>.20031</td>
</tr>
<tr>
<td>TTL</td>
<td></td>
<td></td>
<td>10.2222</td>
<td>9</td>
<td>2.22361</td>
<td>.74120</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post-Test</td>
<td>10.4444</td>
<td>9</td>
<td>1.94365</td>
<td>.64788</td>
</tr>
<tr>
<td></td>
<td>Pair 2</td>
<td></td>
<td>1.1111</td>
<td>9</td>
<td>.33333</td>
<td>.11111</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post teaching self confidence score</td>
<td>1.4444</td>
<td>9</td>
<td>.52705</td>
<td>.17568</td>
</tr>
</tbody>
</table>

Further analysis presented in table 11 below shows these correlations in more detail and displays the relationship for each group. Analysis of the correlation coefficients identifies that the Sim group has a significant correlation ($p=0.025$) and a large correlation coefficient ($r=0.731$) in the pre-test and post-test conditions; however, the condition of self-perceived confidence of the participants’ prior to and after experimental manipulation is slightly different in that there is still a large correlation coefficient ($r=0.632$), but the significance is less than the cognitive score ($p=0.068$).

---

$^{11}$ Dependent $t$ tests analysed using SPSS uses Pearson’s equation for correlation between two conditions (pre & post test).
Table 11: Pre-test, post-test correlation coefficients between the Sim, PTT and TTL groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Correlation</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sim</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pair 1</td>
<td>Pre-Test &amp; Post-Test</td>
<td>9</td>
</tr>
<tr>
<td>Pair 2</td>
<td>Pre teaching self confidence score &amp; Post teaching self confidence score</td>
<td>9</td>
</tr>
<tr>
<td>PTT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pair 1</td>
<td>Pre-Test &amp; Post-Test</td>
<td>9</td>
</tr>
<tr>
<td>Pair 2</td>
<td>Pre teaching self confidence score &amp; Post teaching self confidence score</td>
<td>9</td>
</tr>
<tr>
<td>TTL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pair 1</td>
<td>Pre-Test &amp; Post-Test</td>
<td>9</td>
</tr>
<tr>
<td>Pair 2</td>
<td>Pre teaching self confidence score &amp; Post teaching self confidence score</td>
<td>9</td>
</tr>
</tbody>
</table>

The PTT group show similar results to the Sim group in the cognitive condition ($r=0.703$) and a significant correlation ($p=0.034$); however the confidence scores are not quite as high as simulation showing a medium effect ($r=0.570$) and a similar correlation ($p=0.109$).

Finally, the TTL group show the greatest correlation coefficient for cognition ($r=0.958$) with a very high level of significance ($p=<0.001$). In participants’ self reported confidence the TTL group show a correlation coefficient that is of low effect ($r=0.395$) and similar correlation ($p=0.292$).
4.9 Discussion

4.9.1 Main findings of Study Two

The study reported here was designed and executed as a positivist study to answer research question two:

*What are the key parameters that determine whether or not the teaching method used leads to improved skills and knowledge acquisition?*

A quantitative approach that compared traditional learning, part-task training and simulation-based learning was conducted on a first year cohort of ODP students. Exploring what the differences were in the effectiveness between teaching methods, as well as the relationship of an ODP sample compared to the wider literature of other professions such as surgeons, anaesthetists, paramedics and nursing groups, was required to answer the research question.

Following simple randomisation and intervention, the participants were taught and assessed on two clinical activities using an Objective Structured Clinical Examination[^12] [OSCE] format. The results show that the simulation group outperformed the other two groups in clinical skills and the application of new knowledge in caring for simulated patients and communicating with qualified staff. These results show that the method of teaching had a positive effect on learning for these study participants in the following ways.

Firstly, ANOVA analysis revealed that the Sim and PTT experimental groups had an incremental increase in both correlation coefficients between the pre- and post-test data and the levels of significance. The TTL group who had no further experimental

[^12]: An OSCE is a method of assessing or examining a student’s knowledge and ability using a standardised checklist.
conditions imposed following the pre-test data collection other than routine lectures highly correlate pre and post conditions for both cognition and confidence, staying almost the same. This illustrates the development of cognition and confidence of the ODP participants taught in simulation that is not observed in other studies, demonstrating a greater learning experience than skill acquisition alone.

Secondly, the dependent $t$ tests explored the experimental conditions further to include data on ‘softer’ skills such as communication and offer a fuller analysis than psychomotor or practical ability alone. The results refer to the group’s confidence in performance. For both the Sim and PTT groups the results indicated that there was some improvement in the participants’ self-assessment of confidence and cognitive ability. The TTL group had little change in confidence reporting, indicating that the participants in this group had the same level of confidence and cognition both pre and post intervention.

Therefore, if these results are replicable, they indicate that formally introducing simulation-based learning for ODPs could address the shortfalls and inequity of traditional student learning that was evident in Study One.

Integrating simulation-based learning for this ODP professional group combined with traditional teaching and learning methods prior to clinical placement addressed issues of equality of learning and attaining similar experience by the participants and was more effective than traditional teaching methods. This has the potential to mitigate the challenges of the EWTD, apprenticeship learning on patients and restrictions of placement availability (Department of Health, 2011a, 2011b).
4.9.2 Limitations

This was the first study of its kind for ODPs, which informed the creation and implementation of a revised academic curriculum at the University of Portsmouth that used simulation-based learning activities in a more formal and managed way. This included teaching subjects such as communication, teamwork, clinical skills and terminology to students prior to their first clinical placement. Whilst the results presented are encouraging, limitations include single site, small numbers of participants and convenience samples. Therefore, the results should be accepted in light of such limitations.

However, the results demonstrate successful recruitment, group allocation, teaching strategy, use of an external examiner and an OSCE format for assessment and administration of the pre-post test questionnaires in an ethically conducted pilot study. In addition this pilot served to validate the teaching and assessment tools such as equipment use.

4.10 Developing a revised academic curriculum for ODP students at the University of Portsmouth

The findings of Studies One and Two provide a basis and rationale for revising the traditional ODP curriculum integrating simulation-based learning at the University of Portsmouth. Maran and Glavin (2003) identify the need for preparing professional students such as ODPs prior to clinical placements as being paramount in order to make the most of decreasing clinical placements and experience available therein, and “maximise further learning opportunities.” (p.22), they propose there is a need for something in order to “plug the gap”, thereby addressing any shortfall between
placement and apprenticeship styles of teaching and “real” patient exposure. Based upon the themes presented in Study One from the second year student cohort regarding their learning experiences, future students may potentially benefit from a revised academic structure.

To develop, manage and action this, a curriculum-writing group was founded at the University of Portsmouth and consisted of academics, quality advisors, professional advisors and clinical teaching managers. There were no current students included in the curriculum-writing group, however, professional advisors included recently qualified ODPs from the geographical area having previously studied the traditional, non-simulation based ODP curriculum. The rationale for not including students in the curriculum-writing group was that current students undertaking the revised simulation-based curriculum were asked to evaluate their learning experiences. Excluding current students enabled them to be independent and uncontaminated by not being involved in the curriculum-writing group processes.

However, it is acknowledged that this could be a weakness and future studies of this kind could seek inclusion of students from previous cohorts of students or students from similar professional areas.

The terms of reference for this group were to embrace, interpret and act upon the themes from the second year student data. It was desirable that this would identify ways in which the students’ recommendations could be implemented, whilst still adhering to the validated academic programme, ensuring that no subject shortfall occurred throughout the pilot of the revised curriculum. The curriculum-writing group agreed on two changes to the current academic structure for teaching ODPs:
Firstly, the initial clinical placement that was previously scheduled following four weeks of theoretical teaching in the HEI was removed. The rationale for this was to increase the theoretical and practical application of theory for this cohort within the HEI using simulation-based learning. This revised curriculum at the University of Portsmouth would employ traditional teaching and learning techniques, part-task training techniques and the introduction of simulated learning for a cohort with no prior experience of the course.

The second recommendation was that a coherent evaluation of the findings of the pilot be undertaken and measured against contemporaneous literature of other professional groups reported in the literature. The implementation of the revised ODP curriculum was scheduled for the 2011 first year cohort of students who would then continue on the revised academic structure for the duration of their course.

4.10.1 Conceptual framework adopted for ODP curriculum change

A conceptual framework is the collection of ideas, theories, assumptions and knowledge base for a given subject area (Strauss, 1987) and is crucial in providing a foundation or basis for change (Strauss & Corbin, 1990). Miles and Huberman (1994) define a conceptual framework as:

*a visual or written product, one that “explains, either graphically or in narrative form, the main things to be studied - the key factors, concepts, or variables - and the presumed relationships among them”*  
(p. 18)

For this programme of research, the use of a nursing conceptual framework is intended to organise ideas, support and inform, how to change the curriculum for ODPs at the University of Portsmouth. The conceptual framework for the changes made to the curriculum were based upon the Jeffries (2005) simulation model as
This framework is developed from the theoretical and empirical literature related to simulation in nursing, and identifies several aspects of simulation design (Ironside et al., 2009). The essential aspects of simulation identified by Jeffries (2005) include:

- Teacher factors
- Student factors
- Educational practices that,
- Influence the design of specific simulation experiences and therefore,
- Student outcomes

Furthermore, the Jeffries framework is designed to provide context for teaching and learning in simulation. It provides a structure that may be manipulated depending upon the student type, stage and profession (Ironside et al., 2009). Jeffries (2005) argues that successful learning requires proper design of a simulated learning experience and careful organisation of the learners undertaking the simulation. Based on this premise, several changes to the extant ODP curriculum and programme management were required.
Figure 13: Jeffries conceptual framework for simulated learning in nursing
4.11 Changes made to the traditional ODP curriculum

Based upon the Jeffries (2005) conceptual framework and to test it for the education of ODP students, several changes were made to the traditional\textsuperscript{13} curriculum at the University of Portsmouth, including:

- Development of a revised timetable to incorporate simulation and part-task training that augmented the traditional curriculum
- Mapping the extant learning outcomes of units of study to the revised timetable of the ODP course
- Communication of changes to clinical education managers via the clinical liaison group meetings
- Completing University of Portsmouth major change documentation in regard to unit handbooks requiring validation through University quality mechanisms
- Development of formative assessments relating to unit learning outcomes
- Increase student support mechanisms such as tutorials (practical and theoretical) to facilitate the development of student's in learning difficulty
- Unit co-ordinator development to ensure that separate units of study over the first 12 weeks were complimentary and specific to learning outcomes
- Re-writing of unit handbooks to reflect the changes in learning, teaching and assessment strategies

These changes took place between January and August 2011 and whilst the overall curriculum or programme outcomes were not changed, the changes made to the

\textsuperscript{13} Traditional curriculum refers to the validated professional curriculum at the University of Portsmouth that did not use simulation-based teaching and assessment techniques.
learning, teaching, assessment and student support strategies required validating internally by University quality mechanisms.

The addition of simulated learning and part-task training activities were absorbed into the additional study time by removing the first clinical placement for these students. This meant that there was no compression of teaching new or extra activities into a short study block. In fact, the revised curriculum at the University of Portsmouth allowed more time for theoretical lectures that were then supported by practical application in either simulation-based or part-task training laboratories. Specific subjects enhanced by the revised curriculum, through the addition of simulation or part-task training activities included:

- Equipment and patient safety checks
- Communication techniques with anaesthetists, surgeons and other perioperative team members
- Aseptic techniques
- Approaches to patient assessment
- Assistance with routine general anaesthesia
- Approaches to basic airway management
- Monitoring and basic clinical interventions on patients recovering from anaesthesia

These subjects naturally lend themselves to teaching and learning practically and would normally be introduced to the students on clinical placement. The additional learning time afforded by removing the initial clinical block meant that students would undertake traditional lectures in these subjects, but then undertake small
group activities either in a simulated environment, or practising specific clinical
techniques such as airway management in part-task training facilities.

4.11.1 Implementing a revised curriculum for ODP students

The rationale for the development and implementation of a revised curriculum at the
University of Portsmouth was to attempt to address the limitations of other methods
of teaching and learning. Anticipated benefits including addressing the limitations of
educational theories, and in so doing go some way in addressing the reported
difficulties and constraints that students and the NHS experience.

4.11.2 Addressing the limitations of behaviourist learning

Learning through the use of behaviourist techniques has three distinct limitations for
ODP students, these were:

- Limited time in experiential unequal clinical placements
- Experiential learning through trial and error
- Stimulus-response in relation to communication

By implementing the revised curriculum the students would be able to spend an
equal amount of time learning in specific clinical scenarios. The scenarios would be
replicated exactly for each group and therefore offer the same learning experience
for all.

Students were encouraged to make mistakes and so learn through trial and error
(behaviourist) methods, whilst receiving constant and consistent feedback on their
interventions by the lecturer controlling the learning session. This facilitated students
becoming involved in clinical interventions and being able to question actions in real
time without the incidence of time pressure or potential injury to a patient that may occur in clinical placement. Finally, students were encouraged to practice using terminology, verbal and non-verbal communication techniques and the use of complicated language such as names of surgical interventions (choledochojejunostomy for example), whilst in a simulated theatre environment using realistic perioperative documentation and clinical scenarios.

4.11.3 Addressing the limitations of cognitivist learning

Educators who rely on learning using cognitivist theory will experience two limitations:

- Construction of reality through individual representations of a phenomenon
- Altered meaning of a phenomenon through reliance on clinical exposure

Where students have relied on learning in clinical placement as the method of practical application of theory, they have often done so as an individual in clinical placement. This leads to the students often making sense of a learning event or phenomenon by using their own internal constructs such as their knowledge, belief, interpretation and social background. This can develop an altered understanding of an event and therefore altered meaning. For example, two students learning anaesthetic techniques on clinical placement may be exposed to a similar demographic of patients (older adults for example) but create different interpretations of their learning experience. Simulation has the reported benefit of being able to create such a scenario but also engage a group of students through the learning experience whilst highlighting specific important learning points that
could be missed. It is hoped that this learning then translates and enhances learning within the clinical placement.

4.11.4 Addressing the limitations of constructivist learning

Simulated learning that augments traditional techniques may be able to mitigate the limitations of learning through constructivism. There were two main areas for consideration:

- Error consequence
- Development of more complex learning

Error consequence is a term that refers to conducting an action that results in error, for example potential harm to a patient, and then being able to learn from that error. Consequential learning is similar to trial and error, and often results in a negative learning experience. Simulated learning can be designed to replicate errors resulting in consequences for the ‘patient’. For example, learning communication techniques can be made realistic if the manikin responds to questions from the student or displays altered physiology based on a learner’s interventions. This results in realistic outcomes to care interventions, which can be easily re-enforced through positive debriefing by teaching staff.

This has two advantages; firstly, there is no harm that befalls a patient through the learning experience and secondly, the learning experience itself becomes a positive rather than negative one. Finally, complex learning can reportedly be achieved through simulated learning by employing either individual or social learning techniques of hierarchy. Groups of students can be taught in simulation and develop
their individual knowledge and teamwork in scenarios designed to engage groups or teams.

For example, a simulated cardiac arrest can engage students in different roles and develop their knowledge of the responsibilities required of those roles. These learning events usually rely on long-term experiential learning under ideal conditions. As previously discussed, these conditions are not always available in the clinical environment due to the nature of patient care, and the requirement for making concise, rapid and appropriate care decisions.

4.11.5 Addressing the limitations of apprenticeship learning

The limitations of learning through professional apprenticeship such as following and learning from a master and hoping that the master is at the forefront of knowledge is significant in the clinical learning for ODP students. Limitations such as trying to socialise into a complex learning environment can result in delivering care based upon the master’s knowledge, which may not be contemporary.

Learning through the revised curriculum aimed to mitigate these problems by encouraging students into social learning groups, developing and constructing knowledge by learning together. It was anticipated that this would address the difficulties of trying to become socially accepted in a perioperative environment, by already having gained social and professional skills using simulation-based learning in the HEI. In addition, the ‘master’ in simulated learning is the academic lecturer and therefore should certainly be at the forefront of knowledge in terms of professional and regulatory aspects, clinical interventions, methods of anaesthesia and surgery, resuscitation and critical care. This should mean that the students
learn from an appropriate teacher in the HEI and therefore have experience of correct techniques and methods prior to engaging in clinical learning.

Furthermore, if simulation is employed in the ODP curriculum, and evaluated successfully, it could address the time constraints of learning whilst complying with the EWTD (Department of Health, 2009) by having scheduled simulated learning blocks that support placement activities. High impact learning of stressful situations that were uncommon in clinical practice such as malignant hyperpyrexia or unanticipated difficult airway management can be constructed in simulation. This may help to address the concerns and tensions of relying on potentially vulnerable patients in order to practice and learn on, or waiting for a learning opportunity to present itself (Department of Health, 2011a; Hudson, 2000; Kohn, Corrigan, & Donaldson, 2000; Lave, 1996; van der Vleuten, 1996), at a time when learning should be secondary to treating the patient.

4.12 Chapter summary

This chapter offers the first in-depth insights into the teaching and learning for ODP students with a unique group of participants (Study One). The participants were second year students who had successfully completed their first year studies and clinical placements, but who had relied on traditional teaching and learning methods at the point that the data was collected.

In addition, the positivist study (Study Two) presented in this chapter sought to explore the effectiveness between three education methods of this sample population. It addresses several important issues, specifically in areas of teaching,
learning and assessment such as part-task training, simulated learning and traditional teaching and learning.

The results satisfied the main research questions described at the beginning of the chapter by investigating students’ thoughts and perceptions of barriers to learning and evaluating three methods of teaching ODP students. The findings add to the existing literature through the addition of an ODP sample. In addition, the results from the first two studies presented in this thesis serve to illuminate, triangulate and offset each other by using a mixed methods approach.

The results from Studies One and Two have set the scene for a curriculum change and development in ODP education. The use of a conceptual framework to inform changes to the curriculum at the University of Portsmouth has offered a basis to further investigate ways in which to develop simulation-based learning for ODP students. This has laid the foundation for further research exploring the question of whether simulation is a feasible pedagogy to develop higher order learning.
Chapter Five

Perceptions and attitudes of students and clinical educators in relation to the implementation of the revised ODP curriculum at the University of Portsmouth
5.1 Introduction to this chapter

5.1.1 Aim of this chapter

The aim of this chapter is to discuss the findings of three studies investigating the perceptions and attitudes of student ODPs and clinical educators in relation to the implementation of a revised curriculum that integrates simulation-based learning into the ODP curriculum at the University of Portsmouth.

The research question that the three studies presented in this chapter addresses is:

*What are the key parameters that determine whether or not simulation-based teaching encourages higher order learning?*

To answer this research question three studies were conducted (studies Three, Four and Five). Study Three was a series of focus group interviews that investigated the different perspectives of implementing simulation into the learning for student ODPs prior to their first clinical placement.

Study Four follows up the same participants six months into their ODP course and explores further their perceptions and experiences of learning in the HEI and on clinical placement.

Study Five aimed to explore the perceptions of the revised curriculum at the University of Portsmouth from the view of clinical training managers. Focus group interviews were used to investigate the experience of teaching and assessing this first year cohort in the clinical environment as figure 14 overleaf shows.
Figure 14: The research design for the final three studies presented in Chapter Five
5.2 Study Three: a study of first year ODP students’ attitudes and perceptions of learning through a revised curriculum

5.2.1 Introduction

This study investigates the perceptions of participants undertaking the revised ODP curriculum at the University of Portsmouth that integrates simulation-based learning. The cohort of ODP students who started in 2011 studied the revised curriculum that followed a 12-week academic timetable, followed by two weeks leave and then their initial clinical placement. During this new 12-week study block the students were engaged in traditional teaching and learning methods including lectures, seminars, tutorials and part-task clinical training. In addition they were also introduced to two organised simulated clinical environments (one operating theatre and one ward/post anaesthetic recovery area) with learning outcomes that were constructively aligned for learning simulated clinical skills (Biggs, 1999) and based on the Jeffries (2005) nursing conceptual framework.

5.2.2 Aim

The primary aim for this study was to investigate and describe the first year ODP students’ experiences and perceptions of having undertaken a 12-week revised curriculum that integrated simulation-based learning, prior to beginning placement learning.
5.3 Method

5.3.1 Design

Revising the ODP academic curriculum meant the students began with a period of acclimatisation to the simulated learning environments. The equipment and manikins were demonstrated to the students in an attempt to develop their knowledge, ability and skills in the following subject areas:

- Infection control (hand washing/dressing appropriately to suit the environment)
- Communication skills (with each other and the patients)
- Clinical abilities, through taking observations, monitoring patients’ physiology and identifying untoward or adverse patient responses to interventions

This simulated learning was carefully mapped against the (previous) traditional teaching and learning methods in an attempt to accelerate the students’ cognitive, psychomotor and affective ability in specific perioperative learning events including:

- Assisting an anaesthetist to safely perform all required pre-anaesthetic safety checks
- Assisting and conducting a general anaesthetic
- Safely preparing a surgical environment for simulated surgery using an aseptic technique
- Monitoring and intervening safely to the physiological representations of a simulated patient during the recovery phase post-operatively
This was achieved by learning in a simulation-based environment, using high fidelity manikins and members of the education team purporting to be ‘staff’ who involve the learner in a scenario. Simulation attempted to create an environment where clinical interventions were adapted in response to the patients’ (manikin) changing physiology (constructivist learning) and allowed learners repeated (behaviourist learning) practice with error consequence\(^{14}\). Aspects of learning such as inappropriate airway management techniques resulting in the simulated patient becoming hypoxic, requiring further interventions by the student (cognitivist learning) or engaging in communication with surgical staff to develop non-verbal communication skills and use of technically appropriate language, were adopted (social learning).

\(5.3.2 \text{ Sample}\)

One entire cohort of first year ODP students at the beginning of their academic studies (n=30) were approached to take part in this study. Towards the end of the 12-week study block, the students were consented and assigned to one of five focus groups for data collection of reflections, learning points and thoughts of their learning in the HEI to date. The sampling strategy aimed to reflect the diversity of age and gender in the ODP student population, was purposive in nature and convenient offering the opportunity to collect data that would be a direct comparison between the previous and new curriculum methods as table 12 shows (Procter & Allan, 2009; Ritchie & Lewis, 2005).

\(^{14}\) Error consequence refers to ‘allowing’ adverse events to happen to the manikin if the correct action is not performed.
Table 12: Participant demographics for Studies Three and Study: ODP students undertaking the revised curriculum

<table>
<thead>
<tr>
<th>Focus Group</th>
<th>Gender</th>
<th>Age</th>
<th>Previous experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>47</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>35</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>29</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>29</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>38</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>41</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>37</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>24</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>28</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>40</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>24</td>
<td>No</td>
</tr>
<tr>
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<td>F</td>
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5.3.3 Data collection

A total of five focus group interviews were conducted with first year ODP students, 11 weeks into their course. The participants were allocated groups amongst their peers, consisting of five focus groups of six participants each (n=30) using a simple randomisation frame. The focus group facilitator and the second researcher reported that saturation of data was achieved during the final interviews of the cohort, as there were no new responses, ideas or thoughts verbalised by the participants.

5.4 Results

The characteristics of the cohort were compared similarly in ages (ranging from 18-51 years old) and gender (18 female and 12 male) to previous cohorts and had no formal experience of the ODP course, however some participants had worked as unqualified staff in clinical roles.

Data was collected to the point whereby saturation was achieved and triangulated by members of the research team. Only students who had not undertaken clinical placement learning could offer the lived experience between learning using simulation in the new curriculum at the University of Portsmouth and previous education strategies already researched, which was an optimum consideration for answering the final question for this programme of research (Pope & Mays, 2000; Smith, 1999).
5.4.1 Structure of themes

The transcriptions from the FGIs elicited meaningful units that were separated into 10 ‘pools of data’, and it is these that provide structure to the themes in relation to learning using simulation techniques as a pre-junct to clinical placement learning. The themes fall into three significant categories as figure 15 shows, and sit within individual, moral dualist and pedagogic domains.

The second theme introduces the individual to the notion of professionalism, but drives that further from the individual to a collective moral dualist approach [good and bad or right and wrong]. To that end, can professionalism be developed from one participant into a team approach and if so what were the consequences therein of the application of competent, caring simulated patient intervention?

Beginning with the participants’ self-perception, the data is concerned with the individual and what was happening whilst being exposed to the phenomena of simulated learning. The final theme of this study relates directly to the origins of learning within a simulated environment and addresses the how, why and what in terms of the learning phenomena.

The quotations from the transcriptions below were verbatim and from across the focus groups. Participant classification is square bracketed and relates to the participant’s gender, age, FGI number and previous clinical experience for example: [F37-FG1 NPE] = female age 37 from focus group one, with no previous clinical experience; [M21-FG5 PE] = male age 21 from focus group five, with previous clinical experience.
5.4.2 Theme 1: self perception of learning via the revised curriculum

This theme investigates the concept of higher order learning and the relationship between learning using simulation and the perceptions of the participants in relation to self-belief, efficacy, confidence, application of knowledge and retention of new clinical constructs. There were some perceptions that demonstrated what simulated learning meant to this first year cohort, for example:
[F37-FG2 PE] I thought I knew what I was doing before this [course] and I did it well but then I got here and don't have a clue what they're saying ...

[M24-FG4 PE] I thought that ... I'd seen people do this course that I thought well, they're not that good, if I get better at my job then it should make it easier.

The statements above were from two participants who had previous experience of working within an operating theatre in an unqualified role, who share the assumption that they were clear what was expected in order to be successful on the ODP course and how that could be achieved. These exemplify having to unlearn previous methods of working. Field notes show that participant F37-FG2 PE demonstrated physical exasperation and annoyance at not knowing, whilst M24-FG4 PE had a pre-conceived notion that the course would be an extension of their current role and therefore one would benefit the other. The facilitator developed the confidence or lack of confidence idea, specifically relating to past experiences of some focus group members and how their learning to date made them feel:

[M47-FG1 NPE] Because you feel like your achieving … the whole thing is a team and it's an achievement that makes me confident in doing a good job.

[M33-FG5 PE] ... yeah, that’s good and I know some trained staff that can’t do that, but we can already, I go home and think wow and it makes me want to do more …

The participants discuss achievements of learning and the impact that it has upon their confidence and motivation and they share a sense of learning. M33-FG5 PE is basing his understanding of achievement on previous experience by comparing his learning to date and what he has observed in practice prior to beginning the ODP
course. Conversely, M47-FG1 NPE has no previous perioperative experience to measure his learning against, but still senses achievement through learning, particularly in team events working and learning with peers. The team events that he discusses were undertaken in a simulated environment designed to develop communication skills. In addition, F33-FG3 PE discusses that practice (simulated) develops confidence:

[F33-FG3 PE] you’ve had a little practice and been taught the slides [PowerPoint™], then you get that bit of confidence rather than feeling ‘I bet they [theatre workers] think I’m a right idiot’ it’s all about confidence, that’s what makes me do it right.

This respondent discusses that they feel that confidence makes them do things correctly. This participant links the notion of confidence and competence with taught theory, linking to the theory-practice theme discussed earlier:

[F24-FG2 NPE] I’ve already learnt that here, the proper way and that makes me feel really good, I can’t wait to go out and show them how its done - you’ve got a little voomph [sic] you know ...

[M51-FG3 NPE] … not learning anything, because it all mushes in my brain into one thing … when you’re actually standing there and you come to do it … it does make sense and you know what you’re doing and you think, well I am learning something and I am moving forward.

[F38-FG5 NPE] learning like this [revised curriculum] … it bridges the gap between theory and practice I think …
[F31-FG4 PE] it [simulation] bridges the gap between uni and what we do in hospital.

These vignettes explicitly discuss the phenomena of applying theory taught in the HEI into practice and displays the connection between what the participants had been taught in simulated activities and practiced in the HEI and the perceived role that they would perform clinically. In addition, there is a moment where F31-FG4 PE pre-empts that their learning will transfer cognitively, that is to say that a mental construction or memory has been created using simulated learning that they believe will directly transfer to their clinical ability on placement.

Six weeks into their 12-week study block of using simulation to augment traditional teaching and learning methods, the participants watched a short film that saw the adult simulation manikin be anaesthetised for proposed surgery. The anaesthetic itself was uneventful but within a few minutes, the simulated patient’s physiological representations on the monitor began to deteriorate (simulated anaphylaxis). The participants were able to watch the physiological changes in real time, two-dimensionally on a screen in the classroom and then on another screen there was a wide angle shot of the simulated operating theatre, manikin and staff member (simulating an anaesthetist). The purpose of such a film is to visually reinforce the process of administering a general anaesthetic to a patient in real time, whilst allowing the individual to cognitively follow the process of a safe anaesthetic and the interventions therein of the anaesthetist. This should result in a period of anticipation where the participants will adapt their actions based upon the patient’s needs and the physiological state that they observe; this in turn should facilitate a level of cognitive anticipation of the next psychomotor action to be performed in order to safely anaesthetise the patient for surgery.
Normally, this type of teaching is reserved for qualified registered practitioners who have much more experiential learning and autonomous clinical experience to compare and contrast good practice with bad practice. For these first year ODP participants, the film was shown to identify if the previous six weeks of learning would cause such anticipation, and if so, to what extent. Put another way, how did the students perceive this (usually advanced) clinical event and would any participants identify how they would have acted had they been participating in that emergency?

[M28-FG2 NPE] ... And it was realistic. You felt like it was actually happening. It was just really sticking and your sort of 'huh' ...

[F35-FG1 NPE] ... like you said - it was a visual representation and you saw people who were actually teaching you in that situation, I thought I had gone to a cinema to watch something, it seemed that sort of feeling but I felt I had the opposite effect, I found it very thought provoking because it made me think more about what I would do in that situation.

[M29-FG1 PE] You were sort of thinking 'I’m not going to remember that' but then as they went through it and injected the adrenaline you thought 'yeah, that’s when you do that and this’ and it makes much more sense.

The data above infers that the participants were able to follow what was happening by processing the information on the video that they saw. For this type of learning to become memory and then transfer or be retained, the participants would need to both follow the evolving situation on film and be able to anticipate what to do next.
[F47-FG5 PE] We did feel like we wanted to get up and go in there ... just to see if there was anything we could do ... I mean how often do you get to see a cardiac arrest or an anaphylaxis ...

[F27-FG3 PE] Yeah I was ready to jump up and get in there because I wanted to get involved ... I could see what was happening and knew the adrenaline would take two minutes [to work] ...

Participant F47-FG5 PE is describing a physical response to the emotion evoked by following the film, which is shared by participant F27-FG3 PE during a different focus group. In addition, the scenario on the film and the description they gave of the frequency of such events are synonymous with reality. That is to say that they refer in the same way to both the simulated phenomena and their perception of the ‘real life’ phenomena occurring. Participant F27-FG3 PE also had a motor response to the film but demonstrates anticipation by verbalising how long the drug would take to work, indicating that they were appropriately following the emergency treatment of the ‘patient’.

The aforementioned vignettes suggest different interpretations of learning and of confidence. The participants converge on a comparison between theory and practice, and that simulated learning events help to bridge that gap. In addition, the participants articulate the phenomena of projecting themselves into a simulated situation that they were observing. Given that it is such an early stage of their course and some participants have never been into a perioperative environment, they share relationships and understanding of these phenomena. This is demonstrated where participants discussed the application of concepts of
perioperative theory and simulated practice that they have been taught into the scenario that they were observing and their cognitive and physiological responses.

**Key findings of this theme are:**

- Participants identifying and challenging knowledge preconceptions
- Applying new knowledge into clinical practice by ODP learners
- Cognitive processing of observed actions and evaluating the appropriateness
- Closing the theory-practice gap

### 5.4.3 Theme 2: aptitude: behaving as an ODP

Imparting professional behaviour and communication are aspects of the ODP curriculum instilled through traditional lectures at the beginning of the course following the published standards of the statutory body (HCPC). Students are traditionally taught the theoretical components that they should aspire to, such as the standards of conduct, performance and ethics from the statutory body and the student codes of conduct from the professional body (College of Operating Department Practitioners, 2003; HCPC, 2003). Whilst undertaking their first study block, students would be taught about the importance of acceptance by placement staff by ensuring that they have ‘understood’ how they must act in a professional manner. That is not to just know the standards required but also to be able to perform to those standards.

Therefore, the traditional apprenticeship model of learning ensures that the student copies the mentor in order to cope and learn. Specific aspects of professional
behaviour usually learned from the mentor include appearance; dressing to suit particular environments; speech and communication; and learning of terminology; thus enabling the student to ‘talk the talk’ in a professional way, hopefully commensurate with ability or known limitations.

The assessment of professionalism is embedded into the competence assessment document that would be completed by the student’s clinical mentor or training manager progressively throughout the duration of the course. The students in this study did not go into a clinical placement at the usual point in the curriculum but instead undertook explicit simulated learning and assessment of knowledge, professionalism and competence. The results from the objective assessment identify that the students achieved a satisfactory standard of competence, which raises the question of whether this type of learning progresses their ability and if so, why from the students perspective did that happen?

[M40-FG2 NPE] And you know it’s alright team working. That’s what you are going to do in theatre, you’re all working as part of a team, that’s what happens in here [simulation] and then when we go out [onto placement] we’re all going to be doing our little bit and it’ll all come together.

[F25-FG5 NPE] I think if you keep us in the team we have we would be fine for a simple [operative] case, we all know how to decipher the list and get ready.

[F29-FG1 NPE] Well, handover a patient to different sections properly, or receive them ... From reception into the anaesthetic room, then theatre or back into recovery and from there to the ward - and I think we can do all of those things already because of working together in here [simulation]
Teamwork is a consistent theme and learning with peers is highlighted as a positive learning event in the simulated environment. Participant F29-FG1 NPE discusses that they were going to be able to clinically perform because of the practice and simulation scenarios through the HEI facilities.

[M28-FG3 NPE] Simulation … it’s comparison of a good situation and a bad situation. To be able to highlight the point, and say to people in a team where there was very poor communication and what happens, why that is important, why you need to tell people. It reinforces that and allows me to practice that.

Participant M28-FG3 NPE has no prior experience of working in a perioperative environment but discusses an important aspect of learning how to communicate. How the participant is able to understand the importance of communication is through simulation, but in addition the respondent is debating the importance of good communication by all team members.

[M26-FG5 NPE] I wanted to ask, what if we do things the way that we have been taught here but they say we’re wrong? Should we say for example that we have been taught it to the HCPC standards here [HEI] and that we have researched the correct way of doing particular things?

[F32-FG4 PE] It might be a case of double standards … don’t forget they’ll be signing you off, if you tell them that they are wrong they won’t like it.

[M24-FG2 NPE] If there is confusion or double standards, you’ve got the time to ask the questions here [HEI] in scrubs or not … but I guess where a patient is
involved it won’t always be appropriate at that time, the thing is to trust what we know and everything is always backed up with evidence.

These participants discuss the problem of placement / HEI inconsistency where a mentor would do something different in practice from what the student has been taught in the HEI. Therein lies a challenge which participant F32-FG4 PE identifies and raises the question of whether or not the student should capitulate or conform to the ways of the mentor in order to be signed off as clinically competent. In response participant M24-FG2 NPE discusses trust from the HEI and that what is taught is evidence-based and correct.

These vignettes indicate that the participants were developing a sense of professional morality (right, wrong-good, bad) within this focus group because the participant trusts what they have been taught in order to rely on it later in clinical practice. Therefore, the participant will stay good to what they know and will not let bad practice threaten that; this has been achieved through teaching 'in scrubs’ which would indicate the effectiveness of simulated learning in this instance.

It is examples of learning, such as those quoted above, that infer learning through the revised curriculum at the University of Portsmouth, and using simulation, encourages higher order learning and learning that would be achieved on clinical placement. This goes some way to answering the final research question and the aim for this programme of research.

[F38-FG1 NPE] the thing is I know how to react ... watching the PowerPoint is fine but how will that work? Particularly with the language thing and masks on ...
... I watched you [all] in the scenarios and I watched [lecturer] and I get it,
I know how to act, I see the difference then it’s my turn and it’s almost a reaction, just like the film [anaphylaxis] … I can’t wait to get out there …

Participant F38-FG1 NPE refers to the translation from observation into practice whilst identifying differences between the lecturer and peers as a method of understanding what to do. In essence, this participant is evaluating ‘good and bad’ and deciding on their own actions prior to commencing them. In addition, watching the anaphylaxis film and reacting to it has ignited a sense of excitement prior to their placement.

**Key findings from this theme are:**

- Developing team working skills amongst their peers
- Developing communicative abilities that they can later apply clinically
- Perceptions of addressing inequity of learning and placement inconsistency
- Development of understanding of their clinical role and required abilities

5.4.4 Theme 3: Learning in the University

It is important to try to understand the students’ perception of learning that they have undertaken so far on their course. In any cohort of students from diverse backgrounds and lived experiences there shall always be challenges in any approach to teaching in terms of addressing the curriculum needs and the individual needs of the students.

A 12-week study block within the HEI with the addition of simulated learning techniques was anticipated to address the shortfalls of any one traditional teaching method and learning theory. Furthermore, the revised curriculum at the University of
Portsmouth was designed to engage the students professionally and academically whilst also nurturing perceived ‘softer skills’ such as communication and professional approaches to care. Twelve weeks of study however is a very long time to spend engaged in learning activity, and so it was important to understand the participants’ views on this long initial block of study.

[M28-FG2-NPE] you seem to hit the ground running and don’t stop, I can’t believe we’re about to go out.

[F40-FG3 PE] It’s gone so fast because of what we have done, it’s better than having a piece of paper saying how it’s done.

These vignettes describe the students’ perception of time and that time has passed so quickly. Participant F40-FG3 PE refers to the simulated learning and identifies that it is better than a piece of paper. Field notes describe that the focus group is very busy at this time discussing the pros and cons of how they have been taught and there is an air of excitement from the participants.

[F43-FG5 NPE] I never knew what to expect, I’ve never been to University but I can tell you this … in my 43 years I have never felt so well prepared. [the education team] have been fantastic and seemed to read where I didn’t understand … going from the classroom into the ward to apply the theory is excellent and makes me learn, I don’t think I’m behind on anything but feel really happy to show what I can do …

[M26-FG5 NPE] I’ve learnt tons, your right it’s the constant changing of learning way … I thought it would be boring but I have gone home every day knowing more … but tired …
it keeps you on your toes doesn’t it? I’ve been to Uni before but never been taught like this ... at home I can’t stop running through things and working them out in my head ...

These participants report that they feel prepared for clinical placement by their experience of the study block but also discuss they have learnt what they feel is a lot of knowledge. The repeated comparison to the simulated learning approach [simulated ward] represents engagement by the participants. There is reference to the learning process not being boring and so in terms of engaging the participants’ interest, simulation holds value in the participants’ view. Comparison of previous learning to simulated learning during this study block relates to participant engagement in the HEI and when the participant is away from the HEI.

Simulation is great and it made you want to learn more and want to do more.

... learn things but in a relaxed situation and repeat them when you need to.

And we’d learn from each other then, which we need to do. We’re not spending our time together but still learning all of these things in simulation.

Yeah it’s good to help each other out ...The difference between different lessons is obvious but really important ... when we were watching the simulation and then doing it a couple of weeks later you could see the algorithm working ... everybody was focused, everybody was learning, in my mind. But then when we had that week of lectures
The participants discuss the learning method as being great and relaxing and in comparison to traditional methods of lectures that they see as being boring. There is also reference to engagement and learning through the techniques of film and simulation and this focuses their mind. Often students will refer to lectures as being boring and unfortunately that is quite often true. These participants make no reference to the lectures that were undertaken as part of the revised curriculum and it is important to highlight this. The 12-week study block consisted of 40% of lectures, yet the participants do not separate out the activities of simulated learning to any extent; instead refer positively that they move from one type of lesson to another.

The discussion for Study Three is combined with Study Four, however Key findings of this theme are:

- Participants’ verbalised perceptions of the advantages of engaging in simulation-based learning such as it being interesting and engaging compared to other methods
- Participants felt more prepared for placement learning
5.5 Study Four: investigating the perceptions of learning, by first year ODP students six months into the revised curriculum

5.5.1 Introduction

Study Four follows up the participants from Study Three above, after six months of HEI / placement learning. The participants had, since the last FGIs, followed the structure of the revised curriculum as detailed in figure 16 overleaf.

5.5.2 Aim

The aim of this study is to investigate the relationship between learning in simulation via the revised curriculum at the University of Portsmouth, and how that relates (if it does) to higher order learning after the initial clinical placement.

5.6 Method

5.6.1 Design

The design used for this follow-up study remained unchanged from the methods described for Study Three above, FGIs with participants remaining in their original group allocation, with interviews guided by a schedule, a copy of which is in appendix 4. Participants were guided to reflect on their learning experiences in the HEI as well as learning on clinical placement. Clinical placement involves allocation of a learning environment in anaesthetics, recovery or scrub rotations and allocation of a clinical educator or registered practitioner who should ascertain learning needs and then manage the process of learning with the student.
5.6.2 Sample

There were no losses over the six-month period and all 30 participants from Study Three consented to take part in this follow-up study. Information sheets were re-issued to all participants and contained up-to-date information on the purpose of the study. The process of data collection (FGIs) and that the participants could decide to withdraw at any time during the study was drawn to their attention. The participants were reminded of the focus group that they were previously allocated to and a timetable set to undertake each FGI during an allocated study day in the final week of their study block. The same interviewer who managed the FGIs for Study Three also conducted the follow up FGIs reported here.
5.6.3 Data collection

The FGIs were designed to explore participants’ memories, views and thoughts regarding their preparedness for clinical placement, now that they had experienced it. Amongst the questions being asked were: given how you felt at the end of the study block when the last FGI was conducted, do you feel that the long study block prepared you for learning on clinical placement? If so, how, why? and what examples can be recalled? In addition, an exploration of the different methods of learning between the HEI and clinical placement was undertaken to identify from the participant’s perspectives if there were significant differences or inconsistencies between their pre-placement perceptions and their perceptions six-months later.

5.7 Results

5.7.1 Structure of themes

Data analysis followed a similar phenomenographic approach discussed in Chapter 3, p.74 of this thesis identifying conceptions and separated into two themes as detailed in figure 17 below. The first theme relates to the participants’ memories of learning both in the HEI and on clinical placement and relate to the participants’ thoughts on the initial study block. This theme also evokes responses about transference of knowledge and skill from the classroom (traditional and simulated) into the clinical environment and relates to the final research question exploring higher order learning.

The second theme, learning in the HEI vs clinical placement elicits data relating to the participants’ views and beliefs in relation to their overall learning experience and the strengths or limitations of these.
Figure 17: Data analysis showing two themes from first year ODP students’ follow-up FGIs six months into their course of study

5.7.2 Theme 1: transference: initial study block into clinical practice

All participants had spent the same amount of clinical time in placement and were guided in their learning by clinical educators, registered practitioners and training managers. Each had observed different types of surgical and anaesthetic procedures, as well as different patient groups. This is usual for a cohort at this stage of learning but the focus group interview schedule aimed to elicit perceptions relating to the totality of their learning to date.

[M41-FG1] I think it helped - you’re a couple of steps ahead. So for example, you don’t need to explain to me how to scrub, because you’ve already been
taught it in Uni … that meant for me personally they watched me a couple of times and then they were happy with my technique …

[M28-FG3] I think that anaesthetics was most useful for that … you got to use things and touch them at uni and then when your onto your placement there’s so many different things … everything’s just ready so knowing what it does already … that familiarisation is really useful …

[M29-FG1] I have to be honest … when it talks (manikin) it freaks me out and I totally lose it but when I’m in placement and the patients speaks that’s no problem at all …

[F29-FG1] yeah and when it blinks … I like the area and the kit but not the dummy so much.

[F25-FG4] It’s things that we have learnt in the classroom and then in simulators that helps a lot … I impressed a surgeon by talking about the neuromuscular junction and he was like … are you sure you’re a first year? You’re not lying? So it’s things like that you take away into practise and it makes us better students in the sense that we already have a grounding of knowledge before we even get there …

The vignettes above discuss the transference of taught knowledge and skill from the HEI into the clinical learning environment. The participants converge on the application of their taught knowledge into the clinical environment. This indicates that they recognise and are able to perform tasks such as scrub, application of theory (neuromuscular junction) and anaesthesia, in terms of equipment and uses, even when they have not prepared it themselves as M28-FG3 discusses;
'everything’s just ready so knowing what it does already … that familiarisation is really useful …

There are however, barriers articulated by the participants, particularly relating to the manikin talking and responding to the students and the physical movements such as blinking. At first these potential barriers to learning were not apparent with these participants, but require acknowledgement and managing for future students who may participate in simulation. Transference from the classroom is imperative if the learning experience is to be effective and higher order learning relies on students being able to synthesise and apply new knowledge. They must learn to care in a fast-changing environment and adapt accordingly to changing situations.

[M33-FG5] So it’s all good seeing it in the classroom but when you walk in and see the dummy you’re like right, let’s go! It helps to be able to see it from different perspectives and then when I was in placement I was like wow I’ve seen that before … I know what to do next … I’m getting some really good feedback from my mentors … I don’t think I would get that without simulators …

[M26-FG5] I have had many penny-dropping moments … where you go … so that’s why they taught us that! I get it now … I totally get it … and my mentor is like … how do you know that so early?

[M41-FG1] It’s amazing that so early things seem to make sense - it’s a practical job and we need to know how to do things and not just why … I keep going back to the video we watched and watching it again …
the other thing is … when I was in recovery doing a jaw thrust I can be a ‘bit’ ginger (field notes show that this participant is demonstrating a jaw thrust and discussing he can be a bit too strong) even though we’ve had practice on the mannequins here it means that we can practice on something we can’t hurt or kill … I remembered that when I was doing it on a small lady …

and it makes me feel like I’m holding my own….I know what I’m doing but also I know what I can’t do yet…

yeah.

The participants were discussing that they feel they have ‘early’ knowledge of different clinical skills and how to perform them; clinical educators support this in some instances. F31-FG4 identifies that she also knows what she cannot do; she realises limitations in her knowledge and ability. Realisation of limitations is crucial in the safe effective care delivery from professionals and students to patients and service users. It would not be an expectation from the HEI that all students would be able to acknowledge their own limitations until towards the end of the programme of study where thoughts turn to professional registration and thereafter employment.

I just think that we have been quite lucky even though it was hard I think that now I think back I remembered not all but lots of what we did and that made me think, well at least it doesn’t feel like my first day!

well I had never been into theatre before but they were fine with me … I was really nervous but then I discussed what I knew on my first day and my mentor said, well let’s see what you know … I was ok with talking to
patients and the anaesthetist and we did some GA’s (General anaesthetics) and I could do them in the right order and knew what I was doing.

[F43-FG2] It’s just getting accepted and then being taught, they want to see who you are and what you know, probably trying to pitch where to teach but I think my mentor was happy with me … I even asked him a question about assessing waterlow scores and he had to find out from the scrubber …

The final set of vignettes for theme 1 discusses the participants’ feelings of being accepted and able to communicate with peers. Often feedback from previous students undertaking a traditional curriculum identify the process of being inducted into a placement as being scary or frightening, but the quotes above see the students feeling accepted and ‘not nervous’. In addition the environment seemed familiar to them, suggesting a level of transference from simulated activities into the clinical area. M47-FG5 discusses that it didn’t feel like his first day on placement because of this and F43-FG2 is feeling confident enough to ask questions, the complexity of which her clinical educator wasn’t able to answer. Whilst these phenomena of acceptance seem shared amongst the participants, further investigation into the perceived differences between learning in the HEI and learning on clinical placement is necessary to find out from the participant’s perspective what the strengths and barriers of each are.

Key findings of this theme are:

- Participants reflect that learning in the HEI transferred into clinical placement
- Preparation was deemed successful in terms of knowledge transfer from the HEI into placement
- Participants’ realisation of limitations when on placement became apparent
- Barriers to learning using simulation were discussed

5.7.3 Theme 2: learning in the HEI vs learning in placement

This theme refers to the students comparing traditional and revised curricula amongst themselves and sharing their experiences of learning with peers. Often first year students share the same theatre along with second year students and this can be an advantage in having a ‘friendly face’ to help the new student settle into placement.

[F24-FG2] We talked about how it had all changed this year … the second years said they had gone into placement within a few weeks, out into practice….they changed it this year, that must be difficult ...

[INT] What did they say about that?

[F24-FG2] I think that the general thing that they were saying was that they went out to placement too early … and people dropped out because of that, that’s what the general feeling from their group was, 4 weeks in Uni and then straight out …

[INT] What do you think about that?

[F24-FG2] too early - no way!
[ALL] yeah. [field notes show agreement and physical expressions that infer that the participants feel going into placement after four weeks, as dictated by the traditional curriculum would not be desirable to them]

[M28-FG2] The others said that they felt like idiots because they didn’t have a clue what they were doing and just told to watch - that’s why our block (initial study block from Sep-Dec) was so good we had loads of time and the simulators - that’s why simulation was so good, small groups and learning the things that are expected from placement …

F24-FG2 is recalling a conversation with a second year student and reflecting that they (second year students) felt that they were exposed to clinical learning too early and this caused attrition amongst the cohort. In addition this focus group is united in the feeling that the traditional curriculum would send them into placement too early.

Participant M28-FG2 reflects that simulation and small group learning was good to learn the things required for placement. The discussion already has the FGI participants reflecting that their experiences of the revised curriculum at the University of Portsmouth were better [in their opinions] than that of the previous curriculum and early placement.

[F33-FG3] the thing is I knew what to expect, theatres are busy places and people don’t always have time to stop and talk or explain things and that can be a real problem … I don’t know how people with no experience cope … or would cope without our study block

[F27-FG3] yeah I know … except the only way to really learn is to be in there and experience it … but a few times I was told, don’t scrub for this or I’ll do
that by my mentor … either because of the surgeon or because he didn’t trust me to do it and that gets annoying when you actually know what you should be doing … i think that they don’t understand what we’ve been taught already.

[F19-FG4] I think it might be to do with the way we were taught - other groups are usually in really quickly but they didn’t know very much and then we haven’t been to placement until after Christmas and they don’t really know what we’ve been doing or how much we know …

The vignettes above describe the participants’ opinion that the clinical educators were unaware of the students’ capabilities after the extended study block. This leads to frustration where the learner is not allowed to participate in clinical activity. This could be a counter-productive period in the students’ learning experience when they feel that they were ready to undertake learning and become more involved but were held back from doing so.

This notion of clinical educators appearing disparate to the learners’ needs requires further investigation to ensure that the HEI and placement learning methods compliment each other in enhancing the students’ learning experience.

[F38-FG5] that said I think now that I have settled in and have a routine I prefer to be learning in placement than back at the Uni… we seem to be doing much more written work now and less and less practical’s …

[F40-FG3] I think that I was expecting study blocks to be similar to the first one before Christmas, y’know do some classroom stuff and then go and apply it more in the mock theatre … I would like more time in there, even if it’s
practising things on my own, particularly things that I have seen and thought … hmmm I could do with doing that again so I get it right in my own head …

[M24-FG4] Do you know if we are allowed to come in here and use the mannequins? The thing is that I haven’t done obstetrics yet but some others have and we could get together and practise, my obstetric placement isn’t until next year…

The final vignettes above suggest that the participants have a preference of learning and that there is a desire to undertake more simulation and be able to practice what they have learned clinically, within the simulated facilities.

The participants suggest that using the simulated facilities to help them understand what they have learnt clinically and undertaking simulation-based peer learning, helps them to understand the different placement experiences of others and offers aspects of comparison between different learning experiences.

**Key findings of this theme:**

- Participants feeling confident but identifying that clinical mentors were less knowledgeable of the revised curriculum at the University of Portsmouth that they had undertaken and so did not fully realise the learner’s potential
- Participants identify value in simulation-based learning and that they see it as an effective teaching method which they look forward to in future study blocks
5.8 Discussion of Study Three and Study Four: the first year ODP student studies

This section discusses the results from Study Three and Study Four. Both of these studies monitored the same participants through the revised curriculum at the University of Portsmouth and following their first clinical placement experience. The results identify several important aspects, such as:

- Participant’s ability to transfer knowledge and skills from the HEI into the clinical learning area
- A perception of preparedness for clinical placement learning
- Comparisons between peers in relation to learning via traditional and revised curricula
- Facilitation of equal learning opportunities for all students
- Development of confidence through simulation-based learning

5.8.1 Main findings of Study Three

The Third Study reported on the participants’ views of learning via the revised curriculum by conducting focus group interviews with 30 members of the first year ODP cohort. The participants undertook an intensive 12-week study block in the HEI, engaging all participants in simulation-based learning prior to assessments being undertaken (OSCE’s). Issues such as, unlearning poor or inappropriate experiential learning for those with previous clinical experience prior to beginning the ODP course, juxtaposed with creating new knowledge for other cohort members who had no experience at all of the perioperative environment, were identified.
The participants reported general satisfaction with their initial study block and that the time spent in the HEI had gone quickly. In addition, participants reported that they felt prepared to go into placement and that they had elevated confidence in their individual knowledge and ability. Vignettes that exemplify this include: M28-FG2-NPE: *you seem to hit the ground running and don’t stop, I can’t believe we’re about to go out ...* and F40-FG3 PE: *It’s gone so fast because of what we have done.* Doing things correctly and achieving a standard in comparison to other known staff members was reportedly important in perpetuating the learning desire.

Participants also reported increasing confidence commensurate with ability and this grew as the study block progressed. With this came a desire to continue learning such as … F24-FG2 NPE: *I’ve already learnt that here, the proper way and that makes me feel really good, I can’t wait to go out and show them how its done - you’ve got a little voomph [sic] you know.* Brannan et al. (2008b) discusses that this confidence can encourage a desire and excitement to demonstrate their knowledge and skill to others.

The participants also discussed the notion of being able to work as a team and therefore expand their knowledge from the ‘self’ into anticipation of the team approach to patient care, which Wallin (2007) describes as altering behaviour using a team approach in simulation activities. Evidence such as M47-FG1 NPE *Because you feel like your achieving....the whole thing is a team and it’s an achievement,* *that makes me confident in doing a good job.* Themes generated from the units of data relate to the constructive disassembling of pre-conceived belief and reassembling or constructing knowledge through theoretical application to simulated clinical scenarios for those students with prior clinical experience in an un-registered role.
A conclusion from this study can be drawn that the participants were projecting themselves into a position of moral dualism\textsuperscript{15} as Gisondi et al (2004) discusses. They appear to be transforming from the apprentice into the master by their comparison of situations and rationalising why actions must be appropriate as highlighted by the vignettes above. Higher order learning, demonstrable through such transformation would not be expected at such an early stage of learning and shows that a collective holistic approach to patient care is being nurtured (Fox & Mackeogh, 2003).

5.8.2 Main findings of Study Four

The Fourth Study involved the same participants as Study Three in repeat focus group interviews six months into their ODP course and was designed to gather the participants’ thoughts and perceptions of their learning to date (both HEI and clinical placement). The participants discussed transference when they reflected on their learning in the HEI and application of that learning in clinical placement. Issues such as: being familiar with equipment; communicative needs; patient care; theatre etiquette; anaesthesia and surgical processes; as well as contextualising learned skills were verbalised by participants.

Transference was articulated in cognitive and psychomotor domains, illuminated by vignettes such as F25-FG4 discussing their conversation with a surgeon who was surprised at the participant’s knowledge for their stage of course. F25-FG4 states: \textit{It’s things that we have learnt in the classroom and then in simulators that helps a lot … I impressed a surgeon by talking about the neuromuscular junction and he was like … are you sure you’re a first year?} F25-FG4 identifies that she had a

\textsuperscript{15} Moral dualism refers to the individual knowing the differences between good and bad - right or wrong.
grounding of knowledge that she took from the classroom whilst M28-FG3 highlights familiarisation with learning on placement and this was as a result of his preparation at the HEI. This is similar to the results found by Kneebone et al. (2002) but expands the understanding of why and how knowledge transfers for this population.

The participants in this study through quotations such as M41-FG1 discuss psychomotor transference: *I think it helped - you’re a couple of steps ahead. So for example, you don’t need to explain to me how to scrub, because you’ve already been taught it in uni …* and M28-FG3: *I think that anaesthetics was most useful for that, you got to use things and touch them at uni … everything’s just ready so knowing what it does already … that familiarisation is really useful* show these respondents were able to demonstrate functional knowledge on placement in scrub and anaesthetics from what they had been taught in the HEI.

In addition, there were statements from these participants that they felt accepted into the clinical placement and for some it did not feel like the first day or that they were nervous such as, F43-FG2 stating ... *It’s just getting accepted and then being taught, they want to see who you are and what you know, probably trying to pitch where to teach but I think my mentor was happy with me … I even asked him a question about assessing waterlow scores and he had to find out from the scrubber.*

This exemplifies a positive impact for the respondents and shows that their experience of learning in this way was transferable between environments in cognitive and psychomotor abilities, uniquely advancing knowledge by demonstrating transference for this population, six months into their ODP course.

Transference of learning into clinical practice is crucial (Domuracki et al., 2009) but is barely discussed in the literature with only four studies being highlighted in a
systematic review by Cooper et al. (2012) and only one study being followed up three months later (Birch et al., 2007). The results therefore, further add to the existing evidence base whilst also answering the third question that informed this research.

Essentially, the learners were exposed to the same ‘experience’ through simulation and this had the effect of mitigating the potential inequity of placement learning caused by different clinical experiences. Undertaking peer learning and group activities in simulation, as well as students sharing and practising their individual clinical experiences, helped to further develop knowledge whilst differences in meaning were controlled and simplified by the simulated activities staying the same.

The participants report that the feeling of achievement was the catalyst for elevated self-efficacy and confidence. Perhaps more importantly, participants identified that performing correctly and achieving a defined standard of professionalism towards patients and colleagues was important in perpetuating their desire to learn. They also discussed that being able to work as a team and therefore expand their professional frame of reference from the self to (anticipation of) the professional team approach to patient care.

Studies Three and Four offer new insight into why and how the revised curriculum at the University of Portsmouth has impacted on these participants in terms of theoretical knowledge, transferability of clinical skill, self-confidence and acceptance into the clinical environment by other perioperative staff.

In addition, the results infer that HEI learning transferred into clinical placement learning and aspects of knowing, professionalism and understanding their role within the perioperative team. This demonstrates transferable knowledge and
clinical skills from the learning undertaken in the HEI into the clinical placement by following the revised ODP curriculum integrating simulation-based learning. It is arguable that previous cohorts of students would not achieve such results whilst following the traditional, non-simulation based ODP curriculum. The peer discussions between first and second year students as well as the results of Study One exemplify this.

5.9 Study Five: a study of clinical education managers: investigating attitudes and reflections on student ODP abilities, following the implementation of the revised curriculum

5.9.1 Introduction

This programme of research aims to investigate the effectiveness of ‘traditional’ ODP teaching and learning and evaluate a revised curriculum that integrates simulation-based teaching and learning for ODP students. The final study reported here explores the subject of implementation of the revised curriculum at the University of Portsmouth, from the perspectives of training managers who organise and manage clinical learning.

Turner (2001) discusses barriers to clinical placement education including the lack of capacity of clinical educators providing a full service due to the pressure that is placed on the shoulders of them. High patient turnover and the requirements to have dedicated time to teach the student appropriately instead of grafting experience into a busy working day is a must be considered when organising placement learning. This is further compounded by the increasing demands for suitable placements (Bennett, 2003). In the UK there are many learners who require exposure to clinical placements, not just ODPs in the perioperative environment.
Therefore, similar to the necessity of consulting clinical education managers during the development of the revised academic curriculum for ODPs, it was as important to elicit their views on the changes made.

5.9.2 Aim

The aim of this Study Five was to understand the experiences of education managers who had facilitated six months of clinical learning for the ODP students undertaking the revised curriculum at the University of Portsmouth.

5.10 Method

5.10.1 Design

A qualitative approach informed by descriptive phenomenographic was taken to elicit data from the participants. Education managers are employed by their host organisation either in the NHS or private sector and are the primary educational contact for all clinical placement issues including student allocation, management of the learning process and quality management. Moreover, this places education managers in the prime position to reflect on the performance of the first year ODP students.

5.10.2 Sample

The population consisted of placement educators (n=12) who were recruited to a focus group interview. The participants were recruited via a purposive method with the eligibility criteria of being directly involved with the management and provision of the day-to-day learning of the first year ODP cohort of students. Initial contact was made with the education managers following a meeting in January 2011 where
education managers attend the HEI for course specific liaison meetings. An explanation of this study was presented to all region-wide education managers from both NHS and private healthcare organisations and a participant information sheet and consent form (appendix 5) was given to each manager to consider whether or not to take part in this study (Nyamanthi & Shuer, 1990; Polit & Hungler, 1999). Both documents contained information in relation to the study, that participation was voluntary and that withdrawal without consequence was always available (see Chapter 3 for specific ethical details of this study).

Sample size was aimed at trying to include as many education managers who met the eligibility criteria and led to data saturation (Glesne & Peshkin, 1992; Procter & Allan, 2009). Twelve participants were recruited to this study and that is representative of all placement areas that this cohort of ODP students would learn in.

All of the participants for this study had different experiences of working as clinical educator managers as table 13 shows. The participants represented clinical placements in the NHS and private sector and supported different specialities and skill mix. What the participants have in common is that they were integral to the delivery of the ODP course and partners in curriculum design and clinical implementation. Each of the clinical education managers has attended and passed a mentorship course at the HEI and their clinical placement area is subject to biennial educational audit to ensure that the placement area is fit for purpose in the support of students and delivery of the curriculum at the University of Portsmouth.
Table 13: Participant demographics for Study Five: clinical education managers

<table>
<thead>
<tr>
<th>Participant</th>
<th>Gender</th>
<th>Profession</th>
<th>Organisation</th>
<th>Location</th>
<th>Education experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>M</td>
<td>ODP</td>
<td>Private</td>
<td>Eastleigh</td>
<td>3 years</td>
</tr>
<tr>
<td>P2</td>
<td>F</td>
<td>ODP</td>
<td>NHS</td>
<td>Portsmouth</td>
<td>10 years</td>
</tr>
<tr>
<td>P3</td>
<td>M</td>
<td>ODP</td>
<td>NHS</td>
<td>Southampton</td>
<td>6 years</td>
</tr>
<tr>
<td>P4</td>
<td>M</td>
<td>Nurse</td>
<td>NHS</td>
<td>Basingstoke</td>
<td>12 years</td>
</tr>
<tr>
<td>P5</td>
<td>F</td>
<td>ODP</td>
<td>NHS</td>
<td>Winchester</td>
<td>1 year</td>
</tr>
<tr>
<td>P6</td>
<td>F</td>
<td>ODP</td>
<td>Private</td>
<td>Havant</td>
<td>5 years</td>
</tr>
<tr>
<td>P7</td>
<td>F</td>
<td>Nurse</td>
<td>Private</td>
<td>Eastleigh</td>
<td>3 years</td>
</tr>
<tr>
<td>P8</td>
<td>F</td>
<td>Nurse</td>
<td>Private</td>
<td>Winchester</td>
<td>2 years</td>
</tr>
<tr>
<td>P9</td>
<td>M</td>
<td>ODP</td>
<td>NHS</td>
<td>Portsmouth</td>
<td>10 years</td>
</tr>
<tr>
<td>P10</td>
<td>M</td>
<td>Nurse</td>
<td>Private</td>
<td>Southampton</td>
<td>7 years</td>
</tr>
<tr>
<td>P11</td>
<td>F</td>
<td>Nurse</td>
<td>NHS</td>
<td>Southampton</td>
<td>10 years</td>
</tr>
<tr>
<td>P12</td>
<td>F</td>
<td>Nurse</td>
<td>NHS</td>
<td>Basingstoke</td>
<td>5 years</td>
</tr>
</tbody>
</table>

5.10.3 Data collection

Participants attended a FGI at the HEI in April 2011 and were asked to reflect on their perceptions, views and experiences of managing the learning for the cohort of students who had undertaken the revised ODP curriculum at the University of Portsmouth. All participants were allocated an identifier number ranging from 1-12 which, during transcription analysis, facilitated following the FGI and who was saying what. This helped with the analysis of the transcriptions and development of conceptions and themes by allowing the researcher to identify thoughts and perceptions from differing views and lived experiences of the participants (Giorgi, 1999).

The transcripts from the FGI were imported into an electronic data management software package (Max QDA™). This facilitated the identification of units of data and the convergence of ideas and perceptions of phenomena from differing backgrounds and approaches of the participants. Following the steps of data analysis and by reducing common conceptions, meaningful themes were formed.
5.11 Results

5.11.1 Structure of themes

As can be seen in Table 13 above, the clinical education managers have varying experience in clinical education delivery. These include managing learning for diverse students and staff within their organisation. Therefore, participants were accustomed to evaluating student learning and delivering feedback to the student and the HEI on performance and competence issues. Analysis of the data formed two themes as figure 18 shows.

![Diagram showing two themes](#)

Figure 18: The two themes resulting from the clinical educators FGIs
5.11.2 Theme 1: learning away from the clinical environment

The clinical education managers discussed their perceptions of the changes to the curriculum and the learning that the students had undertaken in the HEI. There was a focus on the type of learning and assessment that was undertaken by the students and how that manifested in practice, for example:

[P1] I had a better idea [of the revised curriculum], my understanding was they do a lot of simulation now - and the outcomes from the university is that they do all of the lectures first and then they put that into practice in simulation.

[P2] in small groups

[P1] yeah, and then they have OSCEs to assess their knowledge before they come out to us …

[P5] it must be quite intensive … it was intensive before, my students were surprised at how much they knew already, so was I, they used to come out with a little bit of A&P and health and safety but this cohort have been assessed in anaesthetics, scrub and recovery.

[P2] I think what surprised me the most was that the ones that are brand new to the environment and have never been in theatres before are at the same standard as the rest.

[P1] well they will all have the same OSCEs…

The participants were indicating that the ability of the students who have undertaken the revised curriculum is greater than previous students that they have experienced.
They recognise that all of the students were at a similar taught level, that is those students with no previous clinical experience were the same as those who have had previous clinical experience in unregistered support roles prior to beginning their ODP course.

[P3] I have had six of the first years and was a little concerned that they had missed so much clinical time, even though I knew they were learning differently here … The thing is that I like to settle them in before Christmas and then we really start in the new year …

[P4] I had some of the same reservations but actually they seem to have settled in really quickly.

[P3] I know, I know, I was just about to say that … I did an interview with them all to introduce them to this hospital and I was asking what they had been doing and that they would normally be in by now, they were really keen to get started clinically but I was surprised at what they knew and they seemed to be quite confident … not nervous …

[P8] I noticed that.

[P3] It could be that there were six but I’m used to having a few that are quite scared and that I have to settle down.

The participants above were discussing their initial meetings with the first year ODP students and express concern at not having the students into placement at the usual, historical point in the traditional non simulation-based curriculum. There is discussion however, that the students have ‘settled’ in quickly. In addition P3 discusses perceived confidence of the students that P8 confirms. P3 also discusses
that they [practice educator] would usually spend the clinical time prior to the Christmas break settling the students ‘in’ to the placement area. Spending what would normally be a four - week placement ‘settling in’ students is a long time and potentially a lot of missed opportunity in terms of clinical learning.

[P8] I think that any changes to the way they knew students are taught… that encourages them to be more confident and learn quicker has to be good, I think that the curriculum itself hasn’t changed but the way it is taught has and if that means that they miss a clinical placement but they have more accelerated learning here [HEI] then that’s good, better for us when they get here … these slotted in very quickly.

[P12] I agree … very quickly … and it takes the pressure off us a little bit because usually we have all of the different student’s [different professional groups] all turning up within the same week, that makes it difficult to try and allocate everyone….with the ODPs turning up after Christmas it means that we have more time and then we can plan the rotation better and have a little more capacity.

These vignettes indicate that the participants thought about the effect that the reduction of clinical time has had on their workload. Inevitably, where students were not in clinical placement it reduces the workload on clinical managers, mentors and the perioperative area itself. With the increase in demand for specialist placements, any reduction in demand is seen as advantageous. P8 identifies this but also articulates that this reduction in clinical placement learning should not be at the expense of student learning. P12 agrees with P8’s final comment of the students ‘slotting in quickly’, which infers that they agree on the students adapting to
placement learning but stop short at sharing that the reason for this quick adaption was the result of the revised curriculum at the University of Portsmouth.

5.11.3 Theme 2: application of knowledge and skills

This theme takes the subject of curriculum design and learning further and includes the idea of transference of knowledge and skill from the HEI into the clinical placement area. For the implementation of simulation into the ODP curriculum and the attainment of the desire for higher order learning by the students there must be demonstrable advantages of learning in this way. Advantages could include, clearer safety, better ability, more confidence, enhanced patient care, learning more quickly, learning more deeply and better use of resources and clinical placement learning time.

[P3] They just walked in and got on with it - I put my students with the usual first timer mentors that I usually use and then at the end of the first week I got the mentors together … they were all impressed with the students ability to settle into the team, we had no problems!

[P1] Ours did … they had the mentors on their toes…what did you do?

[P11] It’s like the nail varnish effect … little input from me but what I did notice is their reaction when they didn’t know what to do … y’know when sometimes they don’t realise when it’s wrong, well one of ours said … ‘I can’t do that’ and the mentor said why not? And they said ‘ because we’ve been told and taught not to’

[P5] We had one who was double scrubbed talking the reg through the NMJ … you could see the surprise on the surgeon’s face …
The participants discussed the students’ adaptation to working within their respective clinical environments and surgical teams. Discussions indicate that the students keeping the staff ‘on their toes’ and that the students were able to question actions or discuss clinical subjects with other professionals. Field notes show that there was excitement amongst the participants now that they were formally reflecting on the students’ behaviour as a group and that there were similar reflections being shared.

The quotation from P5 discusses that a student was talking to a surgeon (surgical registrar) about the NMJ (neuro-muscular junction). This is a complex physiological event that was historically taught using didactic methods and was reported earlier in Study Four. In the revised curriculum at the University of Portsmouth, didactic methods were enhanced with demonstrable, real-time application of neuromuscular blocking drugs on a hi-fidelity manikin. Students experienced paralysis of the manikin, demonstrating ideal conditions for endotracheal intubation and complex surgical intervention, where incision through musculature of the patients is required.

In addition, students were taught the process and theory of reversal of neuromuscular blockade in the simulated operating theatre, by taking part in nerve stimulation tests to identify the level of neuromuscular blockade. The quotation from P5 above infers transference of that learning from simulation into the placement area and has resulted in the student holding dialogue with the surgeon on the theory and application of interventions with the NMJ, causing the surgeon surprise.

[P11] I took my students on the usual tour of the department that we always do, I took them to get changed and they all managed to turn out properly! No hair issues or jewellery… I was quite impressed with that … I usually have to spend 20 minutes getting nail varnish off!!!
[P7] Me too, the other thing is that we had a theatre down because of the ventilation so I took them into it to show them around and the kind of equipment we use … they were asking quite good questions and kept referring to the types of equipment in uni …

[P9] And their paperwork, they knew what they needed to achieve in this placement and we discussed how that might be achieved, they were clearly aware of what was needed and that it wouldn’t matter which perioperative area they were in.

[P10] I missed some of the last few meetings [clinical liaison group] and wish I had caught up, or had been caught up on what the changes were going to involve … I felt like I was catching up with the students, they knew more about what they needed than I did and that was a bit of a problem.

[P2] Me too in some areas, I’m used to doing what I do and that’s changed now

[P12] The thing is, if the changes made [to the curriculum] stay as they have been for these students then we’ll have a much clearer idea next time … they [students] do seem to have much more knowledge than other students….maybe the uni can catch us up after this has been evaluated?

Two main points were articulated in the vignettes above. The first is that the participants reflect that the students who have undertaken the revised curriculum adapted to the clinical environment quickly and were able to make inferences in terms of different types of equipment than that which they had experienced during simulation sessions in the HEI. The second is that the participants comment on their own lack of knowledge of the revised curriculum and that their normal approach to
managing the students' learning experience during the initial clinical placement required adaptation because of the (students') knowledge.

For example, if the placement provider spends two days on core clinical training for new staff and learners, followed by clinical lectures on dressing to suit the environment, this could be time wasted, as the HEI would have already taught these subjects in simulation. Instead, less time could be spent confirming students' knowledge; however from the vignettes above, it is apparent that some clinical educators were not aware of what had been taught to the students using the revised curriculum at the University of Portsmouth, and therefore facilitated the students' perceived needs on placement as they had for previous cohorts of students undertaking the traditional curriculum.

[P1] The feedback I have had is that they have been professional, courteous and studious, that's not to say that other students aren't but sometimes we have to remind them … they have got on with it very quickly in scrub and anaesthetics, we don’t put ours into recovery this early … That makes a massive difference … the staff are happy and that helps with them teaching.

[P6] I agree with that, ours have been following a patient at least twice a week and then I held a workshop for them last week to discuss practice outcomes … they were talking about the WHO checklist and taking part in it as well as being able to talk through the patients journey which was great … the mentors have had no reservations signing them off for these competencies …

[P11] The other thing is manual handling, usually they'll stand back but mine have got right in there and have taken part in moving patients and that’s lovely to see, they take part and communicate well with the rest of the team and in
orthopaedics that can be tough … very impressed with them just getting involved, but safely.

[P7] No problems with mine getting signed off either and they are enthusiastic, very keen to learn but also complimentary to what they have learnt so far, sometimes in the past students are a bit ‘them and us’ between the HEI and placement ... this time it’s less, in fact we’ve had no mention … what they are doing is comparing methods of doing things and equipment that is different from uni.

The participants discussed the students learning and performing as a student within a perioperative team. They express that the students reached their required level of practice outcomes as required by the statutory body and the HEI practice assessment document effectively. Furthermore, P7 discusses that the students demonstrated respect for others, suggesting that the students involved demonstrated a holistic view of their learning between the HEI and the clinical placement area. In addition, practical knowledge and ability (in terms of assessing practice outcomes) is different between this group of students and previous students. In addition, there were examples of students’ cognition where comparing experiences and equipment between placement and University.

Key findings of this study:

- Participants identify that the ODP students acclimatised more quickly into the clinical environment than previous cohorts
- Knowledge and skills demonstrated by these students were of a higher standard than previous cohorts of ODP learners
There is a perceived lack of knowledge of the revised curriculum at the University of Portsmouth articulated by some participants.

Participants confirmed the results of Study Four.

5.12 Discussion

5.12.1 Main findings of Study Five

Clinical educators were the focus for the fifth study and 12 participants were invited and consented to participate in a focus group interview to discuss their perceptions, thoughts and concerns in relation to the revised curriculum at the University of Portsmouth. Others have already demonstrated that clinical learning is crucial in preparing and teaching professionals through formal and informal channels and should be a mutual partnership (Brown et al., 2011; Moosavi et al., 2013). Therefore, it was important to gather a different point of view regarding the changes made to the curriculum.

On the whole, the clinical educators were positive about the changes made to the curriculum and could see changes to the attitudes, knowledge and ability of the cohort that had undertaken the revised curriculum at the University of Portsmouth. This is evident through vignettes such as: P2 I think what surprised me the most was that the ones that are brand new to the environment and have never been in theatres before are at the same standard as the rest and P8 I think that any changes to the way they knew students are taught … that encourages them to be more confident and learn quicker has to be good … but [if] they have more accelerated learning here [HEI] then that’s good, better for us when they get here … these slotted in very quickly.
It was felt that preparing the students to learn clinically through a revised curriculum would make the role of the clinical educator slightly easier by mitigating issues such as equality and lack of capacity which Turner (2001) discusses as being challenging. Adequate preparation to join the department was discussed by the clinical educators, using terms such as ‘settling in quickly’ and conducting themselves (students) in a professional way such as:

P12 … and it takes the pressure off us a little bit because usually we have all of the different students [different professional groups] all turning up within the same week, that makes it difficult to try and allocate everyone … with the ODPs turning up after Christmas it means that we have more time and then we can plan the rotation better and have a little more capacity.

The results infer several key factors that, combined with the results of studies Three and Four, answer the final question for this programme of research. For example, the clinical educators discuss observable differences in the cohort of ODP students who have undertaken the revised curriculum at the University of Portsmouth. Consistent with other studies there are noticeable differences in the students’ communicative ability and self-efficacy (Aliner et al., 2006; Burns, O'Donnell, & Artman, 2010; Butter et al., 2010; Clancy et al., 2002; Clapper & Kardong-Edgren, 2012).

There were also reported enhancements to the students’ ability to perform in the perioperative environment and recognise and use equipment that would have been previously unknown to them. These findings are consistent with previous studies that research part-task training and simulated learning activities and retention or application of knowledge (Baillie & Curzio, 2009; Brindley et al., 2010; Curran et al.,
2004; Domuracki et al., 2009; Forest et al., 2002; Ironside et al., 2009; Issenberg et al., 2005) but add the ODP population to that body of knowledge.

Furthermore, the clinical educators report that the students were ‘settled in’ to the department more quickly than previous cohorts of students which is crucial to the development and teaching of the students (Bahn, 2001; Benzie, Mavers, Somekh, & Cisneros-Cohernour, 2005). There is a reported ability of the students to be able to conduct themselves in a professional manner very early into their clinical placement and this encourages adoption by other staff members within the perioperative area and therefore enhances the processes of learning and acceptance (Lave & Wenger, 1991; Wenger, 1998).

Nevertheless, some aspects of the clinical managers’ comments require addressing. Quotations such as: ‘I wish I had caught up with the changes’ from P10 and P2 stating: ‘I’m used to doing what I do and that’s changed now’ highlight the need to involve the clinical education managers (at the minimum) with the revised curriculum in a more meaningful and active way, such as inviting them in to help teach students or annually updating them on curriculum changes through mentorship workshops.

The clinical educators did discuss that they felt sometimes behind the students in terms of knowing what they had been taught in the HEI and the level to which the students had been assessed prior to their first clinical placement. Participants reported in Study Three and Four, who identify that sometimes the clinical staff would not let the student engage in certain practices because they were unaware of their knowledge or ability, echo this. Clinical educators must be able to make decisions relating to competence, they must assess the students objectively against the curriculum requirements and be aware of the specific teaching and learning
undertaken by students in the HEI. If this is not the case then this will cause a theory-practice gap between the HEI and clinical placement, which is undesirable.

5.13 Revised conceptual framework for simulation-based learning

Based on the results of the final three studies reported in this Chapter, a new conceptual framework was developed as figure 19 shows. A conceptual framework consists of known knowledge regarding a given subject (Meyer & Land, 2005; Robertson & Bandali, 2008). An attempt has been made to provide a new conceptual framework to try to address the barriers of ‘traditional’ learning and enablers of simulation-based teaching for ODPs. In comparison to the Jeffries (2005) model of learning in simulation.

The conceptual framework presented here shares some similarities such as the need to prepare students in order to manage expectations and the need for educator attention to resource and fidelity requirements. However, differences include the identification of preparing staff for debriefing, the development of a learning community of practice using simulation-based techniques and the affordances that this offers, and the recognition that the components that make up this conceptual framework have been informed by research conducted directly with ODP students and professionals.

For example, it has been identified through the research presented in this thesis that the preparation of teachers in the use of simulation is paramount to its success. The precise use of learning theory to inform either algorithmic learning or autonomous practice are key to employing simulation-based learning activities to their best use. That said there could be no automatic expectation that all educators were prepared
and capable of using this pedagogic approach and in that instance, would require some formal or informal preparation themselves. This is the purpose of section one of this conceptual framework and highlights areas that require further consideration.
Figure 19: A revised conceptual framework: simulation augmented learning for ODPs
In addition, as this research has demonstrated and shown in section two of the conceptual framework in figure 19, students’ expectations of learning in simulation-based activities needs to be managed effectively to ensure that they understand the needs of the curriculum and that the learning meets their expectations involved. One major difference between learning in simulation and other teaching and learning activities are that students become quickly aware of their capabilities and limitations during the simulation-based activities.

Rather than waiting for a point in time to be assessed, the immediate performance of the individual is provided with feedback and the opportunity to practice and develop further knowledge and ability. Furthermore those students who require more time to develop skills which may require additional resources and time, will need to be managed and facilitated.

Section three of the conceptual framework identifies aspects of simulation that require management by educators prior to teaching. This should include those responsible for managing the simulation-based learning experience having firstly, planned and evaluated the availability of equipment and how it may be used. Students are likely to require considerable time to learn in simulation and an under-resourced facility will not meet either the student or staff expectations of a quality learning experience.

There should be recognition and clear delineation between part-task training and immersive simulation resources, thereby minimising under use of expensive and scarce simulation resources for activities that can be achieved in other ways (cannulation being a simple psychomotor skill that can be developed using part-task training techniques for example). It is also arguable that quality learning relies on
suitable and adequate debriefing of the learner’s strengths and limitations. This may be conducted as a group or team activity, or more often on an individual ‘post-activity’ basis. Debriefing must be taken seriously and cannot be assumed and must therefore, be provided for.

The final section of the conceptual framework refers to students undertaking simulation-based learning developing teamwork skills and knowledge that can be directly transferrable to clinical learning. In addition, the opportunity to rehearse activities or clinical situations and also let situations evolve and transpire ‘realistically’, a learning process that is usually reserved for clinical learning alone is an effective and desirable method of learning. This was demonstrated in Study Four where respondents reported transference of learned skill in simulation-based activities into the clinical area.

Additionally, the development of a professional learning community should not be underestimated and addresses the students’ perceptions of being ‘alone’ when learning the traditional, non-simulation based curriculum at the University of Portsmouth. This community requires both nurturing and guiding. However, time consuming, may result in elevated student satisfaction, lower attrition and accelerated learning by encouraging a group ethos to learning and realisation that each individual is not alone in their learning needs.

It is anticipated that the proposed conceptual framework could inform future ODP integrating simulation-based learning. Whilst not prescriptive, the findings can provide a guide of aspects for consideration and preparation prior to teaching. It is recognised that this conceptual framework requires further research, it is the starting point for educators of ODPs who use simulation-based learning.
The learning and teaching needs of students and staff were analysed and incorporated into the revised conceptual framework, based upon reflective discussions regarding simulated learning activities for this ODP professional group; adaptations required for the continued use of the revised curriculum at the University of Portsmouth (and the studies that report on these) are:

- Removing the barriers and encouraging enablers of ODP learning (Study One)
- Structured and unstructured learning opportunities in simulation (Study Two)
- Methods of encouraging peer learning and unlearning poor practice (Study Two)
- Creation of a supportive and equal learning environment (Study Three)
- Facilitation of revision sessions and targeted learning for students with specific learning needs (Study Three)
- Identification of transference and ability of students on clinical placement (Study Four, triangulated in Study Five)
- Evaluation and revision of the revised curriculum (Study Four, triangulated in Study Five)
- Preparation for transference of learning into placement application (Study Four, triangulated in Study Five)
- Teacher preparation of the new curriculum (including clinical educators) (Study Five)
- Clarity of teaching and feedback mechanisms to students and clinical educators (Study Five)
It is anticipated that future teaching management of ODPs shall be conducted using the revised conceptual framework above as a guide for the preparation of students, academic staff and clinical educators, ensuring transparency, realistic expectations, quality and sustainability. The addition of staff and clinical educator preparation shall respond to the clinical educators’ need to know exactly what is taught at the HEI with frequent updating of all staff that teach ODPs.

In addition, clarity of what is being taught, by whom and how, should reduce the incidence of unrealistic hopes of what students expect in the clinical placement as well as on clinical educators who were unaware of what the student has already been taught and assessed on prior to attending placement. The theoretical constraints of behaviourism, cognitivism, constructivism and social learning have been mitigated by the introduction of the revised curriculum and the introduction of simulated learning at the University of Portsmouth. Application of learning theories in the revised curriculum relates much more to the type of learning and where that learning takes place (HEI / Placement). This ensures a transparent learning process for achieving the curriculum learning outcomes and is evident from the results reported in studies Three to Five.

5.14 Chapter summary

The aim of this chapter was to discuss the findings of three studies that investigated the perceptions and attitudes of student ODPs and clinical educators in relation to the implementation of simulation-based learning into the ODP curriculum at the University of Portsmouth. The data presented from these studies have answered the final research question for this programme of research:
What are the key parameters that determine whether or not simulation-based teaching encourages higher order learning?

This chapter has investigated and presented studies that explore whether simulation-based learning can enhance higher order learning and what makes it effective, from the students’ and clinical educators’ perspective. Key parameters that determine higher order learning included: preparing the students prior to clinical placement by employing a longer study block; encouraging social learning and teamwork; and developing the students’ knowledge and confidence; all of which were developed using simulation-based learning and reportedly transferred into placement learning.

Aspects of students comparing HEI teaching with placement teaching and evaluating the strengths and comparisons of each, as well as enthusiasm in learning and demonstration of professional values were prevalent themes. This was confirmed by the placement educators, and is representative of higher order learning above that which that was expected of students at their stage entering the clinical learning environment.

A negative theme that transpired was the perceived lack of knowledge of the new curriculum by clinical educators and that they felt underprepared. This is an important area to address if the HEI and clinical placement are to work together in a joined up method because failure to capitalise on the students’ knowledge and skills to date may result in missed time and learning opportunities.

The results presented in this Chapter facilitated the development of a conceptual framework for using simulation-based teaching and learning for ODP students.
Chapter Six

Discussion of this programme of research
6.1 Introduction to the discussion

This chapter begins with a summary of the background to this programme of research and the specific aim it set out to achieve. It places the aims and the research questions at the centre of the discussion regarding the investigation of traditional learning and the revision and implementation of a revised curriculum for ODPs at the University of Portsmouth. This chapter discusses the strengths and limitations of this programme of research, and presents the conclusions that can be drawn from the results of the studies in light of these strengths and limitations. Finally, this chapter posits the clinical implications of the findings and suggests directions for future research.

6.2 Summary of this programme of research

6.2.1 Aim and objectives

The aim of this programme of research is to investigate the effectiveness of ‘traditional’ ODP teaching and learning and evaluate a revised curriculum that integrates simulation-based teaching and learning for ODP students. Developing the aim for this programme of research has led to the following research questions:

1. What are the reported enablers and barriers to learning for Operating Department Practice students?

2. What are the key parameters that determine whether or not the teaching method used leads to improved skills and knowledge acquisition?

3. What are the key parameters that determine whether or not simulation-based teaching encourages higher order learning?
The literature review in Chapter 2 of this thesis presented several important challenges to healthcare education, including the use of simulation to teach medical, nursing and allied health professionals. It was argued that the NHS faces significant challenges and changes which affect clinical learning, in particular ODPs (Boularias & Chaib-Draa, 2013) for this research. Staff satisfaction and patient safety relies on a well-educated and motivated workforce that is fit for purpose (Bennett, 2003; Bevan, 2006). Furthermore, the changing needs and desires of patients as well as variations to the type and frequency of illness and surgery are all affecting healthcare education (Pritchard, 2009; Rodger et al., 2008; Temple, 2010).

Placement learning on the other hand, is described in the literature as being often unfair and inequitable because of increasing need for limited placement learning experience and the inability to guarantee access to safe learning opportunities (Brown et al., 2011). Furthermore, challenges such as placement learning are becoming potentially unsustainable in a safe and effective manner due to staff shortages and patient ‘availability’. Compounding these issues is competition for clinical experience from the range of professions that require their students to learn in a contextual environment such as operating theatres (McAllister, 2005; Smith et al., 2010).

Simulation is reported in the literature as being a potentially useful and rigorous method of learning, by offering the opportunities of an objective, reliable and repeatable learning experience. It also addresses the ethical issues of practising on patients and offering a solution to declining placement learning opportunities (Gisondi et al., 2004; Ste-Marie et al., 2013). Finally, transference of learning was reported as achievable and desirable, as described in the literature (Eraut, 2004b; Magill et al., 2010). These findings are not necessarily transferrable to the
profession of ODPs and none of the studies in the literature had ODPs as participants.

Therefore, the first objective of this programme of research was to investigate the barriers and enablers to learning through a traditional curriculum. This was answered in Study One, reported in Chapter 4, through the analysis of data from second year ODP students who had undertaken a traditional curriculum. The results of Study One reported in Chapter 4 formed the basis for conducting a positivist study and Study Two reported the results of testing the effectiveness of three education methods. This led to re-designing the ODP curriculum at the University of Portsmouth by integrating simulation-based learning, to address the challenges that the NHS faces based upon a nursing conceptual framework and using a curriculum-writing group to quality assure the changes. Studies Three and Four reported in Chapter 5 evaluated the implementation of the revised curriculum on first year ODP students prior to clinical placement and six months into their course. This was followed up by Study Five, reported in Chapter 5, which investigated the perceptions of clinical education managers relating to student performance and their views of the revised curriculum at the University of Portsmouth. The results of which triangulated and confirmed the results of studies Three and Four.
6.3 Main findings and strengths of this programme of research

The main findings from this research are discussed in the order that they are presented in this thesis (see Chapter One, figure 1, p.11 of this thesis). Chapter 4 of this thesis presented the first two studies conducted on participants with no experience of learning using simulation-based activities or pedagogies.

Study One used semi-structured interviews to elicit views and perceptions of learning via a ‘traditional’ ODP curriculum. The data resulted in a comprehensive description of the participants’ views on what enabled and formed barriers to their learning. This credible description and further understanding of the challenges that students face resulted in the need for further investigation and therefore formed the foundations of this programme of research. These findings concur with the study conducted by Papathanasiou et al. (2014), who highlight a noticeable gap between students’ expectations and the reality of learning. Another study by Wordsworth (2014) discusses this further and identifies that the congruence of the habitus of the student and the expectations of the professional field, can be influenced by students prior expectations. Students experiences can result in potential dissonance between divergent learning environments such as the University and the clinical placement area, resulting in, ‘a spectre of the theory-practice gap’ (Wordsworth, 2014, p. 143) which can manifest as a barrier to learning.

The study participants articulate a disconnection between HEI and placement learning, causing distress and confusion in knowing which learning environment to comply with. The alignment of the learning process between placement and the HEI through a joined up curriculum and a process of constructive alignment (Biggs, 1999) was not obvious to students. These aspects of managing placement learning
have been investigated by authors such as Bahn (2001) and Benzie et al. (2005) who identify that these are significant factors for the continual development of the students, which then encourages inclusion of students by other staff members (Lave & Wenger, 1991).

Therefore, this study adds to the evidence base regarding learning in the HEI and on clinical placement for ODPs by answering the first research question, evidence that hitherto, did not exist. This study was the first in the UK to provide in-depth descriptions of the challenges that ODP students face and their experiences of learning in a divergent manner.

The findings from Study One were credible for two particular reasons. Firstly, purposive sampling ensured the recruitment of participants with lived experience of learning via a traditional ODP curriculum. This was crucial in understanding the traditional curriculum through their experience. Secondly, the participants had not been introduced to the simulation facilities at the HEI and so had no pre-conceived ideas of learning in simulated activities as a student ODP.

Study Two used a positivist approach to evaluate three different education methods on first year ODP students. Twenty-seven participants were recruited and randomised into one of three groups: part-task training, traditional teaching and learning; and simulation-based learning, to teach two clinical subjects. Following the teaching, the participants were assessed on their clinical ability by an external examiner using an OSCE format. In addition, all participants undertook pre and post teaching questionnaires to elicit data regarding cognitive baseline and development knowledge of the two test subjects and questions relating to confidence.
The findings from Study Two infer that using simulation provides a submersive environment that provides a real world referent analogy as described by Crookhall et al. (1987); in this case, anaesthetising or resuscitating a patient. It also shows that students improve their knowledge and skills prior to attending a clinical placement, which is not reported in other studies (Aliner, 2007; Bradley & Postlethwaite, 2003b; Clancy et al., 2002), as well as facilitating methods of learning repetition, enhancing confidence and understanding (Corbridge et al., 2008; Greenberg, Loyd, & Wesley, 2002).

The use of random sampling and an external examiner to assess the performance of participants was a strength of this study. It demonstrates transparency in the execution of the study and transparency to the results that the simulation group outperformed the other groups. That said the sample was small and convenient, representative of one cohort of ODP students. Whilst the results are encouraging, the design cannot be representative of the entire ODP profession and therefore the debate in Chapter Three surrounding transferability and generalisability is extant, as Polit and Beck (2010) discuss. One aspect of rigour that is often discounted or misinterpreted by qualitative researchers is that of generalisability of findings.

In-depth qualitative research that reveals and concludes with higher-level concepts, is able to be extrapolated and inferences made to a generalised population (Glaser, 2002; Misco, 2007). Generalisation means to draw inferences from observations and is acknowledged as a quality standard (Polit & Beck, 2010). The studies reported in this thesis, support the notion of generalisation in that they are mixed, thickly described, conceptualised and performed on similar samples (Polit & Beck, 2010).
Chapter Five presented the final three studies that evaluated the implementation of the revised ODP curriculum at the University of Portsmouth integrating simulation-based learning, using focus group interviews (FGIs) with purposive and convenient samples. Studies Three and Four investigated the revised curriculum from the point of view of the ODP learners prior to clinical placement and followed up the same participants six months into their course. There were no losses to follow up or missing data from the FGIs and these offer credible and tangible results in the following ways.

The results of these studies are encouraging in the preparation of students getting ready to learn on placement, realising and confirming their expectations using a systematic and transparent approach. This was a theme that emerged from the data from participants in Study One when they discussed their needs for preparation to learn clinically and the results of Studies Three and Four showed that they have been addressed by the revised curriculum at the University of Portsmouth. In addition, the limitations reported in the literature in relation to the use of different learning theories, and reported in Chapter Two, were mitigated by the participants undertaking teaching that was designed to use the learning theories in a more meaningful way, specifically by the conscious use of learning theories matched to curriculum learning needs and taught using simulation-based techniques.

The findings confirmed the results of other studies in that using simulation is reported to enable a submersive environment that provides a real world referent analogy (Crookhall et al., 1987). It offers a method for students to practice the psychomotor ability they will hone in clinical placement in an attempt to provide sound, evidence-based and holistic care to the patients they encounter whilst also
allowing for exposure to similar clinical experiences and phenomena for all (Aliner, 2007; Bradley & Postlethwaite, 2003a; Clancy et al., 2002).

In addition, the data infers learning through repetition, enhanced confidence and understanding (Corbridge et al., 2008; Greenberg et al., 2002) and this leads to higher order learning through transference of knowledge from one learning environment to another. Crucially, applying simulation-based learning rather than apprenticeship relying solely on patients and opportunity, has become evident in making this transformation happen.

Previous research of different professional groups such as nurses, anaesthetists and surgeons identified that simulation techniques afford a level of confidence and ability for participants (Aggarwal et al., 2004; Aliner, 2007; Clapper & Kardong-Edgren, 2012; Corbridge et al., 2008; Domuracki et al., 2009; Kneebone, Scott, Darzi, & Horrocks, 2004; Rauen, 2004; Szpak & Kameg, 2013). However, whilst these studies focus on medical and nursing professions; none have investigated formal curriculum change, addressed the limitations of learning theories or included the profession of ODPs.

Therefore, this paucity of available evidence highlights the importance of the research reported in this thesis. There have not been any other studies conducted or replicated across cohorts with an ODP professional group using such pedagogic techniques.

Finally, Study Five reported in Chapter 5 was designed as a FGI with 12 clinical education managers were representative of the geographical region, supporting placement learning for ODP students. One strength of Study Five is that the results demonstrate triangulation of the perceptions of the students detailed in Studies
Three and Four. The clinical educators confirmed the abilities of the students in aspects of knowledge and performance and that these aspects have transferred from learning through the revised curriculum at the University of Portsmouth. Students exhibited increased knowledge, confidence and skill from the beginning of the placement learning experience; this confirms higher order learning for this participant group. In addition, the revised curriculum alleviated some of the pressures of the education managers in terms of placement allocation and this is regarded as a useful outcome. The process of practical assessment of competence of the students has been identified as being successful at first attempt with no discernible deficit of learning by revising the curriculum (Dieckmann, Gaba, & Rall, 2007; Eraut, 2004a, 2004b; Gergen, 1995).

6.3.1 A conceptual framework for simulation-based ODP education

The main concentration of this programme has been the investigation of a traditional ODP curriculum followed by the implementation and evaluation of a revised ODP curriculum, integrating simulation-based learning at the University of Portsmouth. One tangible result from the results described in Chapters 4 and 5 has been the development of a conceptual framework to inform future delivery of the revised curriculum at the University of Portsmouth. Initial changes made to the traditional ODP curriculum were based upon a nursing conceptual framework devised by Jeffries (2005).

The results of this programme of research led to devising a conceptual framework that specifically addresses the needs of ODP learners in simulation-based education as well as the needs of clinical educators. Critics of the Jeffries conceptual framework identify that it focuses on the design of simulation-based learning around
the participant and does not encompass a wider perspective (Wilson & Klein, 2012) and these issues informed the development of the ODP simulation conceptual framework.

The conceptual framework presented in Chapter 5 of this thesis consists of four components that aim to encompass the aspects for consideration when developing simulation-based learning for this ODP professional group, including: Student; Simulation; Educational practices and Teacher. Within each of these areas were sub themes for consideration by curriculum designers or lecturers that specifically seek to address the barriers to learning reported by ODPs in simulation-based learning and by following the previous ‘traditional’ curriculum and is the first conceptual framework of this type for ODPs. Therefore, whilst it is a useful tool to inform the development of simulation-based learning, it can only be measured against the Jeffries model, which has limitations as already discussed. However, the conceptual framework for ODPs does need further evaluation and requires developing or adapting to suit particular HEIs.

6.4 Limitations of the research presented in this thesis

The findings discussed above must be set within the methodological implications within the Five Studies reported. Principally, these relate to mixed methods research, the qualitative methodology used, sample sizes and the sampling method. Although these methodological compromises do not necessarily undermine the results of the studies, nor affect the changes made to the ODP curriculum at the University of Portsmouth, interpretation and generalisability across other HEIs that teach ODPs or other allied health professions, should be done cautiously.
6.4.1 Methodological criticisms

The purpose of using mixed methods research was to use the qualitative data from Study One to inform the design of Study Two. In that respect, and notwithstanding the cautions and criticisms of mixed methods research described above, it was a successful approach to take for this programme of research because it facilitated a deeper understanding of participants’ views and perceptions, through the triangulation of studies and the subsequent saturation of themes. Furthermore, each study informed the direction of the next and formed a solid foundation based on evidence to support informed data collection.

Similarly, there are criticisms of phenomenography both theoretically and methodologically. Theoretical criticism revolves around two themes: firstly that the researcher can report alterations in themes based upon participant interpretation of the research question (Saljo, 1996), and that the participants’ voices can be “lost” by the development and representation of the data by the researcher (Bowden et al., 1992). However, phenomenographic research seeks to explore meaning from a group of individuals and therefore variations in interpretation form part of the basis upon which the research is conducted.

6.4.2 Reliability

Reliability is one of the main characteristics that any researcher must consider when making judgements upon the quality of data used within a study. Within a positivist paradigm, data is generally quantified and therefore relatively easy to manage and can be used to derive estimates of reliability (Pedhazur & Schmelkin, 1991). Within the positivist paradigm, response variance on variables of interest is the most
common of analyses. Reliability coefficients were used to test these variances and then depending upon the results (high or low variance), the researcher can place confidence in the analysis (Cronbach, 1951; Cronbach, Gleser, Nanda, & Rajaratnam, 1972). The positivist results reported in Study Two violated the assumption of homogeneity of variance and a Welch F test was performed. However, the sample size was small and so the test would benefit from being repeated on a larger scale. The same limitation is true for the confidence / cognitive score of participants and would benefit from a repeat study on a larger scale.

Within the interpretivist paradigm, the consistency of the evidence or data collected is as trustworthy, credible and valid as a positivist paradigm (Lincoln & Guba, 1995). Qualitative interviews can be more challenging to ensure validity and reliability because feelings and perceptions may have been open to interpretation and the fact that the interviewer may have a particular bias that can influence findings and results as discussed above (Carter & Porter, 2000). These issues were mitigated through the reflexive approach and positionality of the researcher as well as recognising the potential for bias and confirming the data analysis with other researchers to ensure the dependability of the analysis presented in this thesis. An audit trail of decision-making has also provided trustworthiness.

Nonetheless, maintenance of reliability and validity was achieved by designing research instruments that guided responses when used in similar ways and conditions (Pope & Mays, 2000). Meadows (2010) states that this approach:

“Enhances the reliability and validity of the interpreted findings. Validity is about how sure we are in measuring what we think we are measuring, while reliability is how reliable are our findings”.

(p.374)
Lincoln and Guba (1995) pose four standards that should be used when judging qualitative studies; these are:

- Credibility
- Transferability
- Confirmability
- Consistency (dependability)

Credibility and transferability are qualitative terms used to refer to methodological validity for qualitative research or objective and generalisable for quantitative research. Whilst there are criticisms of mixed methods research (QUALITATIVE and quantitative) the types of data that were elicited from the studies presented in this thesis, each informed the next. Furthermore, the debate surrounding issues of transferability have been discussed and rationalise in Chapter Three and detailed further later in this chapter. Consistency equates to reliability and confirmability (Lincoln & Guba, 1995). In order to explore such measures of reliability and validity for this programme of research, it is important to understand the measures used to explore and maintain the four standards.

A phenomenographic qualitative approach to data collection and analysis seeks to explore the range of meanings from within a selected sample, in this case ODPs and not the range of meanings from individuals within the group per se. Therefore the collection and analysis of conceptions and development of themes and the understanding thereafter is collective of the sample rather than individual understanding. The voice of the participants who took part in this research is evident throughout, represented by the vignettes presented in each qualitative study, verbatim quotes and triangulated between cohorts and by the observations and
perceptions reported of the clinical educators in the final study. This voice is then confirmed through the processes of participant validation ensuring that the interpretation of meaning from the participants’ words was true, representative and accurate.

Consistency of the data management was maintained through the application of several measures such as purposive sampling and by the utilisation of interview schedules to guide discussions and provided structure to the interview (Meadows, 2003) allowing for transparency whilst being flexible to be able to capture the interviewee’s story.

This is also known as strategic replication, and this in turn can enhance transferability of findings (Polit & Beck, 2010); this facilitated reproducibility (if that is possible) with qualitative research (Parahoo, 1997). Previous studies have not always identified reproducible results. This is due to human nature and the fact that human response is likely to change with environment, time, circumstances and setting (Greenhalgh & Taylor, 1997). Purposeful sampling ensured recruitment of participants who had experienced learning using a traditional curriculum and so could provide rich data that would answer research question one. Indeed, analysis of the themes showed data saturation with participants converging on similar learning experiences and barriers to learning, viewed from their individual perspective but reported as a group. Furthermore, following an explored method of data analysis and applying the same techniques and methods to each study ensured consistency of data management and a transparent way of demonstrating the development of themes resulting from the data.
Whilst data saturation was reached for the qualitative studies presented in this thesis, the themes of the learning phenomena may not be directly transferrable to all health and social care students. Likewise, it could not transfer to HEIs that do not have the physical simulation resources or the pedagogic desire or ability to redesign their curricula in the way used for this research.

Limitations include the populations being sampled from a single cohort, so the findings are not transferrable and generalisable between other learners or even other sites that utilise simulation as a teaching method. There have not been any other studies with student ODPs using such techniques, so these studies do offer an important contribution to professional and educational knowledge. Further research to explore consistency across the different types of health and social care students and additional studies eliciting data from second year cohorts following the same methodological process would enhance and further develop the philosophical and operational design of employing the revised curriculum.

6.5 Conclusion

6.5.1 Contribution to learning theory and existing knowledge

The five studies that make up this programme of research resulted in a pragmatic and effective change to the ODP curriculum at the University of Portsmouth. This included the re-design of teaching and learning methods, to include simulation-based learning, and then developing a conceptual framework to inform the changes. Changes were based on evidence from Studies One and Two and were successfully evaluated in Studies Three, Four and Five. Unique and original contributions of this research include:
• Researching ODPs using a mixed methods approach to triangulate and offset findings from individual studies
• Developing and instigating curriculum change in an evidence-based way
• Investigating the effectiveness of simulation-based learning for this ODP professional group
• Triangulation of study results between the clinical educators’ and students’ learning through the revised curriculum
• Developing and piloting a conceptual framework to inform future teaching of ODPs, integrating simulation-based learning
• Adding to known theoretical and practical knowledge by filling a gap in the evidence base for ODPs
• Facilitating research based writing of the simulation chapter: BSc (Hons) Operating Department Practice, College of Operating Department Practitioners (2013)

The research aim and questions had not previously been asked of this ODP professional group, and therefore this research is unique in filling a gap in the existing knowledge base for simulation-based learning. Based upon the results reported in this thesis, the traditional ODP curriculum was revised addressing the limitations of extant learning theories and the increasing demands and challenges that the NHS faces in developing this workforce.

There were several changes and adaptations required to the revised curriculum, in order to make simulation-based learning a sustainable approach to teaching ODPs.
These included: clearer application of the theories that inform ODP education, staff development, and alterations to equipment and resource management.

6.5.2 Contribution to practice

Findings from this thesis show that by managing the learning process for these students, integrating simulation-based learning into a traditional curriculum has been advantageous in areas of knowledge and skill acquisition, preparation for placement learning, developing a community of peer learning and transference of that learning into clinical placement. Key contributions to practice include:

- Developing student ODPs in a more effective manner than following a traditional curriculum
- Increased effectiveness in preparing student ODPs at the University of Portsmouth for placement learning by mitigating barriers to learning processes
- Better support for clinical education managers by using simulation-based learning to close the theory-practice gap and alleviate placement allocation pressures for students at the University of Portsmouth
- Supporting students and placement educators to realise the needs of the ODP professional curriculum whilst adhering and responding to challenges such as the EWTD
- Providing a more robust education experience between the HEI and placement that supports the ethical interaction between students and patients at the University of Portsmouth
• Reducing the wholesale need for students to wait for opportunistic learning on potentially vulnerable patients and therefore providing a better care service.

Advantages such as enhancement of patient care through the reduction in opportunistic learning, safety of students and staff and the perioperative management experience have resulted from the data of the studies that inform this programme of research. These may be transferrable to other similar professions such as radiography, social work, paramedic science, psychology and nursing.

In addition, simulation in teamwork and multi-disciplinary working should be investigated further to explore the effectiveness in undergraduate and postgraduate education. Addressing the challenges that the NHS face such as limitations of placement and the EWTD are mitigated where activities that are seldom experienced on clinical placement, or the requirement to re-assess a student due to experiential failure happens.

6.5.3 Future research

There exists the need to conduct a comparison study of different methods of teaching and learning between HEIs that use the same placement learning facility, which could triangulate specific strengths and weaknesses of each. This would inform future development of the conceptual framework presented in this thesis in line with the evolving scope of practice for the ODP profession; the needs of the students and patients; meeting the challenges faced by clinical educators and the wider healthcare workforce.
Placement educators may require further development in recognising the needs of the students and the revised curriculum at the University of Portsmouth, and this requires further research and further support structures introduced if needed. Researching curriculum changes and additions of simulated learning on larger cohorts and different professions would elicit data to support or refute the formal inclusion and validation of this type of learning as a central tenet to the respective programmes of study.

Finally, if these results are replicable across future cohorts of ODP students, then it would address the reported challenges to healthcare education. It would be desirable to conduct a mixed methodological study to investigate this model of education and the conceptual framework further; in addition, measures such as how quickly students could progress through the curriculum and how deep their knowledge is could be added.

Healthcare education is facing significant issues and challenges in terms of sustainability and inequity. Practicing on patients often means that care is secondary to opportunistic learning, and the constraints of curricula mean that exposure to safe and appropriate learning is often difficult.

This research is distinctive in that it has investigated the enablers and barriers to learning from the perspective of ODP students living that experience. It has illuminated areas of perceived inequality in placement learning for ODPs cognisant with the reported challenges that the NHS face. Challenges included the increasing difficulties in providing safe, experiential learning that is effective and equitable, which is reflected in the wider literature for professions other than ODPs. In addition, this research has compared ODPs with other professionals such as nurses,
anaesthetists and surgeons reported in the literature in aspects of performance and self-efficacy, comparing popular education methods. This informed changes to the traditional ODP curriculum at the University of Portsmouth, the evaluation of which, has been validated, confirmed and triangulated by the perceptions of new student ODP cohorts and clinical educators.

This research has made a contribution to knowledge in respect of curriculum design and the use of new pedagogies in education, specifically simulation-based learning, compared to the current (and historical) method of Higher Education Institution (HEI) placement learning for ODPs. Issues surrounding the extant learning theories that inform the education experience for ODPs were discussed and the challenges to learning by using a traditional curriculum with theories such as, behaviourism, cognitivism, constructivism and social learning were explored.

Notwithstanding the methodological caveats, this research demonstrates that whilst these are positive outcomes from the participants’ perspective, the implementation of the revised curriculum was not without challenges such as: lack of preparation for simulated learning and assessment by academic staff; constraints of time due to student numbers and equipment availability; insufficient time allowed for students with specific learning needs; equipment failures and equality of feedback to students by staff. Yet new insight into why and how simulated learning has impacted on these participants, notably from a ‘self’ or introspective dimension; moral dualism of getting it right and team-working perspectives have all been reported. It is anticipated that these insights shall continue to impact positively upon the care of the patient by ODPs and address the challenges faced by clinical educators and wider NHS organisations.
6.6 Future development of this work

6.6.1 Building on these studies

The purpose of this research was to develop a body of knowledge that hitherto did not exist and the desire would be the continuation of this work. This section contains suggestions for further research and development based upon the results and the experiences of undertaking this research, that other researchers may consider developing further,

Whilst it can be argued that the results of the studies contained in this thesis support simulation-based learning can offer potential advantages over other types of learning for ODP students at the University of Portsmouth, this is really only a beginning for such investigations. It is felt that there are transferrable aspects of this research to other professional curricula, particularly those that share similar divergent methods of teaching such as paramedic, nursing, medical, dentistry and radiography professions.

Therefore, repeating the studies in this thesis on larger populations and across different learning placements and institutions would offer more generalisable results. Educators or researchers may also consider examining their own curricula and identify the specific barriers to learning and theories that influence their student learning. This in turn, should offer insight into how their own curricula could be constructively aligned using the results from the studies presented in this thesis as a foundation for change. This would prevent ‘silo’ curriculum development and help advance this body of knowledge multi-professionally.
6.6.2 Preventing wasted time and resources

Understanding how the students learn and the requirements of professional curricula would lead to a greater understanding of what simulation-based resources are required. As discussed earlier in this thesis simulation equipment is expensive both in cost and human resources and so understanding exactly what outcome is required by the curriculum should prevent wastage. Additionally, involvement of those who teach such students in a clinical environment would help prevent further barriers to learning. One negative aspect of this research was that placement educators were not wholly knowledgeable regarding the revised ODP curriculum at the University of Portsmouth. This meant that some students were managed as per previous cohorts of students and so the knowledge and skills developed by the implementation of the simulation-based curriculum were likely to have not been fully implemented in clinical placement as well as it could have been.

6.6.3 Research design and methodological advisory

The use of a mixed methods approach provided a robust means of researching several different issues of understanding how ODPs learn and the implementation of a revised academic curriculum. Adopting a mixed methods approach is not without its pitfalls, as the combination of methods is arguably incompatible whilst moving from a positivist view to an interpretivist view (May, 2001). Furthermore, the incompatibility of two paradigms is debated and cited as being impossible to merge due to ontological differences that would make merger undesirable (Ostlund et al., 2011). However, Daniel and Onweugbuzie (2002) disagree with this view and as proponents of mixed methods research, suggest that disregarding mixed methods poses a threat to the advancement of science.
Ritchie and Lewis (2005) discuss that in order to successfully combine the two methods there has to be emphasis placed on yielding different types of data that will converge on the research questions and fulfil the aim, as was conducted for this research. Combining these two approaches provided the opportunity to address the questions posed by this programme of research, by ascertaining the perceptions and empirical data of the sample groups from different angles to converge on an understanding. Furthermore, the use of mixed methods in the context of this research was, as Ostlund et al. (2011) debates, an analytical approach that is appropriate for sequential data analysis.

The positivist study reported in Chapter Two was useful appeared to reject the null hypothesis but also to gain insight into the professional application of all three types of learning. This study showed the extent of resources required for each, time taken to teach and assess as well as the results of each. These results were triangulated with data from the pre-post test knowledge and confidence scores that showed how each teaching subject influenced confidence and cognitive abilities.

Such information is extremely useful when reconstructing a curriculum because it helps to identify what different types of assessment could be used depending upon what outcomes are to be assessed, recognising that simulation-based learning is a tool but must be dovetailed professionally by educators with other teaching and assessment methods.

Phenomenography as a qualitative methodology can be quite complex to understand from a researcher point of view and time must be spent in often self-directed reading in order to become familiar with the concepts. Phenomenography is a relatively new methodology and specifically used in education, more recently
medical education and this was one of the drivers for its adoption for the qualitative
studies reported in this thesis.

6.6.4 Contribution to self: a reflection

Completing this research and therefore this programme of study has enabled
considerable personal in various ways and this section discusses some of those
changes. Firstly, finishing this extensive research is the culmination of 14 years of
part-time study. Having no previous formal qualifications from secondary school or
college, I began my career in operating theatres with a NVQ Level 3 at the age of
28. It was at this time that the vocational award was replaced with the Diploma in
Higher Education and, not wishing to be left behind, I studied evenings and
weekends for two years to attain that Diploma. After successful completion, I
continued to complete a BSc (Hons) in perioperative care; a Post Graduate
Certificate in teaching and learning, a Master’s Degree in education and finally
doctoral level training to achieve a PhD. If nothing else it demonstrates commitment!

As the Operating Department Practice profession has developed and changed so
did I, at each stage becoming more informed and able to engage with the
professional body (CODP). I joined the education and standards committee for the
CODP in 2006 and have enjoyed working with colleagues in shaping the profession.
In addition I have worked with, and been a partner for the statutory body (HCPC)
since 2006 and work closely with them as an auditor of the profession. Studying
enabled me to be confident to join and contribute to these collaborations and whilst
my educational journey has been a long process, it has been worth it.

Conducting this programme of study led to three significant personal developments.
The first was being seconded from my role as a Senior Lecturer to the Health
Innovation and Education Cluster (HIEC) in Wessex as the regional Simulation Project Manager. In this role I helped to develop quality mechanisms and non-silo working for all simulation-based education partners in the region. This involved 11 facilities and 11,000 students. I was also recruited as a national simulation development officer for the Higher Education Academy (one of 12) and worked at a national level to develop simulation education strategies. This was a high profile role that was extremely satisfying and is hoped will lead to the Regional Director’s role.

Finally, I was able to use my knowledge and experience to help inform the professional BSc (Hons) curriculum by co-authoring the simulation chapter in the curriculum. This will enable a direction for all education providers to follow when developing their respective curricula at HEIs.

I have also developed as a researcher through this programme of research. Notwithstanding previous qualifications, this PhD was ambitious from the start. It was important to tell a complete story of student practitioners, what challenges they face in learning, how one might pragmatically change pedagogy to help mitigate those challenges and then complete a comprehensive evaluation of those changes.

I have developed from an educator who conducted research into a researcher who informs teaching through contemporaneous evaluations. In particular, recognising my role as a researcher and the nature of positionality and governance whilst conducting the five studies that are contained within this thesis was enlightening. Controlling bias and excitement when analysing data that ‘speaks volumes’ and leading significant curriculum change that supports students of this profession has been extremely rewarding. I intend to continue my career as a researcher and have made a good start in disseminating works that it is hoped will support and encourage others to do the same. Mick Harper, December 2014.
References


grounded theory. In A. Bron & M. Schemmenn (Eds.), *Social Science Theories and Adult Education Research*. Lit Verlag, Munster.


HCPC. (2012). How to complete your CPD profile. London: HCPC.


Kitzinger, J. (1994). The methodology of focus groups: the importance of interaction between research participants. *Sociology of Health, 16*(1), 102-114.


Moosavi, S., Fatemi, S., & Yazdanipour, M. (2013). Attitude of Nursing, Midwifery and Operating Room Students about Effective Factors on Clinical
Education. *Procedia - Social and Behavioral Sciences, 89*(0), 676-681. doi: http://dx.doi.org/10.1016/j.sbspro.2013.08.914


patient simulator: effects on behaviour and attitude. Medical Education(41), 173-180.


Appendix 1: Study One Documentation
1.1 Study One: letter of introduction

Dear Student ODP,

I am undertaking a PhD looking into the knowledge of individual learning and the use of clinical simulation for Student Operating Department Practitioners (sODP’s). It is hoped that this research will inform both students and teachers of new styles of teaching clinical skills. It is vital that I obtain a representative sample group to ensure the validity of the research, which is why I am approaching you to participate.

Line manager and ethical approval have been obtained to conduct this research.

The findings from this project will be used as part of a report for the University of Portsmouth; they will also be presented to academics that teach sODP’s to highlight any interventions that may be required to teach more effectively, in addition there will be wider dissemination of the research findings through selected peer reviewed journals.

Anonymity and confidentiality will be assured throughout the research, and you will have the right to refuse to continue/withdraw consent at any time without consequence. Your participation within this research will involve one digitally recorded interview. This will be conducted during your normal study blocks or during study days, none of your free time will be needed.

I appreciate how busy your work schedule is, but the subject of learning and clinical simulation is becoming more important with patient care at the forefront of your
profession. I believe it is vital that a clear representation is made by current sODP’s. As such you can make a difference!

If you would like to take part in this innovative study please sign the consent form attached and return it to your Course Leader.

Thank you for your time.
1.2 Information and consent form: Study One

Information and Consent Form for the Undertaking of a Recorded Interview

Upon reading and understanding this information and consent form and after having any questions satisfactorily answered I offer this, my informed consent, to be interviewed by the ExPERT Centre (Chief Investigator) for the purpose of non-profit research.

I understand that the research undertaken will explore and describe the knowledge of Student Operating Department Practitioners (sODP’s) towards the perception of individual learning and clinical simulation. I understand any individual or company does not sponsor this research and that it forms part of Doctoral level study for the researcher. In addition I am aware that the Chief Investigator has obtained relevant permission. Upon completion it is hoped that this research will provide guidance and advice for academics teaching ODP’s.

I understand that I will be interviewed once in the ward area of the ExPERT Centre at a time that is both convenient to me and pre-arranged. I will be asked verbal questions about my role as a sODP and my awareness of my learning preference.

I understand and agree to the interview being digitally recorded (both audio and video) and that the content of the recordings and any transcripts will be treated confidentially and within the legal framework of the Data Protection Act 1998 (http://www.doh.gov.uk/dpa98/). The research content will only ever be made available to those individuals that have been cleared to be involved with the research project.
I am aware that no reports or documentation will identify me in the future, and that my privacy and confidentiality are guaranteed. I agree to the interview lasting up to an hour and that the interviewer may have to contact me for any additional information at a later date, as well as to offer me the chance to review my own transcription for accuracy.

I understand that I was selected to participate in this research because I am currently a registered Student Operating Department Practitioner.

These interviews are granted freely with no coercion and I understand that it is voluntary. In addition I understand that I can refuse to answer specific questions and may terminate the interview at any time. I also understand that I may withdraw my consent at any time with no consequence.

I have received no payment for participating in this research.

Finally I understand that the results of this research will be promulgated via a PhD thesis to the University of Portsmouth and any selected peer-reviewed journals, and that the project supervisor may be contacted at any time if in the future I have any questions or concerns about either the study or my rights as a participant. Contact for the project is Professor Lesley-Jane Eales-Reynolds, Phone 02392 84 4450, email L.EalesReynolds@Westminster.ac.uk

________________________________  __________________________________
Date                                      Project supervisor Signature

________________________________
Interviewee Signature

Thank you for taking part in this study.
1.3 Interview schedule: Study One

PhD Semi-structured interview schedule

Aim of the project

1. What are the affordances offered by clinical simulation to students in the allied health professions? Affordance: An action that someone can perform in their environment, that is dependent upon their physical capabilities, their goals, plans, values, beliefs and past experience (shared repertoire)

2. What are the key parameters that determine whether or not part-task training leads to improved skills acquisition? PTT is considered to be any event where the simulation is merely designed to ensure acquisition of a specific practical skill such as cannulation or intubation and is assessed normally by an objective structured clinical examination (OSCE).

3. What are the key parameters that determine whether or not simulation-based learning encourages higher order learning? SBL is any simulation event that is integral to a specific curriculum and is structured to ensure that students have an immersive experience conducive to higher order learning.

Schedule

Explore rapport, settle participants and explain the nature of the interview schedule

-explain that short answers (yes/no) are of little value. Open-ended questions will be used to provide a conversational approach.

-explain the importance of this research and how the participants will help.

- ensure consent has been received. (written consent is held centrally)

Initiate conversation

-set the context; begin with soft discussion surrounding simulation

Students will be asked to take part in semi-structured interviews to elicit comments concerning their previous professional and educational experience in relation to simulation, their perception of how they learn and the role simulation might play and the factors that affect their learning.

This is the initial interview aimed at setting the scene prior to any PTT/SBL. It will be used to elicit a foundation response to the participants collective background.
Question areas: reflective questioning

You mentioned … as something that often happens, what do you feel about that?
What’s it like when … happens?
It sounds like you have thought quite a bit about …
I wonder if you have any ideas about what might be happening in this situation?

- Previous roles prior to ODP course (to explore pre-conceived ideas, beliefs, values)

- How are they coping with new learning (what are the challenges that they have found so far, how are they coping with these)

- What do they think of the simulation environments in the ExPERT Centre (how do the students feel they replicate their clinical environments)

- How would they describe simulation (relate back to the anaphylaxis scenario that they saw)

- What experience do they have of simulation prior to starting the ODP course (how does this differ from the simulation they have experienced so far?)

- How do they think they learn best (why, how could that be afforded in HEI)

- What do they think of using simulation as a method of learning (are they excited to be learning in a state of the art environment)
• What makes learning enjoyable

• How do they make information “stick”

• How do they learn clinically (what is the best way that they can think of to learn? Apprenticeship etc)

• Would simulation benefit their clinical learning

• How/why
Appendix 2: Study Two Documentation
2.1 Study Two: letter of introduction

Dear Student ODP,

I am undertaking a PhD looking into the knowledge of individual learning and the use of clinical simulation for Student Operating Department Practitioners (sODP’s). It is hoped that this research will inform both students and teachers of new styles of teaching clinical skills. It is vital that I obtain a representative sample group to ensure the validity of the research, which is why I am approaching you to participate. I would like to invite you to take part in a study that compares different types of learning. If you agree you shall be randomly placed into a study group and then asked to fill out a questionnaire. You shall then be taught two clinical activities. When this has been completed I would like to ask you to fill out a questionnaire again and see what new skills you may have developed.

Line manager and ethical approval have been obtained to conduct this research.

The findings from this project will be used as part of a report for the University of Portsmouth; they will also be presented to academics that teach sODP’s to highlight any interventions that may be required to teach more effectively, in addition there will be wider dissemination of the research findings through selected peer reviewed journals.

Anonymity and confidentiality will be assured throughout the research, and you will have the right to refuse to continue/withdraw consent at any time without consequence. Your participation within this research will involve one digitally
recorded interview. This will be conducted during your normal study blocks or during study days, none of your free time will be needed.

I appreciate how busy your work schedule is, but the subject of learning and clinical simulation is becoming more important with patient care at the forefront of your profession. I believe it is vital that a clear representation is made by current sODP’s. As such you can make a difference!

If you would like to take part in this innovative study please sign the consent form attached and return it to your Course Leader.

Thank you for your time.
2.2 Information and consent form: Study Two

Information and Consent Form for the Undertaking of a Recorded Interview

Upon reading and understanding this information and consent form and after having any questions satisfactorily answered I offer this, my informed consent, to be interviewed by the ExPERT Centre (Chief Investigator) for the purpose of non-profit research.

I understand that the research undertaken will explore and describe the knowledge of Student Operating Department Practitioners (sODP’s) towards the effectiveness of different teaching methods. I understand any individual or company does not sponsor this research and that it forms part of Doctoral level study for the researcher. In addition I am aware that the Chief Investigator has obtained relevant permission. Upon completion it is hoped that this research will provide guidance and advice for academics teaching ODP’s.

I understand that I will be asked to complete a questionnaire and then undertake learning activities specific to the group that I am randomly placed into at the ExPERT Centre at a time during this study block.

I understand and agree to the learning activities being digitally recorded (both audio and video) and that the content of the recordings and any transcripts will be treated confidentially and within the legal framework of the Data Protection Act 1998 (http://www.doh.gov.uk/dpa98/). The research content will only ever be made available to those individuals that have been cleared to be involved with the research project.
I am aware that no reports or documentation will identify me in the future, and that my privacy and confidentiality are guaranteed. I agree to the interview lasting up to an hour and that the interviewer may have to contact me for any additional information at a later date, as well as to offer me the chance to review my own transcription for accuracy.

I understand that I was selected to participate in this research because I am currently a registered Student Operating Department Practitioner.

These interviews are granted freely with no coercion and I understand that it is voluntary. In addition I understand that I can refuse to answer specific questions and may terminate the interview at any time. I also understand that I may withdraw my consent at any time with no consequence.

I have received no payment for participating in this research.

Finally I understand that the results of this research will be promulgated via a PhD thesis to the University of Portsmouth and any selected peer-reviewed journals, and that the project supervisor may be contacted at any time if in the future I have any questions or concerns about either the study or my rights as a participant. Contact for the project is Professor Lesley-Jane Eales-Reynolds, Phone 02392 84 4450, email L.EalesReynolds@Westminster.ac.uk

________________________          _______________________
Date                          Project supervisor Signature

________________________
Interviewee Signature

Thank you for taking part in this study.
2.3 RSI assessment documentation

<table>
<thead>
<tr>
<th>Student number</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td></td>
</tr>
</tbody>
</table>

Please indicate in the spaces provided the students score for 1 & 2

Please fill in the circle that best matches your evaluation of each of the following statements about the subject of RSI. **SA**, strongly agree; **A**, agree; **N**, neutral; **D**, disagree; **SD**, strongly disagree.

<table>
<thead>
<tr>
<th>Statement</th>
<th>SA</th>
<th>A</th>
<th>N</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>The student communicated well throughout</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>The student remained calm</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>The student displayed good dexterity</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Cricoid was applied at the appropriate time</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Cricoid was removed only when instructed</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>The COETT was inflated and secured effectively</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>
RSI ASSESSMENT CHECKLIST
RSI Assessment checklist

STUDENT NUMBER:

Did the candidate apply universal standards prior to touching the patient or any equipment?

Did the student prepare suction safely?

Did the student check table operation correctly?

Did the student prepare the airway trolley in the following areas:

- Bougie
- COETT with syringe loaded
- Laryngoscope checked
- OPA/NPA checked
- Supraglottic device available

<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>1</th>
<th>0</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proficiently</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td></td>
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<tr>
<td>----------------------------------------------------------------------</td>
<td>-----</td>
<td>-----</td>
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<td></td>
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<tr>
<td>Did the student communicate readiness to the anaesthetist?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did the student check landmarks on the patient?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did the student communicate with the patient appropriately?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did the student apply one handed cricoid pressure safely and appropriately? (Judgement based on start to completion of induction)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did the student only remove cricoid pressure when instructed to do so?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did the student inflate the COETT?</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Did the student appropriately secure the COETT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Score / 30
2.4 Theory test for RSI and ILS assessments

**Theoretical test-RSI & ILS**

What size are Universal connectors?

Select one:
- a. 15-22mm
- b. 17-22mm
- c. 18-25mm
- d. 15-21mm
- e. 16-21mm

In relation to the NMJ match the pairs below.

<table>
<thead>
<tr>
<th>AChE</th>
<th>Choose...</th>
</tr>
</thead>
<tbody>
<tr>
<td>K+</td>
<td>Choose...</td>
</tr>
<tr>
<td>Ca2</td>
<td>Choose...</td>
</tr>
<tr>
<td>Na+</td>
<td>Choose...</td>
</tr>
<tr>
<td>ACh</td>
<td>Choose...</td>
</tr>
</tbody>
</table>

A Mapleson E is also known as an Ayres T-piece.

True or False?

Select one:
- True
- False
A Mapleson E is also known as an Ayres T-piece. True or False?

Select one:
- True
- False

List all of the potential dangers to an operator when using an AED.

Select one or more:
- a. Trip hazard
- b. Self electrocution
- c. Battery failure
- d. Patient recovering
- e. Overriding automatic mode
- f. Arcing
- g. Incorrect joule setting

Once the patient has lost consciousness during an RSI, how many N of pressure should be applied?

Select one:
- a. 10
- b. 15
- c. 25
- d. 30
- e. 20

Sedation/analgesia is not easily converted to deep sedation and loss of consciousness. True or False?

Select one:
- a. False
- b. True
What is tidal volume?

Select one:
- a. The amount of gas expelled during a tidal surge
- b. The volume of gas occupying the lungs at maximum inspiration
- c. The amount of water required to ensure good sailing occurs
- d. The volume of gas remaining in the lungs after expiration
- e. The volume of gas breathed in and out of the lungs

The Waterlow score is a risk assessment tool for ...

Select one:
- a. wound healing
- b. sterilisers/autoclaves
- c. pressure area care
- d. airway patency

When assessing a postoperative patient, signs of hypovolaemia may be indicated by an increased respiratory rate before tachycardia or hypotension occur. True or False?

Select one:
- True
- False

What is the primary drug for the treatment of MH?

Select one:
- a. Ephedrine 30mg
- b. Hydrocortisone 200mg
- c. Adrenaline 500μg
- d. Dantrolene 20mg
- e. Atropine 600μg
To where should cricoid pressure be applied?

Select one:
- a. Thyroid cartilage
- b. Sternal notch
- c. Cricoid cartilage
- d. Cricoid membrane

By what classification are patient breathing circuits identified?

Select one:
- a. Charles
- b. Guedel
- c. Waters
- d. Mapleson
- e. Boyles

Minute volume (-) anatomical dead space with a RR of 14 results in = ________ O2 available for internal respiration

Select one:
- a. 490L
- b. 4900ml
- c. 6L
- d. 2400ml
- e. 5000ml

How many stages are referred to in Guedel’s classic conscious levels?

Select one:
- a. 1
- b. 2
- c. 3
- d. 4
If you notice that the patient returns to sinus rhythm at a rate of 60 bpm, what is your first action?

Select one:
- a. Place in recovery position
- b. Administer adrenaline
- c. Check pulse
- d. Administer atropine

In relation to an RSI the first thing to ensure is ...

Select one:
- a. checking of the operating table
- b. checking of the airway trolley
- c. checking of the anaesthetic machine
- d. good infection control measures

The appropriate rate of compressions when performing BLS is ...

Select one:
- a. 30:2
- b. 100-120/s
- c. 100-120 min
- d. 30-50 min
- e. 10-20/s

Blood in the pleural cavity is known as?

Select one:
- a. Pneumothorax
- b. Haematemesis
- c. Heamothorax
- d. Heamoptysis
- e. Hemianopia
What is the normal tidal volume of an adult male?

Select one:
- a. 2400ml
- b. 200ml
- c. 500ml
- d. 400ml
- e. 900ml

Select the correct Mallampati classification seen in the picture.

Select one:
- a. Class 1
- b. Class 2
- c. Class 3
- d. Class 4

At the start of an RSI (before loss of consciousness) how many N of pressure should be applied?

Select one:
- a. 20
- b. 15
- c. 30
- d. 10
- e. 5
Are AED’s ...

Select one:
- a. Biphasic
- b. Monophasic

The correct ratio and depth of compressions when performing BLS is ...

Select one:
- a. 5-6cm 30:2
- b. 5-6cm 15:2
- c. As far as possible 30:2
- d. 5-6in 15:2
- e. 5-6in 30:2

List the times when cricoid pressure should be removed.

Select one or more:
- a. When the tube is secured
- b. If the patient begins to vomit
- c. When EtCO2 is seen
- d. Only when told to do so by the anaesthetist

Minute volume is ...

Select one:
- a. Vt + anatomical dead space x RR
- b. Vt - anatomical dead space x RR
- c. FRC + Vt x RR
- d. Vt - equipment dead space x RR
- e. SV x HR + Vt
AED stands for?

Select one:
- a. Automated Extant Defibrillator
- b. Automatic Electrocardiograph Defibrillator
- c. Advanced External Defibrillator
- d. Automated External Defibrillator
- e. Advanced Extant Defibrillator

4 possible times that an RSI would be required are:
- Trauma
- Reflux
- Obstetric patients
- Non-fasting

True or False?

Select one:
- True
- False

What is a bougie?

Select one:
- a. A device which is inserted through the vocal chords and the ET tube railroaded over, when visualisation of the chords is difficult
- b. A type of dance originating during the 1970's, and often seen today being performed by men over the age of 40
- c. A device used to adjust the curvature of a tracheal tube to help direct it through the vocal chords
- d. A device to allow the connection of a catheter mount
- e. A device to pre-form the cuff on a laryngeal mask airway
2.4 ILS assessment documentation

Diploma in Higher Education in Operating Department Practice / RODP

Objective Structured Clinical Examination (OSCE)

Immediate Life Support
INTRODUCTION

This Objective Structured Clinical Examination (OSCE) system of assessment will be utilised for part of this ILS assessment. Verbal assessment of knowledge will also be undertaken. OSCE allows for:

- Standardised scenarios to be used for each candidate
- Reproducible results and expectations of students enhancing validity and reliability
- Recording of assessment activity for scrutiny and feedback
- Reduced variation in examiners decisions
- Use of realistic simulated environment and patients
- Standardised marking criteria

This OSCE consists of one station. Station one will take place in the Operating Theatre at the ExPERT Centre. The examination time for the station is detailed below along with student subject guidance for that station.

STATION ONE (10 minutes) basic aspects:

The student will be expected to demonstrate skill and knowledge in the approach and management of a casualty. The Resuscitation Council (UK) guidelines for Immediate Life Support will be used as the assessment standard.
CLINICAL SKILLS CONSENT FORM

The teaching and learning that takes place on this research study involves students to undertake simulation and role-play during academic study blocks.

Students may be expected to act as subjects (models) and be taught using high fidelity simulators. As such each student must agree that:

- I am at present in good health
- I agree that it is my responsibility to read the precautions and understand the risk assessments for each of the practical skills

Any student who has ever had, or currently suffers with:

- Heart disease, chest pain, breathlessness on exertion, high blood pressure or any other cardiovascular disease
- Respiratory disorder including asthma and bronchitis and chest infections
- Anaemia or any other blood disorder
- Diabetes, glandular fever, thyroid disease
- Musculoskeletal injury or disease including back injury, muscle pain or sciatica
- Kidney disease
- Disease of the nervous system including fainting fits, paralysis and epilepsy
- Any type of hernia
- Any other chronic illness or disease

- Or considers that they may be Pregnant

Has an Individual responsibility in conjunction with the precautions and risk assessments of the practical skill to be undertaken must decide if they can or should take part in that practical skill.
If a student feels that they are unable at any given time to undertake a practical skill due to any of the reasons detailed above they must inform either the course leader/unit coordinator or lecturer delivering the session promptly.

Routinely, skills sessions will involve students dressing suitably for the environment in scrub suits and appropriate footwear. If students are attending skills sessions as models it may be necessary for them to remove outer clothing to facilitate diagnostics. This will be conducted ensuring that every effort to respect the individual’s dignity, moral, religious and cultural beliefs are upheld, students may decide not to act as models if they so wish.

If during a practical session, medical diagnostics reveal a medical complaint that was not previously known it will be the student’s responsibility to seek further medical referral to a General Practitioner or other appropriate Health Professional. Confidentiality wherever possible will be maintained. In the event that an adverse condition is identified or at the students request any simulation can be halted immediately. If this falls at the time of assessment, then that assessment will be conducted at a later time.

Each practical session will take place during academic study blocks and are further detailed within unit handbooks and study block timetables. Practical sessions and simulation will be delivered by academic staff deemed suitable to do so by the University of Portsmouth.

Research material will only be made available to appropriate staff with the informed consent of the individual.

If you are unsure as to the correct procedure to follow or require further clarification please seek the guidance of the course leader or other course staff in the first instance.

I agree that, providing anonymity is maintained, any data that is generated for research during my time undertaking practical skills and simulation maybe used in the preparation of coursework and for recognised ethically approved research projects.

I have read and fully understood these terms and understand where to obtain further clarification, should it be necessary. I declare that I am willing to undertake such
teaching and learning on the Diploma of Higher Education Operating Department Practice programme.

I understand that it is my responsibility to inform a member of the ODP course team, University of Portsmouth of any change in my health status that may affect the aforementioned teaching and learning. Inaccurate or incomplete declaration of health status may lead to inappropriate participation in activity.

Signed (Student)_________________________ Date________________

Name (Block Capitals)____________________________

Signed (Course Leader)_________________________ Date________________

Name (Block Capitals)_________________________
NAME:

DATE:

Did the candidate show awareness of own safety?  YES  NO
Did the candidate check response?  YES  NO
Did the candidate summon help?  YES  NO
Did the candidate clear and open the airway?  YES  NO
Did the candidate check for breathing?  YES  NO
Did the candidate send or go for help once cardiac arrest was established and request an AED?  YES  NO
Did the candidate place hands in correct position on chest?  YES  NO
Did the candidate carry out chest compressions correctly?  YES  NO
Did the student use the AED safely and effectively?  YES  NO

Was the candidate able to explain the rationale to support their actions?  YES  NO

Examiner Signature ...........................................

Candidate Pass/Fail
2.5 Self efficacy questionnaire

RSI and ILS Questionnaire

1. Student answering procedures

The researcher will use the information gathered in this questionnaire in order to help improve teaching activities taught within your programme of study. It is strictly anonymous. A ‘third party’ member of support staff will process all completed questionnaires. No results that could compromise the confidentiality of your answers will be disseminated. You are not obliged to complete this questionnaire, but if you do, it will be taken as consent to take part in the study.

Please complete section 2 by shading in the circles that represent the appropriate responses using a BLACK ballpoint pen. Please do not use pencil or felt tip as these cannot be read by the optical reader. If you want to make further comments, please do so in section 3.

Please fill in the circle that best matches your evaluation of each of the following statements about the subject of continuing professional development (CPD). **SA**, strongly agree; **A**, agree; **N**, neutral; **D**, disagree; **SD**, strongly disagree; **NA**, no response/not applicable.

<table>
<thead>
<tr>
<th></th>
<th>SA</th>
<th>A</th>
<th>N</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you feel confident that you could assist with an RSI</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Do you feel confident that you could assist with ILS</td>
<td>O</td>
<td>O</td>
<td>O</td>
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</tr>
<tr>
<td>Do you think the teaching was enough</td>
<td>O</td>
<td>O</td>
<td>O</td>
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<tr>
<td>I feel I have been prepared to undertake ILS</td>
<td>O</td>
<td>O</td>
<td>O</td>
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</tbody>
</table>
I feel I have been prepared to undertake RSI

Thank you for completing this Questionnaire. Please place in the envelope provided and place the completed questionnaire in the returns box that will be placed on the reception desk in the JWW building.
Appendix 3: Study Three Documentation
3.1 Study Three: letter of introduction

Dear Student ODP,

I am undertaking a PhD looking into the knowledge of individual learning and the use of clinical simulation for Student Operating Department Practitioners (sODP’s). It is hoped that this research will inform both students and teachers of new styles of teaching clinical skills. It is vital that I obtain a representative sample group to ensure the validity of the research, which is why I am approaching you to participate.

Line manager and ethical approval have been obtained to conduct this research.

The findings from this project will be used as part of a report for the University of Portsmouth; they will also be presented to academics that teach sODP’s to highlight any interventions that may be required to teach more effectively, in addition there will be wider dissemination of the research findings through selected peer reviewed journals.

Anonymity and confidentiality will be assured throughout the research, and you will have the right to refuse to continue/withdraw consent at any time without consequence. Your participation within this research will involve two digitally recorded interviews, completion of two short questionnaires and participation in clinical simulation. These will be conducted during your normal study blocks or during study days, none of your free time will be needed.
I appreciate how busy your work schedule is, but the subject of learning and clinical simulation is becoming more important with patient care at the forefront of your profession. I believe it is vital that a clear representation is made by current sODP’s. As such you can make a difference!

If you would like to take part in this innovative study please sign the consent form attached and return it to your Course Leader.

Thank you for your time.
3.2 Information and consent form: Study Three

Information and Consent Form for the Undertaking of a Recorded Interview

Upon reading and understanding this information and consent form and after having any questions satisfactorily answered I offer this, my informed consent, to be interviewed by the ExPERT Centre (Chief Investigator) for the purpose of non-profit research.

I understand that the research undertaken will explore and describe the knowledge of Student Operating Department Practitioners (sODP’s) towards the perception of individual learning and clinical simulation. I understand any individual or company does not sponsor this research and that it forms part of Doctoral level study for the researcher. In addition I am aware that the Chief Investigator has obtained relevant permission. Upon completion it is hoped that this research will provide guidance and advice for academics teaching ODP’s.

I understand that I will be interviewed twice in the ward area of the ExPERT Centre at a time that is both convenient to me and pre-arranged. I will be asked verbal questions about my role as a sODP and my awareness of my learning preference.

I understand and agree to the interview being digitally recorded (both audio and video) and that the content of the recordings and any transcripts will be treated confidentially and within the legal framework of the Data Protection Act 1998 (http://www.doh.gov.uk/dpa98/). The research content will only ever be made available to those individuals that have been cleared to be involved with the research project.

I am aware that no reports or documentation will identify me in the future, and that my privacy and confidentiality are guaranteed. I agree to the interview lasting up to
an hour and that the interviewer may have to contact me for any additional information at a later date, as well as to offer me the chance to review my own transcription for accuracy.

I understand that I was selected to participate in this research because I am currently a registered Student Operating Department Practitioner.

These interviews are granted freely with no coercion and I understand that it is voluntary. In addition I understand that I can refuse to answer specific questions and may terminate the interview at any time. I also understand that I may withdraw my consent at any time with no consequence.

I have received no payment for participating in this research.

Finally I understand that the results of this research will be promulgated via a PhD thesis to the University of Portsmouth and any selected peer-reviewed journals, and that the project supervisor may be contacted at any time if in the future I have any questions or concerns about either the study or my rights as a participant. Contact for the project is Professor Lesley-Jane Eales-Reynolds, Phone 02392 84 4450, e mail L.EalesReynolds@Westminster.ac.uk

____________________  ____________________
Date                  Project supervisor Signature

_____________________
Interviewee Signature

Thank you for taking part in this study.
3.3 Interview schedule: Study Three

Aim of the project

1. What are the affordances offered by clinical simulation to students in the allied health professions? Affordance: An action that someone can perform in their environment, that is dependent upon their physical capabilities, their goals, plans, values, beliefs and past experience (shared repertoire)

2. What are the key parameters that determine whether or not part-task training leads to improved skills acquisition? PTT is considered to be any event where the simulation is merely designed to ensure acquisition of a specific practical skill such as cannulation or intubation and is assessed normally by an objective structured clinical examination (OSCE).

3. What are the key parameters that determine whether or not simulation-based learning encourages higher order learning? SBL is any simulation event that is integral to a specific curriculum and is structured to ensure that students have an immersive experience conducive to higher order learning.

Schedule

Explore rapport, settle participants and explain the nature of the interview schedule

-explain that short answers (yes/no) are of little value. Open ended questions will be used to provide a conversational approach.

-explain the importance of this research and how the participants will help.

- ensure consent has been received. (written consent is held centrally)

Initiate conversation

-set the context; begin with soft discussion surrounding simulation

Background to this Interview

Students will be asked to take part in focus group interviews to elicit comments concerning their experience of the ODP course to date. In particular the students (RODP10) did not go into placement until January 2011.

Question areas: reflective questioning

You mentioned … as something that often happens, what do you feel about that?
What's it like when … happens?
It sounds like you have thought quite a bit about …
I wonder if you have any ideas about what might be happening in this situation?
• What were their perceptions on how they would be taught during Semester 1

• How are they coping with new learning (what are the challenges that they have found so far, how are they coping with these)

• What do they think of the simulation environments in the ExPERT Centre

• How would they describe simulation in comparison to other methods of T&L

• What experience do they have of simulation prior to starting the ODP course (how does this differ from the simulation they have experienced so far?)

• How do they think they learn best

• What do they think of using simulation as a method of learning (are they excited to be learning in a state of the art environment)

• What makes learning enjoyable

• How do they learn clinically (what is the best way that they can think of to learn? Apprenticeship etc)

• How were the OSCEs? Were they surprised at knowledge and skill acquisition?
• If yes why? If no why? And how?

• Do they feel that they are prepared (practically and theoretically) to undertake their first placement?

• Yes/no, why?
Appendix 4: Study Four Documentation
Dear Student ODP.

I am undertaking follow up interviews looking into the knowledge of individual learning and the use of clinical simulation for Student Operating Department Practitioners (sODP’s). It is hoped that this research will inform both students and teachers of new styles of teaching clinical skills. It is vital that I obtain a representative sample group to ensure the validity of the research, which is why I am approaching you to participate, I hope that you shall take part in these follow up interviews.

Line manager and ethical approval have been obtained to conduct this research.

The findings from this project will be used as part of a report for the University of Portsmouth; they will also be presented to academics that teach sODP’s to highlight any interventions that may be required to teach more effectively, in addition there will be wider dissemination of the research findings through selected peer reviewed journals.

Anonymity and confidentiality will be assured throughout the research, and you will have the right to refuse to continue/withdraw consent at any time without consequence. Your participation within this research will involve two digitally recorded interviews, completion of two short questionnaires and participation in clinical simulation. These will be conducted during your normal study blocks or during study days, none of your free time will be needed.
I appreciate how busy your work schedule is, but the subject of learning and clinical simulation is becoming more important with patient care at the forefront of your profession. I believe it is vital that a clear representation is made by current sODP’s. As such you can make a difference!

If you would like to take part in this innovative study please sign the consent form attached and return it to your Course Leader.

Thank you for your time.
Information and Consent Form for the Undertaking of a Recorded Interview

Upon reading and understanding this information and consent form and after having any questions satisfactorily answered I offer this, my informed consent, to be interviewed at the ExPERT Centre for the purpose of non-profit research.

I understand that the research undertaken will explore and describe the knowledge of Student Operating Department Practitioners (sODP’s) towards the perception of individual learning and clinical simulation. I understand any individual or company does not sponsor this research and that it forms part of Doctoral level study for the researcher. In addition I am aware that the Chief Investigator has obtained relevant permission. Upon completion it is hoped that this research will provide guidance and advice for academics teaching ODP’s.

I understand that this is a follow up interview after six months on the ODP course and shall be conducted in the ward area of the ExPERT Centre at a time that is both convenient to me and pre-arranged. I will be asked verbal questions about my role as a sODP and my awareness of my learning on the course so far.

I understand and agree to the interview being digitally recorded (both audio and video) and that the content of the recordings and any transcripts will be treated confidentially and within the legal framework of the Data Protection Act 1998 (http://www.doh.gov.uk/dpa98/). The research content will only ever be made available to those individuals that have been cleared to be involved with the research project.
I am aware that no reports or documentation will identify me in the future, and that my privacy and confidentiality are guaranteed. I agree to the interview lasting up to an hour and that the interviewer may have to contact me for any additional information at a later date, as well as to offer me the chance to review my own transcription for accuracy.

I understand that I was selected to participate in this research because I am currently a registered Student Operating Department Practitioner.

These interviews are granted freely with no coercion and I understand that it is voluntary. In addition I understand that I can refuse to answer specific questions and may terminate the interview at any time. I also understand that I may withdraw my consent at any time with no consequence.

I have received no payment for participating in this research.

Finally I understand that the results of this research will be promulgated via a PhD thesis to the University of Portsmouth and any selected peer-reviewed journals, and that the project supervisor may be contacted at any time if in the future I have any questions or concerns about either the study or my rights as a participant. Contact for the project is Professor Lesley-Jane Eales-Reynolds, Phone 02392 84 4450, email L.EalesReynolds@Westminster.ac.uk

____________________  ____________________
Date  Project supervisor Signature

____________________
Interviewee Signature

Thank you for taking part in this study.
4.3 Interview schedule: Study Four

PhD focus group interview schedule _Follow up

Aim of the project

1. What are the affordances offered by clinical simulation to students in the allied health professions? Affordance: An action that someone can perform in their environment, that is dependent upon their physical capabilities, their goals, plans, values, beliefs and past experience (shared repertoire)

2. What are the key parameters that determine whether or not part-task training leads to improved skills acquisition? PTT is considered to be any event where the simulation is merely designed to ensure acquisition of a specific practical skill such as cannulation or intubation and is assessed normally by an objective structured clinical examination (OSCE).

3. What are the key parameters that determine whether or not simulation-based learning encourages higher order learning? SBL is any simulation event that is integral to a specific curriculum and is structured to ensure that students have an immersive experience conducive to higher order learning.

Schedule

Explore rapport, settle participants and explain the nature of the interview schedule

-explain that short answers (yes/no) are of little value. Open ended questions will be used to provide a conversational approach.

-explain the importance of this research and how the participants will help.

- ensure consent has been received. (written consent is held centrally)

Initiate conversation

-set the context; begin with soft discussion surrounding simulation

Background to this Interview

Students will be asked to take part in focus group interviews to elicit comments concerning their experience of the ODP course to date. In particular the students (RODP10) did not go into placement until January 2011.

Question areas: reflective questioning

You mentioned … as something that often happens, what do you feel about that?
What's it like when … happens?
It sounds like you have thought quite a bit about …
I wonder if you have any ideas about what might be happening in this situation?
• How are they coping with new learning (what are the challenges in placement that they have found so far, how are they coping with these)

• What do they think of the simulation environments in the ExPERT Centre preparing them for placement

• How would they describe simulation in comparison to other methods of T&L that they have experienced (mentors etc)

• How do they think they learn best and why?

• What do they think of using simulation as a method of learning in terms of helping (or not) to learn in placement

• What makes learning enjoyable

• How do they learn clinically

• How/why does this compare to their experience to date within the clinical environment?

• Did undertaking the OSCEs afford them with any tangible memory or experience that related to clinical placement?

• So did it help at all?
• Have they noticed differences in their practice (that they were taught at the Uni) compared to others within the clinical environment?

• Do they feel that they have to change their working practices between clinical areas and University?

• If yes why? If no why? And how?

• How could their first study block be improved?
Appendix 5: Study Five Documentation
Dear Colleague.

I am undertaking a PhD investigating the knowledge of individual learning and the use of clinical simulation for Student Operating Department Practitioners (sODP’s) and other healthcare workers. I would like to invite you to take part at the next clinical liaison group meeting, in a focus group interview that shall be focussed on the first year ODP students. It is hoped that this research will inform both students and teachers of new styles of teaching clinical skills. It is vital that I obtain a representative sample group to ensure the validity of the research, which is why I am approaching you to participate.

Line manager and ethical approval have been obtained to conduct this research.

The findings from this project will be used as part of a report for the University of Portsmouth; they will also be presented to academics that teach healthcare workers to highlight any interventions that may be required to teach more effectively, in addition there will be wider dissemination of the research findings through selected peer reviewed journals.

Anonymity and confidentiality will be assured throughout the research, and you will have the right to refuse to continue/withdraw consent at any time without consequence. Your participation within this research will involve one digitally recorded interview. This will be conducted at a time to suit you.

I appreciate how busy your work schedule is, but the subject of learning and clinical simulation is becoming more important with patient care at the forefront of our
professions. I believe it is vital that current service users and key stakeholders make a clear representation. As such you can make a difference!

If you would like to take part in this innovative study please sign the consent form attached and return it to me.

Thank you for your time.

Mick Harper
MA(Ed) PgC LTHE BSc (Hons) Dip (HE) FHEA RODP
PhD Student & Course Leader, University of Portsmouth
Information and Consent Form for the Undertaking of a Recorded Interview

Upon reading and understanding this information and consent form and after having any questions satisfactorily answered I offer this, my informed consent, to be interviewed by the ExPERT Centre (Chief Investigator) for the purpose of non-profit research.

I understand that the research undertaken will explore and describe the knowledge of Student Operating Department Practitioners (sODP’s) within clinical practice. I understand any individual or company does not sponsor this research and that it forms part of Doctoral level study for the researcher. In addition I am aware that the Chief Investigator has obtained relevant permission. Upon completion it is hoped that this research will provide guidance and advice for academics teaching ODP’s.

I understand that I will be interviewed once as part of a focus group in the boardroom of the ExPERT Centre at the next clinical liaison group meeting. I will be asked verbal questions about my role as a Training Manager and my awareness of sODP’s in placement.

I understand and agree to the interview being digitally recorded (both audio and video) and that the content of the recordings and any transcripts will be treated confidentially and within the legal framework of the Data Protection Act 1998 (http://www.doh.gov.uk/dpa98/). The research content will only ever be made available to those individuals that have been cleared to be involved with the research project.
I am aware that no reports or documentation will identify me in the future, and that my privacy and confidentiality are guaranteed. I agree to the interview lasting up to an hour and that the interviewer may have to contact me for any additional information at a later date, as well as to offer me the chance to review my own transcription for accuracy.

I understand that I was selected to participate in this research because I am currently an NHS Training Manager.

These interviews are granted freely with no coercion and I understand that it is voluntary. In addition I understand that I can refuse to answer specific questions and may terminate the interview at any time. I also understand that I may withdraw my consent at any time with no consequence.

I have received no payment for participating in this research.

Finally I understand that the results of this research will be promulgated via a PhD thesis to the University of Portsmouth and any selected peer-reviewed journals, and that the project supervisor may be contacted at any time if in the future I have any questions or concerns about either the study or my rights as a participant. Contact for the project is Professor Lesley-Jane Eales-Reynolds, Phone 02392 84 4450, email L.EalesReynolds@Westminster.ac.uk

Date __________________________ Project supervisor Signature __________________________

Interviewee Signature __________________________
5.3 Interview schedule: Study Five

PhD In depth interview schedule Placement Providers (Data 5)

Aim of the project

1. What are the affordances offered by clinical simulation to students in the allied health professions? Affordance: An action that someone can perform in their environment, that is dependent upon their physical capabilities, their goals, plans, values, beliefs and past experience (shared repertoire).

2. What are the key parameters that determine whether or not part-task training leads to improved skills acquisition? PTT is considered to be any event where the simulation is merely designed to ensure acquisition of a specific practical skill such as cannulation or intubation and is assessed normally by an objective structured clinical examination (OSCE).

3. What are the key parameters that determine whether or not simulation-based learning encourages higher order learning? SBL is any simulation event that is integral to a specific curriculum and is structured to ensure that students have an immersive experience conducive to higher order learning.

Schedule

Explore rapport, settle participants and explain the nature of the interview schedule

-explain that short answers (yes/no) are of little value. Open ended questions will be used to provide a conversational approach.

-explain the importance of this research and how the participants will help.

- ensure consent has been received. (written consent is held centrally)

Initiate conversation

-set the context; begin with soft discussion surrounding simulation

Background to this Interview

Following extensive data collection from student participants for this project it is vital to ascertain the views of clinical partners to see if they reflect a difference between RODP 9 and previous cohorts of students.

Question areas: reflective questioning

You mentioned … as something that often happens, what do you feel about that?
What's it like when … happens?
It sounds like you have thought quite a bit about …
I wonder if you have any ideas about what might be happening in this situation?
• What are their perceptions on how ODPs are taught during Semester 1 (no placement until after xmas)

• How did they feel not receiving students at the beginning of the course?

• What do they think of the simulation environments in the Centre for Simulation in Healthcare

• How would they describe simulation in comparison to other methods of T&L (personal knowledge)

• What experience do they have of simulation in comparison to traditional T&L methods employed clinically

• How do they think the students learn best

• What do they think of using simulation as a method of learning

• What do they think of the professional bodies (AAGBI/CODP/NMC) allowing for simulation in T&L

• Do current ODP cohorts acclimatise quickly to the clinical placement area?
• What are the differences (if any) between UoP ODP students and any others that they come into contact with

• Are they aware of the assessments that year 1 ODP students undertook prior to initial placement

• Did any of this revised course structure facilitate easier placement learning for the student

• Have any of the trainers or mentors made comments in relation to 1st Year ODP knowledge and skill application in comparison to other groups?

• Have they noticed differences in their practice (that they were taught at the Uni) compared to others within the clinical environment?

• If so who’s is better/worse/why?
Appendix 6: Ethics forms
ECREC1: ExPERT CENTRE RESEARCH ETHICS SCREENING FORM

Title of project: Transforming the student experience: Learning through Simulation?

Name of researcher(s): Mick Harper

Name of supervisor (for student research): Professor Lesley-Jane Eales-Reynolds

Date: 20th October 2008

Please provide a brief description of your proposed research (approx. 200 words – attach as additional sheet)

<table>
<thead>
<tr>
<th>SECTION 1: Please answer the following questions by ticking the appropriate box</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will the data be used for purposes other than that for which it was originally obtained? (e.g. will it be shared with anyone else at a later date, used for a separate study?)</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are you in a position of authority or influence over your participants? (e.g. a lecturer, the head of an organisation / society of which the participants are members?)</td>
<td>✓</td>
<td></td>
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<tr>
<td>Are you going to be taking audio or video recordings?</td>
<td>✓</td>
<td></td>
<td></td>
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<tr>
<td>Will your project involve deliberately misleading participants in any way?</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is there any realistic risk of any participants experiencing either physical or psychological distress or discomfort?</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is there any realistic risk to the researcher of either physical or psychological distress or discomfort?</td>
<td>✓</td>
<td></td>
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<tr>
<td>Will the study require the co-operation of a gatekeeper for initial access to the groups or individuals to be recruited? (e.g. students at school, members of self-help groups, residents of a nursing home, incarcerated individuals).</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will the study involve discussion of sensitive topics (e.g. sexual activity, illicit drug use, illegal activity)</td>
<td>✓</td>
<td></td>
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</tbody>
</table>

16 This document has been adapted, with permission, from those used in the Department of Psychology, University of Portsmouth, with grateful thanks.
SECTION 2: Please answer the following questions by ticking the appropriate box

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will you describe the main experimental procedures to participants in advance, so that they are informed about what to expect?</td>
<td>✓</td>
<td></td>
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<tr>
<td>Will you tell participants that their participation is voluntary?</td>
<td>✓</td>
<td></td>
<td></td>
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<tr>
<td>Will you obtain written consent for participation? (Please provide copy of informed consent form)</td>
<td>✓</td>
<td></td>
<td></td>
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<tr>
<td>If the research is observational, will you ask participants for their consent to being observed?</td>
<td>✓</td>
<td></td>
<td></td>
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<tr>
<td>Will you tell the participants that they may withdraw from the research at any time and for any reason?</td>
<td>✓</td>
<td></td>
<td></td>
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<tr>
<td>Will the research take place on University premises?</td>
<td>✓</td>
<td></td>
<td></td>
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<tr>
<td>With questionnaires, will you give participants the option of</td>
<td>✓</td>
<td></td>
<td></td>
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</tbody>
</table>
omitting, or skipping, questions they do not wish to answer?

If you have ticked No to any of the questions in SECTION 2 you should normally submit a full proposal to the Ethics Committee for scrutiny (see FORM B). Discretion and responsibility for this decision lie with the project supervisor. (N.B. for all undergraduate and postgraduate research this form MUST be discussed with, and signed by, your tutor or supervisor).

There is an obligation on the lead researcher / supervisor to bring to the attention of the ExPERT Centre Research Ethics Committee any issues with ethical implications not clearly covered by the above checklist.

IF YOU ARE CONFIDENT THAT THIS PROJECT DOES NOT NEED TO BE REVIEWED BY THE ExPERT Centre ETHICS COMMITTEE THEN PLEASE TICK BELOW.

Please tick

"I consider that this project has no significant ethical implications to be brought before the ExPERT Centre Research Ethics Committee."

Now sign and date the Declaration below, keep a copy of the original form for your records and post the original form in the coursework box (Floor 1, King Henry Building).

DECLARATION

I am familiar with the ExPERT Centre ethical code of practice for teaching and learning research (and have discussed them with the other researchers involved in the project).

Signed………………………………………. Print name……………………………………. Date………….
(UG or PG Researcher(s), if applicable)

Signed………………………………………. Print name……………………………………. Date………….
(Lead Researcher or Supervisor)

(N.B. If you are a student then your supervisor MUST sign this form. It is NOT VALID unless this is completed

If you consider that this project may have ethical implications that should be brought before the ExPERT Centre Research Ethics Committee please submit a proposal for full or expedited review by completing the relevant paperwork (ECREC2) and submit to the Centre’s administrator.
****Please note: signed and submitted on the original****
Researchers at all levels are subject to ethics review.

Ethical considerations serve to identify good, desirable or acceptable conduct in the research process. It involves discussion of what is right or wrong in particular contexts. The School of Health Sciences and Social Work (SHSSW) has a Research Ethics and Peer Review Committee to monitor ethical and peer review of all research, especially those involving human participants and sensitive subjects. Ethics and peer review apply to work at every academic level, including student projects and dissertations as well as doctoral theses and staff research and consultancy. All associated fieldwork is covered so that every (quantitative or qualitative) questionnaire, interview, experimental test, sampling or observation that directly or indirectly involves one or more human participants needs to be reviewed against ethics criteria. Review is also relevant where potentially sensitive issues or physical, biological, cultural or historic features or artefacts are the subjects of research.

All projects should observe the principle of DO NO HARM.

Research projects that involve human participants and sensitive subjects have the potential to do harm, particularly if the participants/subjects are vulnerable. All researchers have a duty of care to the subjects of their research. The care that the researcher needs to exercise also extends to the data processing stage because of the need to ensure that anonymity and confidentiality are protected. It is important for the researcher to provide a reliable assessment of the likely risks and to identify measures to minimize/address any significant risks.

All projects should observe the principle of DO GOOD.

Since, at the very least, participants will be giving up some of their time to take part in research, or sensitive features will be intruded upon it is probable that some small harm, at least, will be caused. It is therefore important that a project has the potential to generate some benefits and that the researcher has been trained in the methods to be used. It is important that the researcher is honest and unbiased in the reporting of the findings.

All research projects involving human participants need to provide an information sheet and consider the need for a consent form.

Further information

More information can be found by visiting the University website to read:

(i) University Ethics Policy at: [http://www.port.ac.uk/accessioninformation/policies/personnel/filetodownload,10430,en.pdf](http://www.port.ac.uk/accessioninformation/policies/personnel/filetodownload,10430,en.pdf) and

(ii) University Research Integrity Circular 28/E7 at: [http://www.port.ac.uk/accessioninformation/policies/research/filetodownload,25248,en.pdf](http://www.port.ac.uk/accessioninformation/policies/research/filetodownload,25248,en.pdf)

(iii) University Data Protection Policy:

General guidance for all data protection issues:

[http://www.port.ac.uk/departments/services/Vice-ChancellorsOffice/DataProtection/](http://www.port.ac.uk/departments/services/Vice-ChancellorsOffice/DataProtection/)


(iv) University Health and Safety Policy: [http://www.port.ac.uk/departments/services/healthandsafetypolicy/](http://www.port.ac.uk/departments/services/healthandsafetypolicy/)

(v) ESRC Research Ethics Framework

[www.esrc.ac.uk/ESRCInfoCentre/Images/ESRC Re Ethics Frame_tcm6-11291.pdf](http://www.esrc.ac.uk/ESRCInfoCentre/Images/ESRC Re Ethics Frame_tcm6-11291.pdf)

(vi) Social Research Association – Ethical Guidelines

[www.the-sra.org.uk/ethical.htm](http://www.the-sra.org.uk/ethical.htm)

(vii) National Research Ethics Service (NRES) – detailed guidance re NHS research


(viii) AHRC Terms and Conditions of Research Council Grants – The AHRC appears to adopt the same principles as the ESRC

[http://www.ahrc.ac.uk/images/l_96899.doc](http://www.ahrc.ac.uk/images/l_96899.doc)
School of Health Sciences and Social Work

All students and staff undertaking a research project, including student projects and dissertations should complete this checklist. It aims to identify possible risks and indicate whether an application for detailed ethics approval needs to be submitted to the SHSSW Research Ethics and Peer Review Committee through the Chair (Associate Head of SHSSW Research and Knowledge Transfer Support Centre).

Before completing this form, please refer to the University code of practice on general ethical standards and any relevant subject specific ethical guidelines.

It is the researcher that is responsible for ensuring the accuracy and completeness of this review. In the case of a project or dissertation, a student can consult their supervisor for guidance, but it is their own responsibility to submit an accurate assessment and adhere to its details.

Questions 1-3:

Answer Questions 1-3 on the Checklist (see later section).

Questions 4-15:

Answer YES/NO to the following questions – insert your answers on the Checklist. If you answer ‘YES’ to any of the questions below, provide a response beneath the italicised guidance or on a separate sheet.

Will the research involve the collection and analysis of primary data? Primary data includes interviews, surveys, self-completion questionnaires, empirical data, etc. that you have collected

If Yes, you will need to consider the ethical issues involved in the collection, use, analysis and storage of data from human informants and non-human subjects, especially if your research requires access to personal, confidential or sensitive data. How will you assure confidentiality? How will you anonymise personal, confidential and sensitive data? Have you gained permission from appropriate data protection officers? Have you made arrangements for the destruction or safekeeping of raw data on completion of the research? Who will have access to, or own, the data? Will you need to ask permission to use stored data for additional research at a later stage? If yes, you need to ask for explicit consent for data storage and data sharing.
Will you be using any data collection instruments?

If Yes, you need to supply details of the data collection instruments (e.g. copy of the interview schedule, survey, questionnaire or empirical test materials). You need to discuss your data collection instrument with your tutor/supervisor. You tutor/supervisor will need to approve it before the data collection exercise begins.

Is the research likely to involve any risk to potential subjects, third parties, you as an individual, or to the University of Portsmouth? Third parties may be teachers, health care professionals, spouses, etc. who are directly involved in the care, education or treatment of the potential subjects.

If Yes, how do you plan to minimize/justify risks? You need to safeguard the well-being and privacy of potential subjects and any third parties. You need to also make sure that you minimize the risks to yourself and anyone else who may be assisting with the data collection. In addition, you need to ensure that your proposed research is not likely to affect adversely the University’s reputation and that no-one will be disadvantaged as a result of your research. Will it be possible to ensure that participating persons/organizations remain completely anonymous? Will you take measures to ensure confidentiality of data collected? Do the benefits outweigh the disadvantages?

Is the study likely to involve observing human subjects, informants or participants? A participant is defined as: (i) a person giving personal and/or behavioural data (ii) a person that is the subject of your research (iii) a person that you plan to experiment upon. It includes those answering structured interviews or questionnaires, but not casual enquiries. It also includes covert observation of people, especially if in a non-public place.

If Yes, confirm whether and explain how you will apply/use (i) recruitment letters (ii) participant information sheets, (iii) informed consent, (iv) maintenance of participant anonymity and (v) maintenance of confidentiality of data collected. You will need to produce and attach the recruitment letter (on headed University paper) and the information sheet for participants (see Appendix). If potential risks are identified, it may be necessary to provide an informed consent form that requires a signature from all the participants (see Appendix).

Will the study involve National Health Service patients or staff?

If Yes, you will need to apply for NHS ethical review. If you answered ‘yes’ to questions 1 and 2, an application must be submitted to the appropriate research ethics committee (NHS REC). David Carpenter, Faculty of Humanities and Social Sciences (david.carpenter@port.ac.uk) is chair of the Isle of Wight, Portsmouth and SE Hants NHS REC and is able to advise you.
Do human participants/subjects take part in studies without their knowledge/consent at the time? Will deception of any sort be involved? (e.g. by covert observation of people, especially if in a non-public place, or by not being clear about the purpose of the research at the outset, etc.)

*If Yes, how do you plan to minimize risks? You will need to provide an extremely strong scientific justification for the use of non-voluntary participation and deception. Will it be possible to ensure the participants remain completely anonymous? Will you take measures to ensure confidentiality of data collected? Will you reveal the purpose of the research after data collection to the participants? Will you ensure the right to withdraw at any time during and after the research?*

Does the study involve vulnerable participants who are unable to give informed consent or in a dependent position (e.g. infants, children, people with learning disabilities, people with special needs, unconscious patients, adolescents, offenders, atypical populations, other people ‘at risk’)

*If Yes, how do you plan to minimize risks? You must safeguard the well-being of your participants by considering any special precautions and procedures that will minimize the risk to these people. e.g. ask for informed consent from their carers or parents, explain whether you will require the co-operation of a “gatekeeper” for initial/continuing access to the groups or individuals to be recruited? (e.g. children/students at school, residents of nursing home, members of a tribe).*

Could the study induce psychological distress or anxiety in participants or third parties?

*If Yes, how will you minimize the risks? You will need to have an informed consent form signed by all participants and third parties.*

Does the study involve face-to-face contact with members of the community?

*If Yes, you must make sure you have procedures in place to reduce the potential risks to you or any other person involved in the data collection. Will you be contacting your subjects directly or will you be gaining access via an intermediary (either an individual or an organization)? Research typically takes place on University premises. Special procedures must be put in place if research is conducted off University premises. Where will the research take place?*
Will financial inducements (other than reasonable expenses and compensation for time) be offered to participants?

If Yes, identify any risks associated. How do you plan to minimize risks and preempt complaints? Will your research incur any financial costs to participants – travel, postage, etc.? How will you inform them of this? If you consider compensation necessary, explain the nature of it and why you think it is needed.

Is there any potential role conflict for you in the research? Potential role conflict arises when your research involves people to whom you owe other duties, e.g. they are your students, clients, patients, employees, etc.

If Yes, how do you plan to minimize/justify risks? You will need to justify the reasons why it is necessary to conduct research with participants to whom you owe other duties. Special procedures are required when the researcher is in a position of authority, power or influence with respect to participants. You will have to show what safeguards (steps) will be taken to minimize inducements, coercion or potential harm, especially for non-participation and how the dual-role relationship and the safeguards will be explained to potential participants.

Will the research involve sensitive issues (topics likely to cause offence to an individual or group, such as sexual activity, death and illness, physical and mental health or condition, religious beliefs, political affiliations, race and ethnicity, criminal records, issues around cultural or gender or other differences, etc.)?

If Yes, how will you ensure a balanced appraisal of the topic and issues involved? You will need to consider reducing potential risks by managing the topics appropriately and by not being subject to undue influences. You will need to discuss any political considerations in taking a critical stand on any sensitive issue with your tutor/supervisor.

If you are in any doubt in respect of your responsibilities and the procedures you need to follow, please contact Rebecca Stores, Rebecca.stores@port.ac.uk for guidance. If the supervisor / assessor of this form is in any doubt about your application they shall refer your application for DETAILED review by the SHSSW Research Ethics and Peer Review Committee.

If you have answered ‘yes’ to any of questions 4 to 15 you must present details of how you plan to minimize any risks identified.
If you have answered 'no' to all questions in questions 4 to 15, it is still your responsibility to follow the University Code of Practice on Ethical Standards and any Department/School or subject specific professional guidelines in the conduct of your study including relevant guidelines regarding health and safety of researchers.

This form constitutes a record of agreed actions that could be subject to review in cases of variation in research procedures and receipt of complaints. It is therefore important to submit an accurate assessment and adhere to or update its details.

All materials submitted will be treated confidentially.
## RESEARCH ETHICS CHECKLIST

<table>
<thead>
<tr>
<th></th>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I have read the relevant section in the Unit Handbook on research ethics (for students only)</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>I am familiar with the relevant subject discipline ethical guidelines</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>I have attended the session on research ethics (for students only)</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>My research will involve the collection of primary data</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>I have supplied details of my data collection instruments (interview schedule, survey, questionnaire, test materials, etc.)</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Could the research potentially be harmful to subjects, third parties, you as an individual, or the University of Portsmouth?</td>
<td></td>
<td>✔️</td>
</tr>
<tr>
<td></td>
<td>Physical</td>
<td>✔️</td>
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<tr>
<td></td>
<td>Psychological/mental/emotional</td>
<td>✔️</td>
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<td></td>
<td>Reputational</td>
<td>✔️</td>
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<tr>
<td></td>
<td>Other social risk (possible stigmatization, loss of status or privacy, risk to community, etc.)</td>
<td>✔️</td>
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<tr>
<td></td>
<td>Compromising situations</td>
<td>✔️</td>
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<td>Material</td>
<td>✔️</td>
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<tr>
<td></td>
<td>Economic (e.g. job security, job loss, etc.)</td>
<td>✔️</td>
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<tr>
<td>7</td>
<td>Is the study likely to involve human subjects, informants or participants?</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Will the study involve NHS patients or staff?</td>
<td></td>
<td>✔️</td>
</tr>
<tr>
<td>9</td>
<td>Do human participants/subjects take part in the study without their</td>
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</table>
knowledge/consent at the time? Will deception of any other form be used?

10. Does the study involve vulnerable or dependent participants e.g. children, learning disabilities?

11. Could the study induce psychological distress or anxiety in participants or third parties?

12. Does the study involve face-to-face contact with members of the community?

13. Will financial inducements other than reasonable expenses be offered to participants?

14. Is there any potential role conflict for you in the research?

15. Will the research involve sensitive issues (topics likely to cause offence to an individual or group)?

If you have answered ‘yes’ to any of questions 6 to 15 you must attach additional details of how you plan to minimize any risks identified. Please see earlier sections for questions you may need to address and suggestions on how to address them.

I confirm that the information provided is a complete and accurate record of my plans at present and that I shall resubmit an amended version of this form should my research alter significantly such that there is any significant variation of ethical risk.

Signed: ………………………………………….. Student or Principal Investigator

Signed: ………………………………………….. Countersignature of Supervisor (if student research)

Date: . . . . . . . . . . . .

ASSESSMENT RECORD (completion by Supervisor or SHSSW Research Ethics & Peer Review Committee)

Favorable opinion - INSIGNIFICANT risk

You can begin to collect your data.

Favorable opinion with provision – see comments listed below

You need to arrange a meeting with your tutor, supervisor or mentor to clarify some issues and solve some problems. Once they are satisfied that you have addressed the issue(s) are addressed, you
are free to begin collecting your data.

Risks assessed as SIGNIFICANT *(undergraduate and taught postgraduate only)*

Referred for DETAILED Ethical Review by SHSSW Research Ethics and Peer Review Committee

Unfavorable opinion – see reasons specified below

Referred back to researcher to clarify/add detail. You must meet with your supervisor, tutor or mentor to discuss the issues and concerns and then resubmit.

No opinion possible – see reasons specified below

Date received: ………………………………………………………………………………………………………………………………

Date reviewed: …………………………………

Signed: ………………………………………... (Supervisor or SHSSW Research Ethics & Peer Review Committee)

Additional Conditions/Comments: