An Exploration of Mentoring Within Ultrasound Clinical Practice.

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

Doctorate of Education

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Abstract

This study aimed to investigate the factors that affect the mentoring of ultrasound students during the clinical element of their postgraduate programme of study. Specific focus was placed on guidelines and support mechanisms that may be shown to be effective in helping colleagues and students in mentoring practice along with considering the factors that may influence the relationship between the mentors and students.

An investigation was undertaken to explore the mentoring and supervision practices in current use. This led to an in-depth study of the attitudes and opinions of students and mentors in relation to mentoring practice.

A mixed methods approach was utilised. Questionnaires were distributed to mentors, and students were invited to attend semi-structured interviews. A thematic approach to analysis gave rise to three main themes: the blurring of role boundaries, a difference in expectations and the importance of the relationship between student and mentor.

An attitude rating score was performed on the student interview data: when compared to the mentor findings, it was surmised that where the student and the mentor showed empathy regarding each other's role and expectations, the student displayed a more positive attitude towards mentoring. Conversely, where the student and the mentor had little empathy, the student displayed a more negative attitude towards mentoring. This identified that there is importance in understanding each other's perspective and expectations, in order to lead to an effective mentoring experience and therefore develop a more positive attitude towards mentoring.

The key concepts that arose were that of the intertwining of support, training and supervision encompassed within the mentoring role. The study findings facilitated development of increased support mechanisms and formative assessment for students, along with updated guidelines and training for mentors.

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Abbreviations / Glossary

AfC	Agenda for Change
CASE	Consortium for the Accreditation of Sonographic Education
CPD	Continued professional development
EdD	Doctorate in Education
HCPC	Health and Care Professions Council
HEI	Higher Education Institution
HHMIRSDU	Health and Human Science, Medical Imaging and Radiation Sciences – Diagnostic Ultrasound
MSc	Master of Science
NHS	National Health Service
NMC	Nursing and Midwifery Council
OSCE	Objective structured clinical examination
PG	Postgraduate
PGCert	Postgraduate Certificate
PGDip	Postgraduate Diploma
RQ1	Research question 1
RQ2	Research question 2
UK	United Kingdom
USA	United States of America

Anonymity

The university in which the research took place has not been directly named. The term 'this University' is used to indicate my workplace. The rationale for this is explained in Section 3.25

All participants were anonymised and referred to by codes as detailed in Chapters 4, 5 & 6.

Chapter 1. Introduction and background

1.1 Introduction

This thesis will present a programme of research through completion of the Doctorate in Education (EdD) programme. The mentoring of an ultrasound student whilst on clinical practice is an important aspect of their training. In order for a student to qualify and work independently as a sonographer, they require ongoing mentoring in a clinical environment with supervision, support and training.

In this first chapter, the background and rationale explain why this study was undertaken. Some of the issues surrounding the ultrasound profession in relation to the training of a student sonographer are presented. A variety of definitions of a mentor are introduced. The aims, objectives and research questions are presented before the chapter concludes by providing a precis of each chapter within this thesis.

1.2 The ultrasound profession

This section is written for the non-expert and it assumes that not all readers have detailed knowledge of radiology and ultrasound training.

Ultrasound is an imaging modality which traditionally is found within the Radiology Department alongside X-ray, Fluoroscopy, Computed Tomography, Nuclear Medicine and Magnetic Resonance Imaging. Ultrasound is one of only two imaging modalities that does not use radiation to produce its images. Imaging studies involving radiation are undertaken by either a radiographer or radiologist. In the United Kingdom (UK), a radiographer is educated to degree level and traditionally performs the examinations; the radiologist then produces a formal report.

Ultrasound uses sound waves that propagate through the body to produce black and white images that are displayed on a monitor. These images are interpreted and a formal report is written which provides one of three outcomes: a diagnosis, a recommendation of further imaging, or a 'normal' finding, requiring no further action. The report writer works autonomously and assumes the medico-legal responsibility for the contents of the report. A patient's treatment, operation or discharge is based on the outcomes of the report, hence the report must be medically accurate to ensure patients are treated correctly. It is custom and practice within the UK that the person performing the ultrasound examination also issues the report. Within the UK, those performing ultrasound examinations who are not radiologists are

known as sonographers. Outside the UK the practice differs. The title 'sonographer' is not commonly used in other countries; those performing ultrasound examinations typically have a lower level of responsibility and autonomy than sonographers within the UK (EFSUMB, 2006). Within the United States of America (USA), Canada, Ireland, Australia and New Zealand the role of sonographer, although given the same name, has a different role in that they work as a practitioner or technician. These sonographers perform the ultrasound examination under delegated authority of a radiologist but they do not write formal reports. Instead, their examinations are passed back to the radiologist who reviews the images and subsequently issues the formal report (ASA, 2009; BabyCentre, 2012). Consequently the title 'sonographer' means different things in different countries. Outside the UK, performing ultrasound is viewed as a technical role with little or no autonomy and responsibility, and additional qualifications are frequently not required. Sonographers trained outside the UK wanting to come and work in the UK, but who have not been trained in the interpretation and reporting of the ultrasound examination, cannot work at the level of a UK sonographer without completing and passing additional training.

Due to the responsibility associated with sonographers, ultrasound education in the UK is undertaken at Masters Level (at time of writing). Applicants are considered for entry onto the postgraduate (PG) ultrasound course at this University based on four criteria as detailed in Table 1.

The entry criteria in point 3 in Table 1 makes mention of registration with the Health and Care Professions Council (HCPC, 2013). Titles such as 'radiographer' and 'physiotherapist' are protected by the HCPC, meaning only those who have been awarded the title professionally may use it; anyone found using the title inappropriately can be prosecuted. 'Sonographer' is currently not a title protected by the HCPC and in the UK there are no requirements for someone performing ultrasound to have any qualifications. The Nursing and Midwifery Council (NMC) maintains a register to preserve the integrity of the profession and ensure patient safety is maintained. All National Health Service (NHS) hospitals in the UK require a sonographer to have a recognised qualification.

Table 1

Criteria for entry onto the PG ultrasound course at this University
1.   Employment in, or access to, an appropriate ultrasound department
2.   Have a mentor for each clinical module being studied
3.   Have an undergraduate degree in a health-related subject or equivalent and be registered with the HCPC in their respective health profession
4.   Would normally work as a sonographer subsequent to qualification

As Table 1 indicates, the opportunity to study ultrasound is open to anyone with an undergraduate degree, thus leading to an intake of students from a range of backgrounds, entering with different levels of medical knowledge and understanding. The skills of a university's lecturers and clinically-based staff need to adapt to ensure that, regardless of a student's background, they all develop the required knowledge, skills and understanding to safely and competently perform and report ultrasound examinations. There continues to be a rise in demand for radiological procedures, with a reported 7% activity increase in 2015/16 (NHS Benchmarking, 2016). To deal with the increased activity, one method has been to redistribute work: this has resulted in some of the traditional roles of the radiologist being delegated to the radiographer or sonographer. The sonographer role remains on the Tier 2 Shortage Occupation List produced by the UK Government (UK Government, 2014) hence clinical departments have high expectations from universities with regard to producing suitably qualified sonographers.

Enrolling on an undergraduate health degree course entails learning a new skill facilitated by both university-based academic lectures and hospital-based clinical practice. Students studying radiography courses select their university of choice, and are then allocated a clinical placement where they spend approximately 50% of their training time. Ultrasound students are also learning a new skill but – in contrast to the radiography training – prior to enrolling on a postgraduate ultrasound course, a student finds a training position in their hospital of choice, and this identifies a university to which they apply. Ultrasound course structures vary: at this University, ultrasound students spend 85% of the time in their hospital undertaking

clinical training. Given this substantial proportion of time spent in clinical practice, learning a skill with high levels of responsibility and autonomy expected upon qualification, the training, support and supervision they require is considerable.

Referring again to Table 1, applicants are required to provide proof that they have a mentor prior to being offered a university place to study ultrasound. A student sonographer always works under the direct supervision of a qualified sonographer to check and verify the student's practice. When the mentor, who is also a sonographer, works with the student they are expected to perform a greater range of duties compared to a supervising sonographer. The level of involvement of the supervising sonographer changes over the duration of the course as the student's competency and confidence increases. At no time during the training is the student left alone with the patient. Following satisfactory completion of the course, and upon qualification, the student works as a qualified sonographer, being expected to work autonomously at the level and speed of an experienced sonographer. They might also be expected to mentor and teach new students. This jump from student in training to qualified sonographer highlights the importance of effective mentoring to prepare students for immediate immersion into the qualified role. During the training of a student sonographer, all supervising sonographers are required to provide regular written feedback. The mentor is responsible for overseeing this feedback and liaising with someone at the university if any competency issues arise. The mentor also conducts formative and summative clinical assessments within the ultrasound department. There is a professional expectation that the mentor is to identify and rectify any concerns with the student's progress. Mentors need to be familiar with university assessment processes and procedures, along with having the confidence to pass or fail a student's clinical assessment as required. The responsibility of a mentor has previously often been underestimated. In order to support mentors in their role, the university provides regular mentor training sessions; the development and review of these inform this study.

Having outlined the role of the ultrasound profession, it is now essential to explain the background for the reasons that prompted the study to take place.

1.3 Background to study

I have been a sonographer for 15 years and have been involved in the training of future professionals for 11 years. Alongside my university role, I maintain my clinical practice as a sonographer on a weekly basis. The area of my work that has always given me the most satisfaction and enjoyment is the teaching and support of students. As a student sonographer I had a difficult relationship with my mentor – but this fuelled my passion for mentoring and its importance within the training programme.

In 2012 I completed a postgraduate diploma (PGDip) through the Credit Accumulation and Transfer Scheme, half of the credits of which came from modules entitled 'leadership through coaching'. By the start of the mentor training in 2012, I had been on the EdD programme for six months. These two courses had enthused me to develop a particular interest in improving mentoring practices.

When I enrolled on the EdD, I knew I wanted to devote my study to investigating an aspect of ultrasound training, as this was my professional background. There had been an ongoing concern over the large numbers of students failing their clinical assessment within the clinical ultrasound modules. Through research and investigation, an understanding of some of the reasons for these failures was anticipated, with a view to implementing changes that would lead to an increase in the pass rates. The historical pass rates for the students' clinical assessments can be seen in Figure 1.1. This study describes the body of research undertaken into mentoring during ultrasound clinical training, which led to widespread curriculum and support changes being introduced – and ultimately this resulted in an improved pass rate.
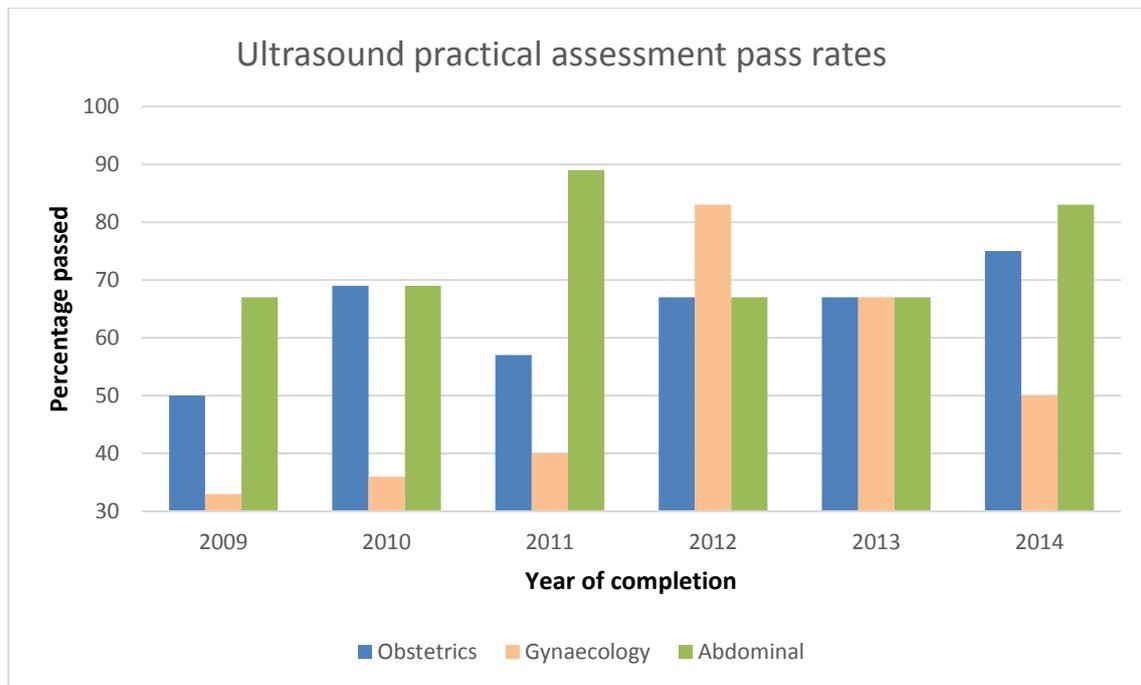
Figure 1.1

There are two anomalies within Figure 1.1 that warrant comment. In 2011 there is shown to be a peak in the pass rate for the abdominal module: this is due to seven out of the ten students registered on the module studying this as their only clinical module, with three already being qualified sonographers in other areas. In 2014 the reduced pass rate in the gynaecology module can be attributed to the cancellation of the induction sessions during the first teaching week. The students did not receive a demonstration of the simulator nor did they get user accounts set up. Therefore they did not make use of this facility.

The first stage in identifying potential reasons for the high failure rate prior to 2015 was to consider all aspects of the ultrasound course. Table 2 displays the various aspects of the ultrasound course and the quality measures already in place. Within clinical departments there does not appear to be the same level of quality control in relation to the student sonographer. This emphasised that the potential reasons for the failure were possibly those external to the university. As previously mentioned, the students were spending 85% of the time within the clinical environment, so it became evident that this element of the course warranted further investigation.

Table 2

Aspects of the staffing and teaching of the ultrasound course at this University		
	Qualification / requirement	Quality control measures
University staff	Teaching qualification Professional qualification as sonographer	Student feedback on teaching Appraisal
University teaching	Defined according to programme learning outcomes Defined hours and content	External examiner Internal monitoring processes Consistent for all students
University-based written assessments	Learning outcomes all assessed to be appropriate and fair	External examiner Internal scrutiny of assessments Blind double marking Threshold pass rates
Clinical staff	Working as sonographer	Internal departmental audit
Clinical teaching	No professional teaching qualification required	None
Clinical assessment	Learning outcomes assessed as appropriate and fair	External examiner Blind double marking

University lecturing staff have no input into the hospitals' selection of their mentors, thus they rely on the clinical departmental managers to select an appropriate member of staff; this selection process for mentors is investigated as part of the pilot study in Chapter 5. The sonographers and mentors involved in training the student sonographer tend to have little or no formal teaching experience and traditionally the university lecturing staff have had limited input and control regarding the training they provide. The primary option for influence and input into the training process is through the provision of mentor training. Updating the

format and content of the mentor training became the basis of this study, as it was felt that this offered one method of developing and improving student training experience and increasing pass rates. Although cause and effect cannot be proven, the delivery of the new mentor training was implemented for those completing in 2015 and 2016, and Figure 1.1 shows the corresponding pass rates for the clinical modules for those years to be 100%. Chapter 7 provides detail of the mentor training and the changes implemented for these cohorts.

As the subject of mentoring developed to become the prominent feature of the research, a study was undertaken in order to be better informed regarding mentoring in clinical practice. This became the exploratory study in Chapter 4. However, at the outset a working definition of mentoring was needed.

1.4 Defining mentoring – a background to the word and practice

The origins of mentoring are ancient and can be traced back in literature over 2,000 years, both within Greek mythology via – for example – *The Odyssey,* the epic poem by Homer, and within the Old Testament. In biblical times mentoring was fundamental, according to Hendricks and Hendricks (1999). They provide many examples from the early books of the Bible, relating the history of the Israelite nation, where a mentoring relationship between two people is the principal approach of passing on skills and wisdom to the next generation. These historic descriptions demonstrate that mentoring is not a new concept. The word mentor has origins in Greek mythology; however there are likely to be differences between mentoring practices and requirements in Ancient Greece or biblical times compared with current practices, and certainly within healthcare. In spite of the ancient traditions, historical definitions of mentoring were not considered wholly relevant today. Table 3 shows a range of definitions of a mentor. Initially the dictionary was sought for a definition; however, it was found that those definitions were limited and did not provide enough detail about what a mentor is.

Table 3

Definition of a mentor	
Source	Definition
Oxford English Dictionary (2017)	An experienced and trusted advisor
Cambridge English Dictionary (2017)	A person who gives a younger or less experienced person help and advice over a period of time, especially at work or school
Collins Dictionary (2017)	A wise or trusted adviser or guide

This lack of detail within the dictionaries instigated searching within the literature for a more comprehensive definition of mentoring. Jacobi (1991) provides 15 definitions of mentoring arising from a review of the literature. While acknowledging that this is a dated article and might not remain current, seven of the 15 definitions could still be applied to mentoring within ultrasound. These alongside other definitions of mentoring are shown in Table 4. Table 4 identifies the varied and multifaceted role of the mentor, and stresses the need for training and supporting mentors in this role to enable them to mentor to their best ability. This variety of definitions of mentoring demonstrate that "even within a given discipline there is often a lack of consensus on a definition of mentoring" (Eby et al., 2007, p. 6). This table demonstrates that following a comprehensive review of the literature, there is no single definition of mentoring that has been universally adopted. A predefined definition of mentoring was not chosen for the purpose of this study, as section 2.17 details.

Table 4

Definitions of a mentor / mentoring which are also applicable to ultrasound	
Source	Definition of a mentor / mentoring
Baranick (2010)	A mentoring relationship serves to exchange emotional support, information and services.
Berks et al. (2005) cited in Cook (2010)	A relationship that may vary along a continuum from informal/short-term to formal/long-term in which faculty with useful experience, knowledge, skills, and/or wisdom offers advice, information, guidance, support, or opportunity to another faculty member or student for that individual's professional development
Black (2004)	A nurturing, complex, long term development process in which a more skilled and experienced person serves as a role model, teacher, sponsor and coach who encourages, councils and befriends a less skilled person for the purpose of promoting the lattes personal and/or professional development.
Blackwell (1989, p. 9) cited in Jacobi (1991)	A process by which persons of superior rank, instruct, counsel, guide and facilitate the career development of persons identified as protégés.
Burke (1984), Kram (1985), Noe (1988), Scandura & Ragins (1993) all cited in Wang et al (2010)	Mentoring refers to a relational process whereby a more experienced individual, usually more senior, contributes to the professional development of a protégé by providing three distinct types of functions: psychosocial support (e.g., counselling, friendship), career-related support (e.g., coaching, sponsorship), and role modelling
Cooper (1999) cited in Cuesta & Bloom (1998)	Mentoring is a dynamic, noncompetitive, nurturing relationship in which an older, more experienced person teaches, guides, advises, sponsors, role models, and befriends a younger, less experienced person
Haggard (2010)	Following a comprehensive literature reviews conclude "We emphasized that we do not believe it is possible, or even desirable, for all researchers to agree on one specific, comprehensive definition of mentoring."

Kirkpatrick (2015)	Mentoring can be seen as a long-term, long-lasting relationship that serves to enhance a protégé's career. Preceptor relationships tend to be more task focused and short lived. Mentoring relationships tend to be more career focused and long-lasting.
Kowtko (2010)	Mentoring gives experienced professionals the opportunity to share their experiences and knowledge with the next generation, developing self-esteem and selfconfidence to achieve goals for career success and advancement.
Kram (1985) cited in Parise and Forret (2008)	Mentoring has been defined as a relationship whereby a more senior, experienced individual is committed to providing developmental assistance and guidance to a less experienced protégé
Levinson (1978, p. 97) cited in Jacobi (1991)	A teacher, adviser, or sponsor.
Meinel et al (2011)	We defined certain basic elements as key constituents of mentoring relationships: (1) Mentoring relationships are personal in nature and involve direct interaction. (2) Mentoring relationships are long-lasting. (3) Mentoring does not merely foster an individual's skills or knowledge, but represents an integrated approach to support the individual mentee's development. This involves emotional and psychological support, direct assistance with career and professional development and role-modeling.
Moore and Amey (1988, p. 45) cited in Jacobi (1991)	A more experienced individual acts as a guide, role model, teacher and patron, aiming to further develop and refine the protégé's skills, abilities and understanding.
Nick et al (2012)	Define mentoring as a one-to-one reciprocal relationship between a more experienced and knowledgeable faculty member (the mentor) and a less experienced one (the protégé). The relationship is characterized by regular/consistent interaction over a period of time to facilitate protégé development
Phillips-Jones (1982, p. 21) cited in Jacobi (1991)	Influential people who significantly help you reach your major life goals.
Sambunjak and Marusic (2009) cited	mentoring is a specific relationship that ''should not be confused with peer support, tutoring, teaching, coaching, supervising,

in Sommer et al (2013)	advising, counselling, sponsoring, role mentoring master's level students 3 modelling or preceptoring
Schmidt and Wolfe (1980, p. 45) cited in Jacobi (1991)	Colleagues and supervisors who actively provide guidance, support, opportunities for the protégé and act as a role model.
Shandley (1989, p. 60) cited in Jacobi (1991)	The wisdom of the mentor is acquired and applied by the protégé through a nurturing, supportive and insightful process that fosters the growth and development.
Zey (1984, p. 7) cited in Jacobi (1991)	A person who oversees the career and development of another person, through teaching, counselling, providing support, protecting.

1.5 Aim and objectives

This study investigated the training for mentoring ultrasound practitioners in order to explore what contributes to becoming a better mentor, as measured by the responses of the mentees and the outcome of their final clinical assessments. A better mentor means one who is more reflective about their own practice and understands the importance of their mentoring role in teaching, training and guiding the student mentee.

Aim

The aim of this research is to explore the mentoring practice and student mentoring experience by an investigation into the factors that affect the mentoring of ultrasound students during the clinical element of their programme of study.

Objectives

- To conduct a review of the literature and background for this study in order to understand the factors involved in the relationship between mentoring and training.

- To conduct an exploratory study to explore the mentoring and supervision practices in current use.

- To undertake a series of studies in order to investigate the attitudes and opinions of students and mentors in relation to mentoring practice.

- To examine the relationship, if any, between pass rates on ultrasound modules and mentoring practice.

- Based on the findings of the above studies, to suggest support mechanisms and guidelines for mentors.

1.6 Research questions

The research questions were developed and refined over the duration of this study. They were informed by my own practice along with the knowledge gained following the literature review at the early stages of this research.

The research questions for this research are:

1. What guidelines and support mechanisms may be shown to be effective in helping colleagues and students in mentoring practice?
2. What factors may influence the relationship between the mentors and mentees?

In Chapter 7 the outcomes of this research will be linked back to these research questions.

The development of the research questions evolved over time following a review of the literature and early stages of the research.

Research question 1: The work that I have done in relation to developing a programme of guidance and support for mentors builds on the solid foundation laid down by colleagues in previous years. This research question has remained since the early stages of the research process began.

Research question 2: The relational element between the mentor and the mentee was considered an important factor (See section 2.17) therefore it was decided appropriate to investigate this area and have a research question related to this. The exploratory, pilot and main studies all considered, to different extents, the relationship between mentor and mentee. This informed two relational themes as identified in Section 6.13. There can be challenges within the mentoring relationship, one of these challenges may be the personal character traits a mentor may or may not possess, which can influence their relationship. A difference in expectations between mentor and mentees may be a consideration which can shape a student's attitude towards mentoring (See section 6.11). Early incarnations of the

research question considered each relational element as a discrete unit. When linking the findings of the exploratory, pilot and main studies back to the research question in Chapter 7, it became evident that there was overlap between the questions. Thus it was decided to have one broad research question considering any factors that may influence the relationship between the mentors and mentees.

There were considerations surrounding how a well support and prepared mentor might have an impact on student pass rates. Although not a specific research question, consideration will be given throughout, where appropriate to any aspects of mentoring practice could have a positive influence on the pass rates of the ultrasound clinical assessment. Historic pass rates for ultrasound clinical assessment did not always meet this University's threshold pass rates as outlined in Section 1.3. It was anticipated that as a result of this research, that there could be a positive influence between mentoring and pass rates. The ultrasound clinical modules, obstetric, gynaecological and abdominal, each have three elements of summative assessment: a written case study, an unseen objective structured clinical assessment (OSCE) along with a practical clinical assessment. As assessments for ultrasound modules are all aligned, and the mentoring required is comparable, each module was not considered separately. It was decided against a specific research question relating to if mentoring practice may have a possible positive influence on pass rates, instead consideration will be given to this where appropriate.

1.7 Overview of project

This chapter has outlined the background and rationale for the thesis. The following chapters present the journey taken to meet these aims. Chapter 2 evaluates the literature relating to mentoring, with a focus on healthcare situations. The title 'mentor' and possible alternatives are considered in detail.

Within Chapter 3, the rationale for the methodological choices is discussed. This thesis adopted a pragmatic, mixed methods approach. The justification for selecting semi-structured interviews and questionnaires is presented.

Chapters 4, 5 and 6 present three individual studies; the methods used for each are explained, followed by presentation of the findings and discussions. Reflections on each study, and how it informed the subsequent study, will be explained. The exploratory study, presented in

Chapter 4, utilised interviews to explore the mentoring and supervision practices of other health programmes within the School of Health and Social Work at this University. The summary of the exploratory study highlighted that the term *mentor* meant different things to different professional groups and different people, so could not be universally applied with the same meaning and understanding. The pilot study, presented in Chapter 5, was designed to test the data collection methods prior to the main study. It was also necessary to test if the type of information gathered through the interviews would be appropriate for the main study in facilitating answering the overall aims of the research. Following the pilot study, some alterations to the data collection methods were made. Chapter 6 describes the main study where qualitative methods, including questionnaires and interviews, were used to gather information from mentors and students. A set of interviews investigated students' ideas and opinions on the mentoring they received whilst studying ultrasound. Questionnaires were sent to mentors to gain an understanding of the mentor's perspective of their role, considering strengths, constraints and relationships. The findings of the main study revealed that there are different expectations between the student and their mentor. These differences can be seen in the overall attitude of the students towards mentoring, in that those who understand the mentors' and students' roles better, and can consider alternative perspectives, may as a result have an overall more positive attitude regarding mentoring than those mentors and students where there was little or no alignment between the student and mentors responses.

Chapter 7 will discuss the overall findings of the study. I will conclude by discussing the contribution to knowledge and practice this study has made. Details of the dissemination of this study are given prior to outlining the plans for future work.

The main finding of this study was the importance of the mentor and the student having an understanding of each other's perspectives regarding expectations of the mentoring relationship. This understanding is developed by mentors and students considering the ideal characteristics of a mentor, along with appreciating the expected tasks undertaken by a mentor. These should be considered from both their own and the opposite perspective. Those students whose perspective had the closest alignment with their mentor displayed a more positive overall attitude towards mentoring. In order to facilitate more aligned expectations and more positive attitudes, changes were made to the overall mentor training and student induction programmes. The changes and the rationale for them are outlined in Chapter 7 as are the expectations these will have a positive impact on future cohorts of students.

I present definitions of mentoring and explain that in relation to ultrasound training within clinical practice, this study has shown that the mentoring role is multifaceted as it also includes training, supervision and support. This is illustrated through the conceptual framework, the stages of development of which are detailed in Section 2.19. A conceptual framework can be a visual representation of the concepts that inform research, and the linkage between concepts permits the reader to more easily understand and remember the content (Miles et al., 2013). As with the well-known saying, 'a picture paints a thousand words', a conceptual framework can present at a glance a summary of the research process.

The next chapter contains the review of literature that was undertaken to inform the development of the studies.

Chapter 2. Literature review

2.1 Introduction

In order to ensure a suitable range of literature was identified, a clear search strategy needed to be designed. Personal experience of reading the usual Radiography and Ultrasound professional journals had found that published work is limited and had a clinical rather than educational focus. There has in fact been very little published work regarding career progression, education or professional practice specific to these professions. The realm of Nursing and Medicine has a wider range of research publications, so articles relating to these and other healthcare professions were included so that appropriate parallels could be drawn.

The training of sonographers outside the UK offers some similarities with UK training, therefore literature published from other countries will be included where relevant. Outside the English speaking world, the role of the sonographer does not exist, as ultrasound examinations are undertaken by doctors. Within the UK, ultrasound examinations may be performed and reported by either a sonographer or a radiologist. Guidance from the Society and College of Radiographers (SCoR) states that: "The ultrasound report should be written and issued by the sonographer undertaking the ultrasound examination" (SCoR, 2016). Reporting practices are different from the UK within other countries. Within the USA, once an ultrasound examination has been performed, an Interpreting Physician views the images and issues a report (AIUM, 2014). Within Australia and New Zealand, the sonographer simply obtains the images, based on which a radiologist compiles the report (ASUM, 2015). Due to this uniqueness in sonographer role within the UK, the mentoring practices in other countries are not directly comparable to the UK. Literature from non-English speaking countries may have limited relevance to this study, so will be carefully considered before inclusion.

2.2 Search strategy

In order to ensure a wide range of literature was identified, a search strategy was designed. As the study developed this was reviewed and refined. New search terms were added to ensure currency and relevancy to align with the research questions and support the data collection strategy. The databases of PubMed, CINAHL® plus, SCOPUS and Google Scholar were utilised. PubMed (2016) is a database with over 22 million articles related to Medicine and health. CINAHL® plus (2016) contains journals from nursing and allied health professions and SCOPUS (2017) claims to be the world's largest database of peer reviewed journals, whereas Google Scholar (2016) allows searches of literature across a wide range of subject areas, which are not necessarily peer reviewed. In addition, searches were performed within specific journals to ensure whether their content was more likely to be valid and reliable, and findings transferable and applicable, to ultrasound education in the UK and specifically at this University. Nevertheless, the literature does include overseas articles from countries that have similar standards and practices to the UK. The relevance of these articles will be considered on individual merit.

Before proceeding further it is considered appropriate to define validity and reliability in terms of their use within research. Numerous definitions have been proposed over the years; however, recent works reference the Hammersley (1987) paper. For a study to be considered valid, its data collection should be precise and accurate:

> Our primary concern in measurement must surely be whether the set of scores we have produced accurately reflects the presence/magnitude of the target property in the objects we have measured. This is what most writers seem to mean by validity. (Hammersley, 1987, p. 77)

In addition to validity, a researcher may aim for reliability in a paper's methodology. Hammersley (1987, p. 78) defines this as "the ability of an instrument consistently to produce valid scores". It is possible for research to be valid without being reliable; however, Hammersley advises striving for both.

2.3 Limits

The year limit was initially set at 2008 to ensure that articles found were relevant and up-to-date. However, in some searches this did not produce many relevant results, so searching from 2000 was also undertaken; these dates chosen were initially rather arbitrary and subsequently had to be altered. Changes to ultrasound education took place in the early 1990s when ultrasound moved from a diploma in medical ultrasound to Masters level university based courses, hence the year limit of 1990 was finally decided upon. It was appropriate to capture developments in ultrasound education since the training transferred to Masters level study.

Initially, free full text articles were selected as it was expected that this would provide access to a suitably wide range of articles. This limit was later removed as the University has reduced the range of journals it subscribes to and can now order any articles upon request, therefore it was deemed necessary to widen the search.

2.4 Keywords

The identification of appropriate key words required refining to ensure any relevant ultrasound articles were found, as well as relevant articles from other healthcare professions. Initially the key words of medical education and health education were used. This returned many thousands of articles covering a wide area of research, but initial reading of the abstract found few to be of direct relevance. Any articles found which were related to ultrasound and teaching new skills were saved for further review.

When searching for professional practice and competence, a wealth of articles were found, but not all were related to healthcare (even though searching in health-related databases). There were a number of articles relevant to developing professional practice in Engineering and Architecture, for example; a selection of these were read but were not found to have any direct relevance or transferability to the ultrasound or healthcare areas of practice.

Ultrasound education returned more results than was initially expected; however upon initial review, many were related to ultrasound training for doctors rather than sonographers.

Professional skills and healthcare were the most useful keywords searched to date, which was unexpected given the limited use of previous similar key words. This highlighted the importance of finding the correct keywords and not to give up if suitable articles are not found initially. A critical appraisal toolkit was used on the relevant articles returned within this

search. When relevant articles were found, their keywords were recorded to use in future searches along with the authors' names to allow the identification of the prominent experts within the field. There were a variety of articles on subjects that related to the ultrasound course, such as portfolio, mentoring, assessment and feedback. This led on to searches using the key phrases found in Table 5.

The keywords identified were inserted with truncation where appropriate; UK and USA spelling and terminology were used to ensure relevant works from overseas were found. Key words were then combined using the Boolean operators NOT, OR and AND.

Table 5

Key words and phrases used within the literature search (presented alphabetically)
Assessment driven
Assessment driven education
Competence
Developing professional practice
Feedback
Feedback radiography
Feedback ultrasound
Health education
Medical education
Mentoring
Mentoring healthcare
Mentoring radiography
Mentoring ultrasound
Portfolios postgraduate
Portfolios radiography
Portfolios ultrasound
Practice based learning
Preceptorship
Professional practice
Professional skills health
Professional training
Student support
Tacit knowledge
Ultrasound education

Table 6 shows the results of the searches undertaken. These results were filtered by relevance and the first few pages of citations reviewed. As this table demonstrates, Google Scholar returned a very large number of results, few of which proved relevant. Where more advanced search functions were available in PubMed, CINAHL® plus and SCOPUS, articles of more relevance were retrieved for full review.

Table 6

Results of database search				
	Database (with limits applied)			
Search	PubMed	CINAHL® plus	SCOPUS	Google Scholar
1 Assessment driven education	440	1504	588	58000
2 Search 1 AND competence	79	1542	111	41300
3 Developing professional practice	2806	35	4310	1410000
4 Feedback AND radiography	763	78	213	22600
5 Feedback AND ultrasound	871	72	421	185000
6 Search 3 AND search 5	24	3801	3	16200
7 Health education AND ultrasound	2086	17	591	144000
8 Medical education AND ultrasound	3875	191	913	166000
9 Mentoring	2200	1489	4416	149000
10 Search 9 AND ultrasound	16	2	23	4200
11 Search 9 AND radiography	13	4	17	1140
12 Search 9 AND healthcare	580	67	429	257000
13 Search 9 AND nursing	555	503	998	30500
14 Portfolios AND postgraduate	21	23	72	15200
15 Portfolios AND radiography	3	7	13	2940
16 Portfolios AND ultrasound	1	1	4	10700

17	Preceptorship	1533	1258	1238	6260
18	Search 17 AND ultrasound	2	0	1	1360
19	Professional practice AND ultrasound	1690	51	240	28100
20	Professional skills AND ultrasound	52	1	41	15900
21	Professional training AND ultrasound	440	5	145	20100
22	Student support	32897	1156	26080	1120000
23	Search 22 AND ultrasound	508	417	84	41000
24	Ultrasound education	9162	54	1696	335000

The literature review considers the perceived benefits of mentoring from a wider perspective before the focus is narrowed to consider literature directly relevant to mentoring within the ultrasound profession and finally literature related to ultrasound practices at this University was also considered.

2.5 Benefits of mentoring

It is found within the literature that having a mentor is a benefit to the student, even though the definitions of mentoring presented differ. Nick et al. (2012) state that the benefit of having a mentor is in the development of a mentee's career and leadership, whereas Kowtko (2010) and Poteat et al. (2009), whilst also stating career development as a benefit, expand this by suggesting that it is personal, academic and professional growth which are developed. They make no mention of leadership practices being developed through mentoring. Meinel et al. (2011) agree with Poteat et al. (2009), Nick et al. (2012) and Kowtko (2010), as they also assert the apparent benefit of mentoring on career development. Stagg et al. (2012) differ in their definition in as much as they do not mention the perceived benefit of a mentor, yet define a mentor as someone who has responsibility for the students' learning and the patient care and safety. Of these five articles, the work of Stagg et al. (2012) is the only one to mention patient safety and care.

When reading articles about mentoring, one cannot fail to notice the continued reference and linkage between mentoring and job satisfaction. Job satisfaction can be broadly defined as

how happy or content one feels in one's work (Business Dictionary, 2016). A similar definition of job satisfaction was found in other online sources.

The work of Baranik et al. (2010) in particular states that mentoring can have a positive impact, and results in higher levels of job satisfaction for both the mentor and mentee compared to those not in a mentoring relationship. Many articles briefly refer to job satisfaction but do not explain why the amount of job satisfaction one has is important to us. It is rather presented as a fact that one must aspire to gain higher levels of job satisfaction but, in the mentoring articles, no more detail is presented. The assumption made in the articles is that the mentoring process leads to higher levels of job satisfaction – but no consideration for the counter argument is given, in that people with naturally higher levels of job satisfaction might tend to be the people who get involved in mentoring relationships.

Throughout the Baranik et al. (2010) article, the authors cite several articles to support their claim; however, much of the work cited is published by the same authors i.e. by Baranik or Eby. This citing of oneself can lead to bias in findings and can make one question the reliability and validity of the claims being made (Sammarco, 2008). Lillian Eby is a prominent researcher in the United States, collaborating with many other authors. With over 500 publications to her name, and given that mentoring is one of her key areas of interest, it is expected that her name might appear frequently in such literature searches. Whilst throughout Eby's publications the relationship between mentoring and higher levels of job satisfaction is made, there does not appear to be a clear foundation for this claim and it contradicts the work of Cuesta and Bloom (1998). Cuesta and Bloom conclude that there is no significance in the relationship between the role of mentoring and increased job satisfaction, and job satisfaction is not dependent on the quality of the mentoring received. Their study considered the opinions of 466 student midwives. They do however recognise limitations, the main one being that the study was undertaken in only one American college. The study was also undertaken in 1998, so may not be truly representative of the current situation or of other health professionals. There is no consensus on the linkage between job satisfaction and mentoring.

In order to present a balanced perspective, there also had to be consideration of the limitations or challenges associated within mentoring.

2.6 Challenges of mentoring

Some limitations of mentoring have been stated by Kowtko (2010). These include limited access to the mentor; but she does advocate the use of electronic media in the mentoring process, as this could help develop the relationship between the two parties, in addition to face-to-face meetings to alleviate these potential limitations in mentoring. Limitations of time, for both the mentor and mentee, can be said to cause problems with the mentoring, and difficulty in contacting one's mentor due to lack of time was reported. This was stated as an important issue by 21% of respondents in the study by Henwood et al. (2011). They advocate the use of email and telephone contact as a suitable method of communication, alongside face-to-face mentoring. Harris (2013) also explains the need to make the most of telephone, email and other internet services to facilitate a good level of communication within the mentoring relationship. Tourman et al. (2012) discuss the lack of time within mentoring as an important issue, but only acknowledge the lack of time for the mentor and assume the mentee has no such time constraints.

Conflict and mismatch between mentor and mentee is described as a definite source of difficulty in the mentor/mentee relationship. Meinel et al. (2011) briefly mention the potential disadvantage of the possibility of conflict between the mentor and the mentee. In the Nick et al. (2012) model of excellence, there is no mention of conflict between the two parties; however, they do discuss the importance of correctly matching mentor and mentee. Nick et al. (2012) describe that in order to ensure the most productive relationship, the mentee should have some say in who their mentor should be. Eby et al. (2010) discuss bad experiences between mentors and mentees and consider a mismatch of people being a main source of problems. Straus et al. (2009) also agree that a failing of the relationship between mentor and mentee can lead to failure to pass the course. Eby et al. (2010) suggest that in the training of mentors, strategies for conflict management should be taught in case such mismatches occur, to stop them escalating. Eby et al. (2010) also explain that there should be the option for the mentee to request a new mentor without any negative repercussions. At this University, students have been advised to keep the same mentor for the duration of their ultrasound course but perhaps more consideration should be given to allow students to change their mentor if they can provide adequate reasons to support this. In the same vein, the mentors should be able to request not to continue the mentoring process if they feel the mismatch could negatively affect their students. Unless the mentor and mentee are equally committed to the relationship, problems can occur between them (Poteat et al., 2009) and changing

mentors may avoid these problems. However, it must also be remembered that the NHS has a commitment to team-working and people should, where possible, learn to work together regardless of personal feelings. This is contradicted, nevertheless by Kay and Hinds (2005), who assert that compatibility between the mentor and mentee is vital and the two must be carefully matched. Suggestions for how this matching should take place are not detailed, other than to imply it is the programme coordinator who should be responsible. In the case of the ultrasound course at this University, this would be me; however, I would question if I would be the best person to do this because I do not know the students and their potential mentors in advance. As a result, Kay and Hinds' (2005) suggestion may not be directly applicable to my practice. Whilst Kay and Hinds' (2005) book has lots of useful, practical information for mentors, mostly it is presented in bullet form. From the viewpoint of this research, more depth of information was sought, and is needed, to allow assessment of its reliability and transferability to the specific area of practice in ultrasound at this University.

Previously, at this University, ultrasound students had no involvement in deciding who their mentor was. Given the close working relationship that the mentor and student develop over the duration of the ultrasound course, perhaps this is something that should be considered further. Although the work of Straus et al. (2009) is based on a small sample size, the discussion of mentoring in the medical profession is comparable to an ultrasound situation and they do advocate the mentee being able to choose their own mentor.

2.7 The mentoring relationship

The nature of the relationship between the mentor and the mentee can unfortunately be a cause of great stress and have a remarkable effect on both parties' psychological well-being (Hobman et al. 2009). Therefore, ensuring an effective relationship between the mentor and mentee is advisable to ensure stress-causing negative behaviours are acknowledged and not permitted to continue. As previously mentioned, Nick et al. (2012) explain the matching of mentors and mentees is seen as crucial in maintaining the relationship – although a weakness of their work was not to provide details regarding the matching process. Cook et al. (2010), who also acknowledge the crucial nature of the matching process, present the idea of a speed dating style of matching. As speed dating has been seen as successful in the dating world, the same theory – it is suggested could be used with matching of mentors, by allowing mentees and mentors to spend a short time together to determine if they have chemistry and the

potential to be able to work well together. This is suggested by Cook et al. (2010) as a potential solution to avoiding bad relationships. The very small sample size (n=13) of the Cook et al. study is acknowledged as a weakness of their investigation. They do, however, provide sufficient detail of their methods to allow replication. Their results show that both mentors and mentees highly rated the activity, and the paper states that no long term or durable mentoring relationships arose as a result of the speed dating activity. The aim of the study was to evaluate the speed dating event as a singular element, which it did. The conclusion is that a speed dating or speed mentoring event might have promising outcomes. Following on from this study, it might be worth considering using such a speed matching process within ultrasound students and potential mentors. As ultrasound students are required to have mentors, the lack of durability of the relationships – as seen in the Cook et al. (2010) study – might not be applicable.

Harris (2013) recognised the outcomes of an effective mentoring relationship as important, and conducted a study to investigate how the perceptions and expectations of mentees affect the mentoring relationship. A sample size of 43 was achieved; however, the data collection tool which was used was not clear. It was stated that a PMRS (perceptions of mentoring relationships survey) was used, but no detail about the development of this was given and very little detail of the content provided: such detail would have aided in understanding of the results presented. Another perceived flaw in this study is that only the opinions of the mentees were sought. If those of the mentors were also included, the opinions of the two groups could be compared and contrasted to allow a better understanding of the perceptions and expectations of the role. Regardless of any limitations of the study, the conclusion that if a mentor and mentee have an awareness at the outset of the relationship regarding each other's perceptions and expectations of the relationship, this may have a positive impact on the overall mentoring outcome, and this can be applied in practice. Even if the method cannot be replicated, there may well be some benefit in encouraging mentors and mentees to consider and discuss expectations and perceptions of the mentor's role, to help facilitate an effective relationship over the duration of the mentoring relationship. Discussion of these issues was implemented in the mentor training and student inductions for the 2014 intake of ultrasound students within this University. Further details of the development of mentor training and student induction, including changes made, are provided in Chapter 7.

Following on from consideration of each other's expectations and perceptions of the role of the mentor, Kirkpatrick (2015) states that many misunderstandings arise about the actual role of the mentor. Harris (2013) defines the role of the mentor as incorporating many elements, broadly defined under the headings of personal support, professional development and role modelling. These categories are similar to those detailed by Morton-Cooper and Palmer (1999). However, that which in ultrasound is known as mentoring, Kirkpatrick (2015) expresses instead as *preceptorship*. Preceptorship is defined as working with someone over a set period of time to guide and teach a certain skill (Kirkpatrick, 2015). Whilst this definition summarises the role of the ultrasound mentor, the terminology is different. Preceptorship within ultrasound departments is commonly assumed to be the period after qualification, normally lasting up to one year. This highlights the differing terminology and expectations within different fields regarding mentoring, and again supports the point Harris (2013) makes about the importance of defining expectations. She concludes that regardless of the title the role is given, it is what actually happens that is important, and this is a point also supported by Haggard et al. (2010) and Black et al. (2004). Sommer et al. (2013) explain that many authors might refer to mentoring when they actually mean something else. They are clear in their definition in that mentoring does not include teaching, supervising or preceptoring; however, they do not define what they consider preceptoring to be. This difference in roles and terminology will be investigated as part of the main study and also facilitated in the development of the overriding conceptual framework for my study: detail about the development of which is provided in Section 2.19.

2.8 Who is responsible for learning within a mentoring relationship?

The work of Stagg et al. (2012) places the responsibility for student learning with the mentor. One could argue that the student, as an adult, is responsible for their own learning, with the support of a mentor. This contrasts with the findings of Veronneau et al. (2012), who highlight that one of the most important factors for a mentee is to take initiative and responsibility for their own learning. The systematic review by Stagg et al. (2012) was discounted from further discussion, partly due to this differing viewpoint but also due to their methodology and transferability of findings. While a different viewpoint does not make it wrong, the transferability of findings of a study based in rural and remote Australia bears little relevance to current practice in the UK. The conclusion to their review of 36 out of 311 articles is that

mentors do have an influence. They do not state if this is a positive or negative influence and do not clearly justify the statement.

The review article by Nick et al. (2012) presents what they refer to as a model for excellence in mentoring. However, it is not clear upon reading the paper on what grounds they make this claim. The details of their methodology are sparse and not reproducible, and no results are presented. They explain how the authors undertook mentoring and then met to discuss the findings. There are no details about who the authors are, how they undertook mentoring or how the effectiveness of mentoring was measured. The discussion starts by informing the reader that they are providing us with six tools of best practice in mentoring, which they proceed to explain but do not justify these best practice guidelines. They are not tested on another group with different mentors in different situations. Whilst Nick et al. (2012) make some interesting points, in particular about formal versus informal mentoring and the matching of mentors, there does not appear to be any evidence base for the claims of best practice. A better title would perhaps be: "A case study showing how the authors undertook mentoring", rather than making claims of best practice and excellence.

Acknowledging the role that the mentor has to play in supporting the student's learning is vital, however not all knowledge is obvious in its nature, leading onto a discussion of tacit knowledge and its application to ultrasound practice.

2.9 Tacit knowledge

There are a plethora of textbooks from which one can learn or teach the theoretical aspects of ultrasound scanning. It is proposed that tacit knowledge is when we can know more than we can tell (Polanyi 1966 cited in Kothari 2011 and Eraut 2000) which is why the development of the practical skills required to undertake an ultrasound scan is more difficult to teach and learn as it relies on the transfer of tacit knowledge. Kothari (2011) explains how one's tacit knowledge is often difficult to articulate to others, whereas Holste & Fields (2010) declare that tacit knowledge is impossible to put into writing. Eraut (2000) whilst agreeing with the difficulties of imparting tacit knowledge, reassures that it doesn't actually have to be put into words. Kothari (2011) explained that transfer of tacit knowledge can lead to more effective health services but if tacit knowledge cannot or is not often put into words, we need to consider how it can be imparted, particularly within the ultrasound environment. During a

one-year ultrasound course at this University, a student will spend approximately one sixth of their time at University attending taught sessions, the remaining five sixths of the year is spent within their clinical department. Williams (2010) described how more valuable teaching and learning takes place on the job compared to learning that takes away from workplace such as in a University.

The transfer of tacit knowledge within ultrasound training can take place between the student and their mentor or the student and any sonographer. Regardless of who is transferring the knowledge to the students, there are a few common principles that are required. Tacit knowledge, according to Holste & Fields (2010) can only be transferred if there is a level of trust between the two individuals. As the development of the mentoring relationship changes over time, so the willingness to transfer tacit knowledge increases (Holste & Fields 2010).

Tacit knowledge is transferred when working alongside others (Eraut 2004) and sharing face to face interactions (Holste & Fields 2010), both of which are applicable in the ultrasound teaching and learning setting. To relate literature to specific ultrasound practices, one can start by learning through close observation (Holste & Fields 2010) as happens at the start of the ultrasound training period where learning is acquired in the midst of action (Williams 2010). As well as observation, hands on practice is also required (Ogrinc et al 2004) and from this prolonged, direct hands on experience, knowledge is developed (Kothari 2011). Ultrasound practice cannot be learnt from a single episode but instead from an accumulation of several episodes of leaning (Eraut 2004), once a student is fully involved in performing the task (i.e the ultrasound scan) they should then reflect on their learning. Williams (2010) advocates the use of the Kolb's reflective cycle to aid this reflection.

Eraut (2000) detail how even more knowledge can be gained if the learning takes place as part of a mentoring relationship (as with ultrasound practice in this University) where explanations are expected and challenging tasks are undertaken (Eraut 2004). These given explanations need however to be perceived as reliable if they are to be trusted (Holste & Fields 2010), explanations are enhanced by the inclusion of analogies, metaphors, stories and personal strategies (Holste & Fields 2010). However part of the reflective process needs to be encouraging students to question the everyday assumptions that they encounter in practice (Williams 2010).

There are some perceived challenges to the transfer of tacit knowledge, as in order to facilitate the transfer of knowledge and subsequent learning requires time (Williams 2010). In an ultrasound department where the patient is the priority, this facilitation of additional time for learning requires support from mentors and departmental managers (Williams 2010). Giving suitable feedback to the student on their practice to allow reflection and development is also important, and again requires time for discussion (Burke et al 2014 & Eraut 2004)

Eraut (2004) details that much of the tacit knowledge learned or taught is within the informal setting, whether mentoring is best in the formal in informal setting will be discussed in Section 2.17, the summary in Table 10 being that our current practice is a mixture of formal and informal mentoring thus aiding in the facilitation of the transfer of tacit knowledge.

Dreyfus (1982) documents the levels of skill development from Novice to Expert. The newly qualified sonographer is required to be 'competent' i.e able to deal with standardised or routine situations. Progression to expert over time, where intuition is needed, this is particularly relevant to the medical field as 20% of the time medical decisions fall outside national guidelines, thus needing experience and intuition (Eraut 2000 p125)

Having discussed benefits and challenges associated with generic mentoring, and having discussed the tacit knowledge transfer, it is now prudent to consider the mentoring literature in specific relation to ultrasound practices.

2.10 Ultrasound education

All the articles returned in this section related to the training of doctors in the use of ultrasound, rather than sonographers as is most relevant to this study. For the purpose of this review, the term *ultrasound education* is used in relation to the training of sonographers and not to doctors who use ultrasound. This identified a lack of published research relating to sonographers. Some of the issues highlighted in the articles regarding doctor training may be deemed relevant to ultrasound education, for example: mentoring, supervision and support.

The articles that discussed medical doctors' training in ultrasound identify the overall recognition that there is a lack of standardisation in the level and standard of ultrasound training, as well as a shortage of trained staff (EFSUMB, 2006). It is also widely recognised that there is a shortage of sonographers in the UK and worldwide (SCoR, 2011). Within the UK there is the Consortium for the Accreditation of Sonographic Education (CASE); this self-appointed independent regulatory body aims to ensure that all providers are of a comparable

standard, with appropriate assessment procedures. There is currently no such regulatory body for the use of ultrasound by doctors, thus going some way to explain why a number of writers (e.g. EFSUMB, 2006; Goldberg, 2003; Maul et al., 2004; Neri et al., 2007) state there is a lack of standardisation in training. Doctors sometimes register on university- based ultrasound programmes to formalise their training (BMUS, 2017). Anecdotal evidence has shown that doctors who have attended such ultrasound courses have reported that this has helped them gain promotion and consultant status sooner than if they had not undertaken formal ultrasound qualifications.

2.11 Mentoring within ultrasound practice

Within Section 1.4 a variety of possible definitions of mentoring were presented. Two additional definitions, while similar, are deemed suitable and relevant to ultrasound:

> A mentoring relationship is one that is enabling and cultivating,
> a relationship that assists in empowering an individual within the
> working environment. (Morton-Cooper & Palmer, 1993. P. 59)

> A structured process for supporting professional learners
> through a significant career transition. (Levy, 2014, Excellence in
> Research Conference)

Whilst these statements give an overview of mentoring, they do not give specific details about what the role of the mentor actually entails. If a mentor is unfamiliar with the expectations or requirements of the role, how can they be expected to carry out the role to their fullest potential? When mentor training on the ultrasound course at this University has been provided in the past, some of the roles of the mentor have been explained and discussed. However, it is becoming more evident that the role is much more multi-faceted than first thought and that more detail about the differing aspects of the role should be included within the training.

The earlier versions of this literature review considered different mentoring practices, such as benefits and responsibilities; also the level of formality to the relationship, and the matching process between mentor and student. Further literature related to mentoring has been added over the past three years to allow further areas of mentoring to be evaluated.

The formal versus informal nature of the mentoring process relates to the structure and guidance given to the mentors to assist with their role. Originally, processes at this University

were not formalised and little guidance was given to the mentors about how to structure their role. The matching process and relationship between the mentor and the student was considered by all the literature as identified. Staffs at this University are not involved in the matching of the two and no consideration was given to the significance of this. As this study progressed, an awareness of the importance of this relationship was identified and as a consequence included within the mentor training.

Table 7 lists some of the keywords describing the roles of the mentor according to Morton-Cooper and Palmer (2006); none of the other articles or books read provided a similar overview of the role in this way, so comparison cannot be made. When considering the training mentioned, currently the focus is on the functional aspect with little or no mention of the personal or relational requirements of the role: changes to this for future mentor training days were then considered.

Table 7

Mentoring role (Morton-Cooper & Palmer, 1999, p. 44)		
Personal, promoting	Functional, providing	Relational, facilitating
Self-development	Teaching	Interpersonal relations
Confidence building	Coaching	Social relationships
Creativity	Role modelling	Networking
Fulfilment of potential	Counselling	Sharing
Risk taking	Support	Trust
	Advice	
	Sponsorship	
	Guidance	
	Resources	

A requirement for entry onto the ultrasound programme in this University and other UK higher education institutions (HEIs) is that students are employed within an ultrasound department who will fully commit to supporting their training and who will provide students with a specific mentor. Whilst mentoring has been supporting training for many years, it is only recently that universities in the UK have begun to formalise the process (Morton-Cooper & Palmer, 1999).

As Morton-Cooper and Palmer (1999) observe, the majority of current ultrasound students are working within the NHS, which is renowned for being busy and understaffed and has a culture of getting on with things rather than reflecting, mentoring, or communication. They also comment that universities continue to have high expectations of these mentors despite the perceived diminishing of NHS resources (Morton-Cooper & Palmer, 1999).

2.12 Ultrasound at this University.

In relation to teaching, learning and assessment on the ultrasound programme at this University, there are a number of specific areas which warrant consideration, these being the mentor role in the summative assessment, use of our virtual learning environment (VLE), portfolios as an assessment cumulating in consideration of the formal versus informal nature of ultrasound mentor practices specific to this University.

2.13 The mentor's role within summative assessment

Whilst investigating the role of the mentor specific to ultrasound practice, the area of involvement within assessment was noted as an area worthy of greater consideration as follows.

One of the roles of the mentor, as defined by the ultrasound course at this University, is for the mentor to act as the second marker in the final clinical summative assessment. This aspect of the role contradicts the suggestion by Kay and Hinds (2005) that the mentor should be seen as independent of assessment. They do not explain a rationale or justification for this decision, so careful consideration should be given before current practice is altered. (However, one must be aware of differing opinions and their potential impact on the student and their experience.) Kilgallon and Thompson (2012) disagree with the opinion of Kay and Hinds (2005), as they state that mentors can make an objective decision about a student performance in a summative assessment, in their role as healthcare professionals. Other departmental staff can be involved in formative assessment as long as suitable, timely

feedback is given. For the summative clinical assessment they conclude that the opinion of the mentor is most valid (Kilgallon & Thompson, 2012).

The work of both Kay and Hinds (2005) and Kilgallon and Thompson (2012) is specifically related to mentoring in healthcare clinical practice, so the fact that they differ in their opinions can lead us to believe that there is no definitive answer in this area. Asking the opinion of the past and present mentors and students on this matter may help inform strategy for the future, either to confirm what is currently done, or to suggest an alternative.

2.14 Virtual learning environments

In its 2012 publication on Technology Enhanced Learning, the Department of Health in the UK explained the benefits to patient care of integrating an e-learning approach that can be applied to the mentoring relationship (DOH, 2012). The ever-changing amount and type of technology available can be utilised in new and different approaches to mentoring, according to Jaffer et al. (2012).

It is a widely asserted belief that this University has been a leading institution in blending learning initiatives since the Higher Education Funding Council for England (HEFCE) funded a Centre for Excellence for Learning and Teaching from 2005-2010. All students enrolled at this University have access to a VLE, to support their learning. It is recognised within the School of Health and Social work that whilst the undergraduate students make continued and appropriate use of the VLE, postgraduate students – including those studying ultrasound – make very limited use of this resource. The members of staff who mentor students from this University have access to the online discussion group where mentors can share ideas and where material is uploaded to inform and support. Monitoring has shown that this group site is used very rarely. In a similar way there are Twitter accounts for providing updates for undergraduate radiography students and postgraduate ultrasound students. The undergraduate students engage with this resource, whereas the postgraduate students do not, as a general rule.

These personal reflections from my own experiences contrast with the findings of Jaffer et al. (2012, p. 123). They state that "online discussions tend to be deeper and more diverse and engage students more than classroom discussions". They then state that "this has important similarity to the mentoring context". The work of Jaffer et al. was undertaken in relation to PG medical students in the UK. This is a group that should be similar and comparable to PG ultrasound students. Jaffer et al. describes an area of mentoring good practice which occurred within vascular ultrasound, where they used a Facebook group which assisted in peer support, but they omit further details, and there are some shortcomings in their work. Their search found 44 articles between 1950-2012 with only 16 being relevant, which is a surprisingly small number, and no detail is given to indicate what made these 16 relevant. Egan and Song (2008) also mention the use of social networking and how it can be used in mentoring. They state that the benefits can be evidenced in enabling the mentor and mentee to bond, share knowledge and demonstrate role modelling practices. This relationship between mentor and mentee is further discussed in Section 2.13: problems of mentoring. Whilst some mentee/mentor relationships might be happy to use social networking in their mentoring and relationship-building, some may prefer to maintain the distance between work and social life: neither the Jaffer et al. (2012) study nor the Egan and Song (2008) study consider this.

2.15 Portfolios

The importance of utilising a range of communication methods to facilitate the relationship between the mentor and mentee is important, as previously discussed (Henwood et al., 2011; Harris, 2013; Tourman et al., 2012). Including the university staff in elements of this mentoring relationship is also needed as a means of supporting both the mentor and the student and initiating remedial action if required. A portfolio is utilised as one means of including all three parties in the professional training and support of the student sonographer, linking with both of the research questions.

Evidence of continued professional development (CPD) is a requirement of registration with the Health and Care Professional Council (HCPC, 2012) and the Nursing and Midwifery Council (NMC). The majority of student sonographers are registered with the HCPC or NMC and are required to keep a portfolio of evidence, including some reflective practice which must be presented on request. The inclusion of a portfolio as a means of guiding the mentor through formative and summative assessment should therefore be familiar to student sonographers,

and is utilised as a formative assessment within the ultrasound course at this University. The content and format of the portfolio has been changed dramatically over the duration of this study in order to more overtly guide the mentor and support the student. These changes and the rationale are explained in more detail in Chapter 7.

Publication of systematic reviews regarding the use and effectiveness of portfolios in education will now be considered. One review focuses on their use at undergraduate level and another at postgraduate level.

Tochel et al. (2009) describe in detail how their systematic review was conducted. Their methodology provides a clear discussion of its inclusion and exclusion criteria and all articles were blind reviewed by at least two reviewers. This use of blind review is similar to that used in peer reviewed journals, which adds to the reliability and decreases the subjectivity of their review. Whilst the systematic review by Buckley et al. (2009) contains some detail regarding their review methodology, it is not as detailed as that of Tochel et al. (2009). It is understood that there are different conventions of detail inclusion in review methodologies and, while this does not directly undermine the quality of the review, more detail would have been beneficial in determining reliability and subjectivity but also in aiding methodological design. Despite the fact that both articles define inclusion and exclusion criteria for their studies, Tochel et al. (2009) provide little detail in comparison to Buckley et al. (2009). Justification of their choices for this would have helped aid understanding of the importance of certain criteria. One of the inclusion criteria applied by Tochel et al. (2009) is that all their reviewed articles should be relevant to postgraduate study. However, in their review they include articles specific to undergraduate study. This anomaly in application of inclusion criteria could lead one to question how rigorously the other inclusion/exclusion criteria were applied.

An area where Tochel et al. (2009) and Buckley et al. (2009) differ is in their findings of the usefulness of portfolios in relation to the promotion and encouragement of reflective practice. Buckley et al. (2009) assert that the use of a portfolio can improve a student's engagement with reflection. Tochel et al. (2009) assert that on occasion, portfolio usage can promote reflection; they also state that it can have the opposite effect and inhibit the reflective process. Some evidence is presented that the requirement to reflect in a portfolio could interfere with a student's normal CPD practices as required for professional registration. The difference in

the findings could be attributed to the undergraduate/postgraduate differences in the reviews, as undergraduates do not have to formally meet the CPD evidence requirement, so they may not be in the habit of keeping a reflective portfolio. Buckley et al. (2009), while stating that portfolios encourage reflection, conclude by saying that the quality of these reflections cannot be assessed. Tochel et al. (2009) make no mention of quality in their review of reflective practice.

Portfolios are used as one method to provide a link between the academic staff, students and their clinical supervisors/mentors. The reviews from Buckley et al. (2009) and Tochel et al. (2009) agree that one of the significant factors regarding student engagement with portfolios is how well the student's mentor engages with the process and supports the completion of the portfolio and the reflection. One of the barriers to a student's effective use of a portfolio is asserted to be the mentor, who may have limited knowledge or understanding of the requirements of the portfolio (Tochel et al., 2009). There are sections in the student's portfolio for their completion, feedback and comment. Supervisors are invited to attend training workshops every six months, where one element discussed is the role of the portfolio and requirement for completion by student, supervisor and academic staff.

The conclusions of these two articles differ. Buckley et al. (2009) question the potential benefit of using portfolios at undergraduate level and recommend further work to be undertaken in this area. Tochel et al. (2009) suggest there is strong evidence to support the use of portfolios, either formative or summative, at postgraduate level.

2.16 Formal versus informal mentoring

There appears to be ongoing debate as to whether formal or informal mentoring offers the most advantage. Nick et al. (2012), Kowtko (2010) and Meinel et al. (2011) explain the advantages and disadvantages of each method, but none draw conclusions as to which method is deemed best. The students on the ultrasound course at this University can have a combination of formal and informal mentoring, therefore they can gain experience of the advantages of both methods.

Regardless of whether a formal or informal mentoring programme exists, Weinburg and Lankau (2011) advocate the formal mentoring process and state that the amount of mentoring is determined by the mentor. A formal mentoring programme including very specific guidelines and requirements may remove some of the perceived inequality between mentors, ensuring they all provide comparable support. In an informal mentoring scheme, this could allow some mentors to shirk their responsibilities in mentoring; this could then reduce the mentee's respect for the mentor, which Weinburg and Lankau (2011) state is an important factor in maintaining the relationship. Wang (2010) also supports formal mentoring; however, she explains that by having a too formalised process this could limit the success of mentoring if the mentor feels too constrained to follow a formal route. Different students have different levels of needs and support requirements, so the mentor needs to adjust the level and extent of mentoring as appropriate, which is easier in an informal setting (Morton-Cooper & Palmer, 1999). The Wang (2010) article, based in a Chinese setting with the aim of investigating a non-Western method of mentoring, offers less relevance to the UK format.

Morton-Cooper and Palmer (1999) state that a true mentoring relationship is informal in nature and may last for up to 15 years. They also assert that the mentor and mentee should choose each other. Based on this description, the mentoring of the student whilst on the ultrasound course is not true mentoring, as the relationship lasts for a maximum of 24 months duration. The debate as to whether this relationship should be formal or informal is under consideration and there are also differences in practice as to whether the mentee has any say in who their mentor should be, and vice versa. Morton-Cooper and Palmer (1999) go on to detail the true mentoring relationship; however, they do not provide detail of how they have drawn this conclusion. In their textbook the facts are presented without justification, though this can be commonplace in textbooks as opposed to journal articles.

2.17 What's in a name?

Following the exploratory study reported in Chapter 4, it became increasingly apparent that use of the term *mentor* was not used consistently by all professions represented by respondents in the exploratory study neither did not match that which was first defined in Section 1.4. Therefore a further literature search was undertaken to consider the name given to the *mentor* or 'equivalent person'.

The work of Jacobi (1991), does not include or acknowledge mention of teaching and do not give consideration to working with the student on a daily basis, as happens within ultrasound training. Data analysis from both the student interviews and the mentor questionnaires highlighted the fact that the mentor is also expected to teach, supervise and perform many other roles and tasks not traditionally associated with mentoring. I began to consider whether the title of mentor was not always appropriate for the role this person undertook. Hence it was decided that the literature review should be expanded to investigate further areas, using the previous search strategy as a basis. New key words were incorporated to include: teaching, clinical practice, clinical education, supervision, clinical supervision. Previous detail regarding limits set and the use of Boolean operators was maintained.

Some of the alternative names for the mentor role will now be reviewed and discussed. Comparison and contradiction with current practice of the ultrasound programme in this institution will be made along the way. Finally, a national perspective will be introduced before a conclusion is drawn regarding whether the actual title of mentor is correct or important. The first title considered is that of a preceptor.

2.17.1 Preceptor

This element of the literature search highlighted a previously relatively unknown and unused term in the UK: that of *preceptor*. This term is used predominantly within the nursing literature in relation to nursing practices. Carlson et al. (2009) straightforwardly describe this person as someone who helps link theory to practice through teaching. Another excellent definition is that provided by Myrick and Yonge (2005, p. 4), who state that a preceptor is "a skilled practitioner who supervises students in a clinical setting to allow practice experience with patients". This definition appeared to align with parts of the role that the mentors within ultrasound undertake. Further reading about the preceptor role identified that in the UK the term is used interchangeably with that of mentor. The term *preceptor* originated in the USA and is used in relation to teaching specifically within health disciplines (Myrick & Yonge, 2005), whereas the term *mentor* is used in wider spheres. I am not sure of the feasibility or benefit in potentially changing the name of ultrasound mentors to preceptors. The role of preceptor or mentor within nursing, while it parallels that of ultrasound to some extent, also has some significant differences. The NMC is the regulatory body for nurses and midwives working within the UK. If a nurse or midwife wishes to undertake a mentoring role, then prior to

commencement, they are required to undertake and pass a recognised formal mentoring training programme (NMC, 2008).

Ultrasound mentors have no requirement for such training prior to undertaking their mentoring role, and the mentor training provided by this University does not include detail of the practicalities of how to teach. Despite a requirement within nursing to attend formalised mentor training, hospital management do not seem to be entirely supportive of this and were reported as not always being helpful in facilitating such attendance (McCarthy & Murphy, 2008). This claim of lack of management support made by McCarthy and Murphy is boldly stated in their conclusion and given its own subheading. Yet throughout their article there does not appear to be sufficient basis for such a claim from the results presented. Taking the assertion at face value, however, if the required mentor training is not supported by nursing and midwifery where it is a regulatory body requirement, the optional mentor training for sonographers is even less likely to be supported by hospital management. With ever increasing workloads and diminishing budgets within ultrasound (NHS Benchmarking, 2016), attendance at mandatory training takes priority over attending optional courses.

As the title of preceptor was not found to be wholly suitable as an alternative to that of mentor, the title of teacher was then considered as an option.

2.17.2 Teacher

The majority of UK NHS health courses are university based, encompassing a significant clinical practice element. Anecdotal evidence from students and sonographers indicates that the university-based staff are viewed as those who teach, having undertaken formal qualification in teaching, and the clinical staff are regarded as those who oversee the clinical elements of training. The clinical input from sonographers and the mentor is viewed as one of the most crucial elements in student learning, but even more important is the relationship between the student and their teacher (Fugill, 2005). In university lectures, a student might be one of a few hundred in a class, thus having a slight or insignificant relationship with the lecturer/teacher in contrast to the one-on-one basis of their clinical teaching experience, where a good working relationship is paramount. Fugill (2005) argues that the clinical person, being both a clinical teacher and a clinical supervisor, is vital in ensuring there is no harm caused to patients as a result of the student's actions. The study by Fugill (2005) is based within dentistry, which has a similar teaching and clinical practice structure to ultrasound, thus allowing some parallels to be drawn. No detail is provided regarding the potential sample size recruited for the study.

Although 98 is a reasonable sample size, it is somewhat difficult to judge to what extent the 98 student respondents are representative of the whole population of dental students. No opinions were sought from dental clinical teachers, possibly offering some bias in the findings. Following a similar methodological design to my main research study presented in Chapter 6, Fugill (2005) developed a list of desirable characteristics of the clinical teacher; this list, provided below in Table 8, will be compared and contrasted with other characteristic findings within Chapter 7, Section 7.2 of this piece of work.

Table 8

Desirable characteristics of the clinical teacher (Fugill, 2005)
Professional competence
Approachable personality
Punctuality
Availability
Consistency
Practicality
Understand limits of the student knowledge
Respect for the student/patient relationship

The characteristics described by Fugill (2005) shown in Table 8 were based on interviews with students. Opinions of the clinical teachers were not sought. This is in contrast to the main study presented in this research, where the views of both mentors and students were included.

In addition to developing the list of characteristics, Fugill (2005) discussed the feedback received by students. Only 13% of students responded that they gained sufficient feedback on their clinical practice and it was stated that perhaps a standardised form be developed, including areas for a combination of both positive and constructive comments. Feedback

should be viewed as important, as it is seen as "a fundamental aspect of teaching and learning" (Rowntree, 1987, p. 27). Formal or written feedback is even more important in ensuring that the student can evaluate their clinical practice appropriately (Clynes, 2008). Nowadays, within this institution, a standardised written feedback form is completed weekly by whomever the student has worked with most, where their strengths and areas for development are identified and then discussed with the student. This varies between universities: at a number of other institutions where I have reviewed practice, obtaining such regular standardised written feedback is not commonplace.

Being a clinical teacher requires one to facilitate learning within clinical practice; this includes taking time to explain the underlying rationale for one's practices and one's thinking processes. This enables the student to respond with more than an inconsequential 'ok', but empowers them to be able to justify, make their own decisions and explain why something is done, which are all skills that will be required of a sonographer following qualification (Fugill, 2005).

May (1983), while a dated article that leaves a certain reticence in applying the findings to current practice, does make some interesting, relevant observations. Fugill (2005) builds upon the work of May (1983), who asserts the vital role of someone actually teaching in clinical practice, with 99% of his respondents identifying teaching as an important skill for a clinician to have. This study was a large sample size (585) with responses from both clinical staff and university educators. Of these respondents only 34% had ever had any training in how to teach their clinical skill, and 62% identified that teaching is something that does need to be formally taught, since it does not come naturally, as teaching is "more than just telling" (May, 1983, p. 1632). The work of May (1983) supports the current requirement by the NMC, detailed above in 2.16.1, to provide formal teaching to its clinical staff before they are permitted to mentor or assess students.

Considering the above, teaching is seen as something that the mentor would be expected to undertake in the clinical setting. However, using the term *teacher* instead of *mentor* would not give credit to the other areas of the role, so it is not considered a suitable replacement for the name mentor. The title of clinical supervisor will now be considered as a potential alternative to mentor.

2.17.3 Clinical supervisor

Gilleatt et al. (2014) provide a definition of what they perceive should be included within the role of a clinical supervisor, and although the majority of their study is not directly relevant to my own study, these definitions on inclusion of the role are valid to include here. Gilleatt et al. (2014) separate the clinical supervisor's role down into three component parts: firstly, the administration associated with being a clinical supervisor (organisation, protocols and assessment); secondly, the educational elements (developing, teaching and mentoring) and thirdly, the supportive elements (discussion, asking questions and managing stress). All of these areas are part of the professional expectation of an ultrasound mentor. This leads to the conclusion that the term ultrasound *clinical supervisor* is more appropriate than *mentor*.

Kilminster and Jolly (2000) state that research into clinical education is one of the least investigated areas. This continues to be relevant now, given the dearth of current papers and articles regarding this subject area and in particular in relation to ultrasound. They acknowledge the importance of clinical supervision overall but state the most important factor is that of the relationship between the supervisor and the student. This is in line with the findings of Fugill (2005). The article by Kilminster and Jolly (2000), although dated, is a literature review of over 300 previously published studies. Of the 300 articles they reviewed, they comment that most have "little or no empirical basis" (p. 829) and are purely narratives. Whilst there is a place for publications of narratives, this again highlights the ongoing lack of first hand research into the area of clinical practice. Some qualities of effective supervisors are provided by Kilminster and Jolly (2000) and presented in Table 9; these will be further discussed in Chapter 7.

Table 9

The skills and qualities of effective clinical supervisors (Kilminster & Jolly, 2000)
Empathy
Support
Flexibility in instruction
Knowledge
Interest in supervision
Organisational skills
Good communication

Laschober et al. (2012) express the view that the clinical supervisor is also expected to mentor and train their student. This fits with the expectation in ultrasound where there are mixed roles of a mentor. While some parallels between the findings of the Laschober et al. (2012) study and my own will be made, they claim that their study, based on clinical supervision within addiction treatment, is distinctive and unique. Though it may have some unique qualities, the constraints of finance and workload mentioned by Laschober et al. (2012) could also apply to sonographers or other health professionals within the NHS, working under increased financial pressure with increased workloads. This leads me to think that their practices may be less distinctive and unique than they claim.

Based on a large sample size of 484 clinical supervisor/student pairings, Laschober et al. (2012) explored the perceptions of time spent within clinical supervision and found a disparity between the perceptions of the clinical supervisor and that of the student. Clinical supervisors are reported to want to spend more time in supervision; they report currently spending an average of 29% of their time undertaking supervision tasks, but would rather spend an average of 40% of their time in supervision. This would indicate that having an increased amount of time spent in supervision would be beneficial. What is interesting to note is that the perception of time spent supervising reported by the clinical supervisor was different from the reported time according to the student. Supervisors report spending on average 8½ hours per week actively engaged in supervision activities, whereas the students report being

supervised on average 5½ hours per week (Laschober et al., 2012, p. 4). That equates to over three hours per week perceived difference in supervision time: this may be due to under or over estimation by either one. On the other hand, it could be that the supervisor is undertaking supervision that is unrecognised or not perceived as supervision by the student. This links with one of the themes identified in my study below regarding differences in expectations: maybe students do not appreciate the efforts the supervisor puts in behind the scenes to support their students' training. In the case of students in my study, they are not able to differentiate between when their mentor is acting in the capacity as mentor, and when they are acting as a clinical supervisor or even a standard sonographer.

Ozcakar et al. (2013) write specifically about ultrasound mentoring, and agree with the earlier findings of Fugill (2005) and May (1983) in that supervision is a core element for clinical training. They state that this supervision should be provided by an expert, yet the nature or training requirement of the expert is not defined. Their double blind study was specifically about making accurate ultrasound measurements, although no detail is given on how the suitable measurement was achieved, or by whom. The findings show that students who have more supervision later on in their training perform to a higher standard compared with those whose supervision is focused at the start. Given that in the ultrasound programme at this University, and within other UK HEIs, there is an expectation that supervision is maintained throughout the duration of the ultrasound training, this finding of the Ozcakar et al. (2013) study cannot be directly tallied, but does act as a reinforcement that supervision is needed throughout all stages of ultrasound training.

2.17.4 A national perspective

The Sutton Trust, a think-tank who have been influencing government educational policy since 1997, include medical professions within their remit. In the Trust's report published in 2014, they set out to find what makes great teaching and how better learning could be promoted (Coe et al., 2014). Their advice for quality teaching includes: having a good level of knowledge; instructing and asking effective questions; quality relationship between teacher and student; making effective use of time; theoretical knowledge of learning and teaching; and demonstrating professional behaviour, including being supportive and communicating well. These factors will be compared with the findings of my study in Chapter 6.

Health Education England (2016) states that there has been a move away from what was traditionally thought of as mentoring, towards a current definition of making your experience and learning available to another to help them address important 'knowing and doing' gaps

Recognising the importance of mentor selection, the University of Southampton along with the NHS have worked together in order to produce a *Values Based Toolkit*; endorsed by HEE to help the selection of mentors. This easy-to-navigate website provides managers with a useful insight into the role of the mentor in clinical practice. Six core values of a mentor have been identified, these being: an ambassador, a broker of learning, an illuminator and reflector, a professional role model, an energiser and a promoter of standards (HEE, 2016). Each of these values includes details to demonstrate how that value would be expressed in practice. A downloadable form is provided for completion to aid in identifying the traits in oneself or one's employee being considered for mentoring. These values are similar to those that would be expected of an ultrasound mentor, although little detail is provided for the rationale for these six values, nor for the development of the toolkit. The toolkit has been piloted on stakeholders for suitability and, along with its endorsement by the HEE, leads me to think it would be a useful resource to inform the selection of mentors for the ultrasound profession.

2.17.5 Summary of 'What's in a name?'

Despite the difference in the names: mentor, preceptor, clinical supervisor, teacher, it is the commonalities of their underpinning values, characteristics and the duties that they undertake as part of the role which are paramount. Consequently, while no traditional definition can be found to align with this role title, it is concluded that the title is less important provided the person performs the task expected of the role. Rather than the long-established name of mentor, I wonder if the title *clinical supervisor* is a better fit to encompass all that is undertaken in this role to correctly support ultrasound students from this University through their clinical practice. But, how do these clinical supervisors know the duties expected, unless they are provided with some training in how to teach their skill in the clinical environment? To apply the Dreyfus' model of skill acquisition (1980), a sonographer, nurse, dentist etc. might be an expert or master in their professional clinical skill but they start out as a novice in the teaching of that skill; therefore consideration needs to be given in the training provided, to enable them to undertake their role as well as they can.

2.18 Summary of literature

From the reviewed literature it became evident that ultrasound practices at this University do not consistently correspond to the evidence from the literature regarding mentoring. The findings are summarised in Table 10. As the ultrasound programme at this University continues to use a portfolio as part of the course, further consideration of its format should be made, whether hard copy or electronic format. The structure and content of the mentor training provided needs to be reviewed to ensure it is evidence based and any changes made must be subsequently evaluated. It might also be worthwhile investigating how to assess the effectiveness of the mentor/mentee relationship and considering subsequent student performance/achievement.

Table 10

Summary of literature review findings		

Where does the mentoring responsibility lie?

Student:	**Mentor**:
Veronneau (2012)	Stagg et al. (2012)
Original UH practice*	Weinburg and Lankau (2011)
	Current UH practice**

Does the student have a say in who their mentor is?

Yes:	**No**:
Nick et al. (2012)	Original UH practice
Straus et al. (2009)	Current UH practice

Should the mentoring process be formal or informal?

Formal:	**Mixture**:	**Informal**:
Weinburg and Lankau (2011)	Nick et al. (2012)	Original UH practice (A mentor was allocated but limited guidance on role provided)
Wang et al. (2010)	Kowtko (2010)	
	Meinel et al. (2011)	
	Current UH practice	

Consideration of the relationship between the mentor and the student

No effect:	**Neutral**:	**Effect**:
Original UH practice	Kowtko (2010)	Meinel et al. (2011)
	Nick et al. (2012)	Eby et al. (2010)
		Straus et al. (2009)
		Poteat et al. (2009)
		Current UH practice

*Original UH practice refers to procedures within the ultrasound course at this University prior to my commencement of the EdD studies in 2012

** Current UH practices refers to procedures within the ultrasound course at this University at the time of writing

As can be seen in Table 10, there have been changes to ultrasound procedures within three out of the four areas covered by the literature review.

2.19 Development of the Conceptual framework

Finally in this chapter, the conceptual framework and its development are considered. A conceptual framework is a means of presenting an overview of the research; I have chosen to present this in a visual format. This method of presenting the same information in a variety of different formats can appeal to different learning styles. This consideration of learning styles could affect the mentor/mentee relationship as considered within research question 2 and for this reason also links with changes made to the mentor training detailed in Chapter 7 where detail about learning styles is discussed.

Figure 2.1 shows the initial manifestation of the development of the conceptual framework to frame my EdD research, developed after the literature review. I initially placed the student at the centre of the image (represented by the blue circle) as I thought that it would serve as a reminder that the student should be the central focus of mentoring. The student is supported and closely surrounded by the different sonographers who teach them, this is represented by the purple circle. This circle can be seen to fully surround the student in the diagram, the idea being that a large proportion of a student's time and learning, tacit or otherwise comes from those within the purple circle. The green circle in the diagram represented the mentor; the increased size of this circle compared to the purple one was to credit the level of responsibility, oversight and commitment associated with the mentor role. Finally an outer red circle was included to give credit to the literature informing the framework at that point. The development of this version of the conceptual framework made no mention of the university staff who link with the mentor. It was initially assumed that the mentors were surrounded by, or embedded within, literature. This assumption was not evidence based. The size of the circles in Figure 2.1 was given little consideration, giving the impression that literature is the most important factor, which it might be – but on reflection there was no evidence to support this. In effect, Figure 2.1 was a summary of my thinking following the initial literature review

and not an actual representation of any outcomes of my research. Nevertheless, along with additional reading it did aid in directing the focus of the exploratory study towards mentors and other staff involved in support and training of student whilst on placement to help answer research questions 1 & 2.
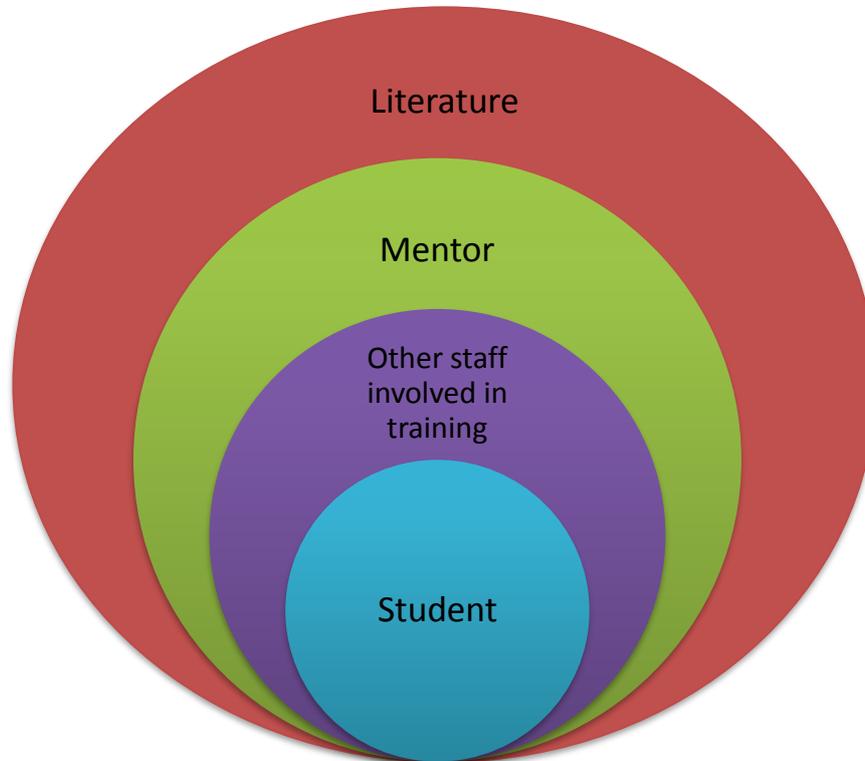
Figure 2.1 – Original design of the conceptual framework

As the exploratory and pilot studies were undertaken, there was the gradual realisation that mentoring a student was just one facet of their clinical training. Whilst mentoring remained the main focus of this research, it could not be considered in isolation. The mentor role also involves teaching, supervision and student support. There is overlap between these roles and at the same time these roles may also be performed by someone other than the mentor. These things considered, a diagram that demonstrated an overlap of roles was needed.

The final conceptual framework can be explained by first deconstructing it into its component parts, as seen in Figure 2.2. There are multiple elements that contribute to the development of a student sonographer. The student requires someone to:

- Supervise. Whilst this element of the conceptual framework does not arise directly from the literature or the findings of my research it is vital to the role of a student sonographer. The Oxford English Dictionary (2017) presents a definition of supervision as to "keep watch over someone in the interest of theirs or others security" in the case of the student sonographer / mentor relationship this is to ensure that the patients safety is maintained which is of primary importance, hence its inclusion.

- Train. Using the Oxford English Dictionary (2017) definition, to train is to teach a particular skill through sustained practice and instruction. The word *teach* was considered for use here but was discounted as its definition did not include consideration of practice associated with training nor the sustained or ongoing nature which is relevant to the student sonographer. Teaching includes transfer of knowledge and this can be verbal or tacit as discussed in Section 2.9. Responses to the main study indicated the expectation of the mentor to teach, thus justifying its inclusion in the conceptual framework.

- Support. This word was included within the conceptual framework as it arose from the literature review where it was cited as an element of the mentor role. Support also was mentioned within the findings of both the pilot and main studies in Chapter 5 & 6. According to the Oxford English Dictionary (2017) to support someone is to be actively interested in and concerned for the success of them. This is what is expected of the mentor in student /mentor relationship, which also feeds into answering the second research question.

Train, Supervise and Support are all equally important and for this reason are depicted by the same size circles in Figure 2.2. As the student also requires a mentor, this is represented by the red triangle, a triangle was selected and it gave most overlap with the three circles once combined in Figure 2.3.
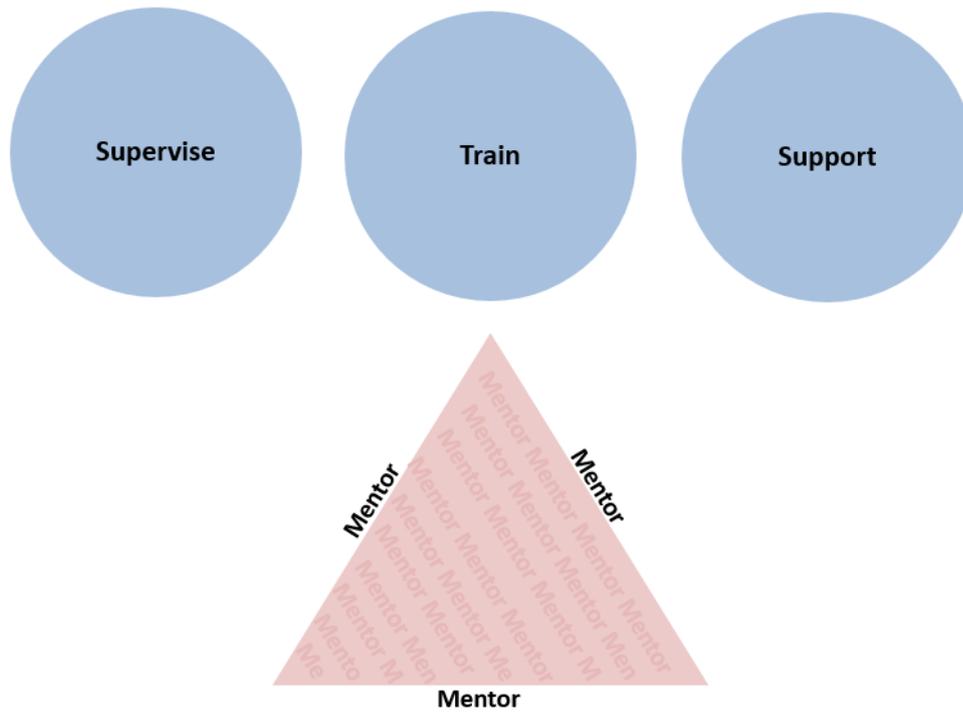
Figure 2.2 – Deconstructed framework

The separate elements shown in Figure 2.2 are then placed as shown in Figure 2.3.
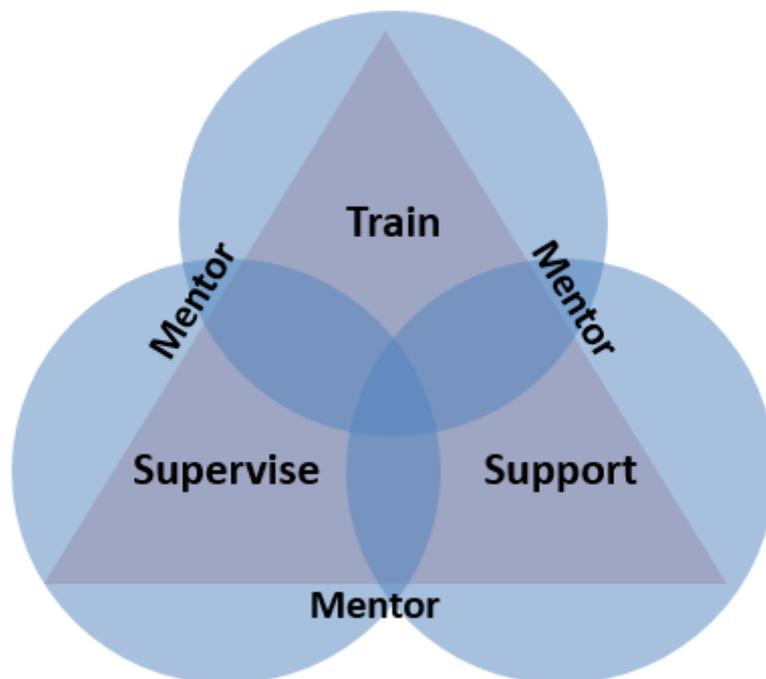
Figure 2.3 – Final conceptual framework

Supervision, training and support sometimes overlap, meaning one person might perform more than one of these roles at one time. This level of overlap can change to varying degrees in order to suit the requirement at the time. Ideally, the conceptual framework shown in Figure 2.3 would be a dynamic image, with the circles changing size and overlapping to different degrees as required. Through the student/mentor relationship it is intended nevertheless to convey the following: the mentor as the red triangle is the foundation for training the student sonographer. This mentoring is layered with the circles of supervision, support and training, which all overlap and blend into each other. This support, supervision and training can also be outside the role of the mentor: hence the circles extending beyond the triangles, as these elements can be undertaken by other sonographers, contributing to the overall training of the student. These additional factors alter the underlying mentoring: as illustrated in the triangle now appearing purple, showing that when considered alone, mentoring is one thing but when the entirety of the role is considered, it appears different. This can also link with one of the main themes identified: blurring of the role boundaries, acknowledging that this blurring happens but can be used to good effect.

The conceptual framework shown in Figure 2.3 is a visual representation of the concepts that informed this thesis.

2.20 Chapter summary

This chapter has presented a review of the literature related to mentoring. The themes that arose – responsibilities, formal versus informal, portfolios, relationship and the name of the role – all contributed to the development of the conceptual framework. The overall concepts or themes informing this research are the multifaceted role of the mentor, including training, supervision and support.

Having given consideration to the background to the study in Chapter 1, and the published literature in this chapter, the following chapter will now explore the methodological choices informing this research.

Chapter 3. Methodology

3.1 Introduction

This chapter explores the methodological choices made which underpinned the research design. The choices made ensured that the research question and aims stated in Chapter 1 could be met. The underlying rationale for the methodological decision will be shared; alongside explaining why other options were excluded. I will begin by including two quotes regarding methodology:

> There is no single pathway to good research: there are always options and alternatives. (Denscombe, 2014, p. 3)

> The quality of research is defined by the integrity and transparency of the research philosophy and methods, rather than the superiority of any one paradigm. (Bunniss & Kelly, 2010, p. 358)

These quotations are included at the outset of this chapter as they served as an encouragement to me during my research design. There was no single correct approach that I should have selected, provided that I justified the approach chosen with suitable rationale. This confidence came from having a philosophical awareness and not pursuing a route that has me "blindly embarking upon research neither questioning their underlying assumptions nor caring one way or the other" (McGregor & Murname, 2010, p. 420).

Traditionally within scientific disciplines, which have been my background hitherto, quantitative research has been used, while qualitative approaches were viewed as an "assault on tradition" (Denzin & Lincoln, 2011, p. 2). These differing opinions will be explored within this chapter.

3.2 Philosophical approaches to methodology

McGregor and Murname (2010, p. 420) assert that "philosophical assumptions are present in a study whether articulated or not" however for the purpose of this research it is important to ensure that my own philosophical assumptions are clearly articulated.

One of the many personal benefits of undertaking my Doctoral study in Education has been that my understanding of these concepts developed and the need to outline them explicitly in this thesis has been realised. These reflections assisted me to gain a clearer understanding

of my own philosophical approach to methodology. There are components within multiple philosophical approaches that I believe in and agree with. In contrast, there are parts within each philosophy that do not comfortably tie in with my thoughts, leading me to adopt a *bricoleur* approach. Before I outline my *bricoleur* approach I will explore each element separately through the next subsections and explain why no single one was sufficient for my study. After explaining the different approaches, I will discuss the qualitative, quantitative and mixed methods approaches available. The bricoleur approach that I've taken incorporates elements of traditional pragmatic, post-positivism and positivist paradigms. I will now be explain the *bricoleur* approach I've chosen, it will then be justified with details regarding which element was taken from which philosophy or method.

3.2.1 Positivism

A positivist approach aims to search for a single identifiable and measurable truth (Denzin & Lincoln, 2011). Or alternatively, the Oxford Dictionary defines it as "a philosophical system recognising only that which can be scientifically verified or which is capable of logical or mathematical proof" (Oxford English Dictionary, 2017). The aim of my research outlined in Chapter 1, like much research at Doctoral level, was not to necessarily prove anything but rather to "investigate questions, enquire into phenomena and explore issues" (Clough & Nutbrown, 2012, p. 4).

The positivist approach, which is often associated with purely quantitative research, was quickly disregarded, since one of its main failings is that it is not advantageous for the investigation of human interactions. Cohen et al. (2011, p. 7) suggest that investigating human interactions, particularly within learning and teaching, would "present the positivist researcher with a mammoth challenge". As one of the primary aspects of my main study was examining the individual relationship between mentor and student, a positivist approach was deemed unsuitable. A positivist viewpoint does not readily accept the fact that individuals are all different and unique. While it is common for professionals from similar backgrounds to have similar viewpoints, I acknowledge that all are different and although I am looking for common themes regarding mentoring, I have to be open to the fact that everyone's ideal mentoring relationship might be different. These things considered, I decided that a positivist paradigm would not facilitate this approach effectively.

3.2.2 Post positivism

Developing from the positivist approach is the postpositivist approach, which appreciates that some things can never be fully understood because of hidden variables within them (Denzin & Lincoln, 2011). Whilst the interviews I conducted as part of the main study in Chapter 6 were designed to gain a deep insight into the mentoring experience, it was impossible to identify all of the students' biases and underlying values and beliefs which caused them to view their mentor in the way they did. Data collection utilising this methodology often includes asking more questions of the participant than the positivist approach would do and is viewed as more flexible (Denzin & Lincoln, 2011). Steps have to be taken by the researcher to ensure this flexibility does not affect parity or create bias. Further detail of the precautions taken will be given in the methodology sections of Chapters 4, 5 and 6.

3.2.3 Pragmatism

Within my research I encompassed components of a pragmatic methodology. The Oxford Dictionary definition of being pragmatic is "someone who deals with things sensibly and realistically in a way that is based on practical rather than theoretical considerations" (Oxford English Dictionary, 2017). I believe that this is an accurate definition of my approach to my research. Awareness of this helps me understand some of the struggles I encountered in developing justification for my methodological choices. In research terms, pragmatists are suited to mixed methods paradigms, declaring themselves unbothered by discussions about which particular method of research to employ but instead making use of whatever is best at the time. This is a link forward to the patchwork approach discussed in Section 3.4. Mackenzie and Knipe (2006) explain how the pragmatist may use interviews and other qualitative approaches such as questionnaires, which is similar to the data collection methods utilised for the main study.

Understanding philosophical foundations and choosing those which correspond with one's research is not the final categorisation: understanding qualitative and quantitative approaches and their linkage with a mixed methods approach is required. Detail about these choices and the reasons behind them will now be presented.

3.3 Exploration of qualitative, quantitative and mixed methods approaches

Denzin and Lincoln (2011, p. 1) refer to the "paradigm wars of the 1980s", where there were arguments within academia regarding qualitative and quantitative approaches concerning

which one was considered most worthy. This debate continued into the 2000s with "a new round of arguments and debates over paradigm superiority" (Teddlie & Tashakkori, 2003, p. 7). Those from scientific backgrounds generally believed one should stay within the more traditional quantitative approach, and that qualitative approaches may not be sufficiently objective and are unreliable (Denzin & Lincoln, 2011). Merton and Kendall (1946, cited in Mackenzie & Knipe, 2006) state that arguments surrounding qualitative versus quantitative should stop and that, instead, researchers should focus on the advantages that each approach has to offer. Denzin and Lincoln (2011) advocate the use of more than one method in order to gain the best from data, and this blend of qualitative and quantitative is known as a mixed methods approach. Rather than view mixed methods as just a combination of qualitative and quantitative, Denzin and Lincoln (2011) argue that mixed methods should be considered as a standalone approach, equal alongside qualitative and quantitative as a third approach in its own right. While making this claim, Denzin and Lincoln (2011) do present an opposing argument, in that due to their underlying epistemologies, it may be totally inappropriate to combine qualitative and quantitative approaches. Denzin and Lincoln (2011) continue to argue that the cost of undertaking more than one method is greater than if a single approach is used and also that a longer time is taken to collect the data. Although the point regarding cost and time is valid, a mixed methods approach does not necessarily mean undertaking data collection twice via both qualitative and quantitative approaches and then combining the results, but rather takes elements of both to complement the particular study. Continued debate about which approach is best is unproductive, as all approaches to research can be shown to have their advantages and disadvantages.

Davies and Hughes (2014, p. 22) state that "researchers may make use of both methods at different times (or even at the same time) depending on the nature of the question they are seeking to answer … both methods present challenges to the researcher". Reference to "both" is used in terms of quantitative and qualitative; mention of mixed methods is also acknowledged, however it is not given any further consideration by Davies and Hughes (2014).

According to Robson (2002) Hart (2007), and Silverman (2005),the approach selected for a study should be the one that best suits the particular research question at the time, provided that you can "argue convincingly for your preferences" (Hart, 2007, p. 234)

As outlined in Section 3.2.3, I undertook elements of a pragmatic approach to my research. The pragmatist is said to ignore the qualitative versus quantitative debate and just get on with what works (Robson, 2002), and the fact that those with pragmatic opinions often select a mixed methods approach aligned with my thinking at the time (Denzin & Lincoln, 2011).

There are advantages and disadvantages of both qualitative and quantitative approaches. Following a solid review of the literature, I have combined these advantages and disadvantages, as shown in Tables 11, 12, 13 and 14. I will proceed to outline some of the advantages and disadvantages of qualitative, quantitative and mixed method approaches that I believe are of particular relevance to my study.

Table 11

Advantages of qualitative approaches	
Advantage (arranged alphabetically)	**Source**
Acknowledges multiple views	Barbour (2001)
	Blaxter et al. (2006)
	Davies and Hughes (2014)
	Devers and Franklin (2000)
	Holloway and Wheeler (2010)
	Marshall and Rossman (1999)
Dynamic and interactive	Blaxter et al. (2006)
	Davies and Hughes (2014)
Expresses reality	Amaratunga et al. (2002)
Looks at context and meaning	Barbour (2001)
	Brannen (2005)
	Davies and Hughes (2014)
	Holloway and Wheeler (2010)
	Marshall and Rossman (1999)

	Mertens (2015)
	Phillimore and Goodson (2004)
	Silverman (2005)
	Whittemore et al. (2001)
Researcher feels involved	Davies and Hughes (2014)
Results in richer data	Amaratunga et al. (2002)
	Devers and Franklin (2000)
	Holloway and Wheeler (2010)
Seeks breadth over depth	Blaxter et al. (2006)
	Marshall and Rossman (1999)
	Silverman (2005)
	Whittemore et al. (2001)

Table 12

Disadvantages of qualitative approaches	
Disadvantage (arranged alphabetically)	**Source**
Cannot use statistical analysis	Davies and Hughes (2014)
Data analysis is more complex	Amaratunga et al. (2002)
Does not need careful planning at the start	Devers and Franklin (2000)
Generates a lower volume of data	Amaratunga et al. (2002)
	Silverman (2005)
Less reliable and valid	Silverman (2005)
	Whittemore et al. (2001)
Less rigour	Barbour (2001)
Research involvement can be subjective	Barbour (2001)
	Blaxter et al. (2006)
	Devers and Franklin (2000)
	Holloway and Wheeler (2010)
	Whittemore et al. (2001)
Simplistic	Phillimore and Goodson (2004)
Time consuming	Devers and Franklin (2000)
Transcription time and cost	Devers and Franklin (2000)
	Wright (2005)

Table 13

Advantages of quantitative approaches	
Advantage	**Source**
Measure and analysis of data	Amaratunga et al. (2002)
	Devers and Franklin (2000)
	Feilzer (2010)
	Phillimore and Goodson (2004)
Researcher more objective as less personal involvement	Amaratunga et al. (2002)
	Blaxter et al. (2006)
	Murray (2003)
Use of statistics therefore easily replicable	Murray (2003)
Standardised and systematic	Silverman (2005)
Access individuals in distant locations	Wright (2005)
Faster data collection	Wright (2005)
Generalisable	Amaratunga et al. (2002)
	Brannen (2005)
	Blaxter et al. (2006)
	Silverman (2005)
Larger sample size used	Blaxter et al. (2006)
	Silverman (2005)
More objective	Blaxter et al. (2006)
	Whittemore et al. (2001)

Table 14

Disadvantages of quantitative approaches	
Disadvantage	**Source**
Context of study ignored	Barbour (2001)
	Brannen (2005)
	Holloway and Wheeler (2010)
	Mertens (2015)
	Phillimore and Goodson (2004)
	Whittemore et al. (2001)

3.3.1 A qualitative approach

A qualitative approach to data collection can be defined as activities that aim to interpret practice and make sense of meanings: examples of these activities could include observations, interviews, focus groups or questionnaires (Denzin & Lincoln, 2011). Robson (2002) explains how the interpretation of qualitative findings are deduced through logic; however, the interpretation of the data obtained as a result of the activities mentioned has the potential to be open to bias. The nature of such activities can give the research the opportunity to get closer to the truth than with a purely quantitative approach (Denzin & Lincoln, 2011). Truth in research has been deemed to have been found through "a combination of experiences and reasoning" (Cohen et al., 2011, p. 4). Having awareness of one's own inclination to bias can help overcome the potential limitation of a qualitative approach. Detail of my identified bias is discussed in Section 3.7 in relation to my chosen methods of data collection.

A disadvantage of utilising a qualitative approach can be the increased time taken to collect and then analyse the data. Although this might seem an unimportant disadvantage associated with the qualitative approach, it was in fact relevant to this study. If an interview or focus group is undertaken, it is usually recorded; these recordings then need to be transcribed, either in part or verbatim. The time taken to do this transcription can be considerable. Transcription services are available but the costs of these need to be considered against the time and accuracy of doing so oneself. In addition, the distribution of postal questionnaires

can be costly, with the researcher often paying outward and return postage, and time is also spent waiting for responses to be returned (Denscombe, 2014).

Once data has been collected, analysis needs to be undertaken. The time taken to analyse qualitative data can be considerably greater than quantitative analysis. Software packages such as IBM SPSS Statistics (formerly SPSS) can be used for quantitative analysis, and NVivo^{TM} for qualitative. These approaches are available to aid in data analysis and can facilitate a more timely analysis. Use of these software packages assumes that the researcher is familiar with the use of the software package in the first place, or else she will have to take additional time in order to familiarise herself with them prior to use (Cohen et al., 2011).

 If the use of software packages to aid qualitative analysis is not undertaken, then a thematic analysis can be an alternative approach. A thematic analysis involves the categorisation of the data into subgroups. This is a recognised, acceptable method of analysis but there are potential concerns. The person undertaking the categorisation is the one who makes the decisions about what they consider pertinent and how themes are grouped (Robson, 2002). These decisions might be different if another individual were to undertake the analysis, and even the same researcher on a different occasion might categorise differently, thus potentially leading to different outcomes and conclusions. A potential solution to overcome this bias might be to have more than one person undertake the analysis and then the categorisations are compared and contrasted. A statistical test such as Cohen's kappa can be a means of comparing agreement statistically so the potential bias can be further eliminated by its use. Whilst this might lead to more objective and reliable outcomes, it will be more time intensive. Having briefly outlined some of the disadvantages of qualitative methods, their advantages cannot be underestimated.

The findings born out of qualitative data analysis are constructed on real life experiences, capturing an individual's viewpoint, so can lead to rich, deep findings (Amaratunga et al., 2002; Holloway & Wheeler, 2010; Devers & Franklin, 2000). These findings then need to be articulated in a clear unambiguous manner, in order to allow the reader to make sense of the interpretations formulated.

3.3.2 A quantitative approach

The data generated through quantitative methods is usually numeric in nature, thus facilitating the use of statistical tests to draw conclusions. Inferential statistical tests can look

for similarities and differences between sets of data with the use of IBM SPSS Statistics or similar, which in themselves have strengths and weaknesses as mentioned above. Results can be presented in graphical form and, if a suitable graphical representation is chosen, this can aid presentation. Conversely, if an alternative graphic is chosen, it may hinder the clarity of the presented results. This statistical underpinning led to quantitative methods being viewed as more scientific (Robson, 2002, p. 17).

However, the use of statistics that have been used incorrectly or manipulated can give false reassurance about the findings (Robson, 2002). Using an inappropriate statistical test, or errors in data entry can lead to incorrect results. This is a definite disadvantage, since the honesty and accuracy of the researcher is relied upon, as with qualitative research.

In order to test the credibility of results, another researcher may wish to repeat them to ascertain if they can achieve the same results. This has been said to be more feasible in – and consequently a benefit of – a quantitative study, where the experiment or test can be repeated under the same conditions to give the same result (Denscombe, 2014). However, qualitative data collection methods can also be replicated. An interview, focus group or questionnaire can be repeatedly undertaken with other groups to confirm or refute findings.

3.3.3 A mixed methods approach

Having now outlined some of the advantages and disadvantages of both qualitative and quantitative methodologies, I return to the earlier statement made: there is no right or wrong methodology, any can be used as long as there is a clear and full justification. Robson (2002), Hart (2005), Denscombe (2014) and Plowright (2011) all make this claim in different guises. They further add that current thinking is that one does not have to definitively choose between qualitative and quantitative methodologies; this is where the mixed methods methodology can be utilised. Johnson et al. (2007) claim that whilst qualitative and quantitative methodologies have been in regular use since ancient Greek times, the newer mixed methods approach should be considered in equal standing to both qualitative and quantitative methodologies, as all three have valuable perspectives. Following on from the claim that all three paradigms are equal, Johnson et al. (2007, p. 124) later somewhat contradict this themselves by providing a diagram that shows the three methodologies on a continuum, as shown in Figure 3.1.

Figure 3.1 – Three major research paradigms (Johnson et al., 2007)
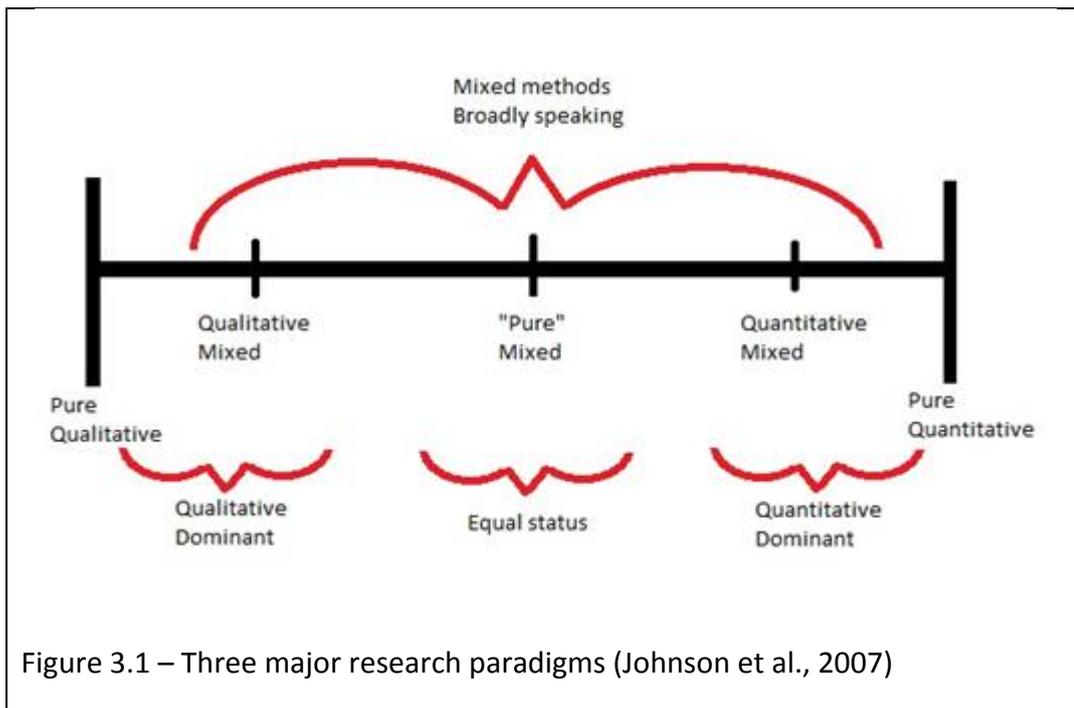
Interpreting Figure 3.1, mixed methods is actually the largest realm of research, so should it be given greater standing than either qualitative or quantitative? Although I am defining my current research as mixed methods, if using this diagram as a guide, it would be characterised as qualitative mixed as the qualitative part of my study; the semi-structured interviews is the largest feature. This is supported by use of questionnaires, the findings of which are presented using descriptive statistics resulting in a quantitative slant.

Mackenzie and Knipe (2006), along with Johnson et al. (2007), claim that a mixed methods approach is the perfect solution as it makes use of the best parts of both qualitative and quantitative methodologies. Johnson et al. (2007) later contradict their own claim. In the early part of the article they make mention of perfection, but towards the end they detail weaknesses of the mixed methods approach, offering a mixed opinion.

Blaxter et al. (2006), Marshall and Rossman (1999), Silverman (2005) and Whittemore et al. (2001), and all make reference to the benefit of mixed methods in its rich data and deep analysis; however, a mixed methods data collection which is not undertaken well or is analysed poorly will not lead to a rich, deep discussion. This cannot be called an advantage unless this is put into the context of how and by whom the analysis is undertaken (Johnson et al., 2007). They claim that mixed methods allows new ways of thinking to take place, but

unquestionably it is not the method that stimulates and promotes thinking in a certain way. Spending time analysing either qualitative or quantitative data could also prompt the researcher to think in a new way: as a result this leads me to question that part of the study of Johnson et al. (2007). One of the weaknesses Johnson et al. (2007) mention is that when two data collection methods are utilised, there is the possibility that two differing and contradictory results might be obtained. They do not, however, offer any suggestion as to how to deal with such situations.

Utilisation of the mixed methods approach is presented by Blaxter et al. (2006, p. 84) as a means of "gaining a more detailed perspective on some of the issues raised". Using a questionnaire following interviews, or vice versa, means a mixed methods triangulation.

3.3.4 Triangulation

Undertaking two different data collection methods is a form of triangulation and is a way of validating findings, with similarities or differences (Denzin & Lincoln, 2011). Triangulation makes the assumption that "the use of more than one method will confirm the validity of the concept" (Hart, 2007, p. 349). The main benefit of a mixed methods approach, which prompted it to be the methodology of choice for my research, was undertaking both interviews and questionnaires and the subsequent opportunity to triangulate the results. Triangulation in its simplest form is defined as "using two or more data collection methods in the study of some aspect of human behaviour" (Cohen et al., 2011, p. 194). Therefore, my use of interviews and questionnaires allows the term "triangulation" to be assigned to it. By examining one area, mentoring, from the perspective of more than one group, mentors and mentees, and subsequently comparing and contrasting the results, a more holistic view is reached. This leads to results being less biased and more reliable, with increased confidence in the findings than the viewpoint of only one individual group (Cohen et al., 2011). The findings are less likely to be inconclusive or accidental. Triangulating data will show two viewpoints which either agree and therefore support, or disagree with each other and thus uncover hidden variables or bias. When the two viewpoints differ then, the conclusion that can be drawn is that there is no consensus.

Whilst the papers mentioned so far are steadfast in their positive thoughts towards mixed methods, Preskill (cited in Johnson et al., 2007, p. 121) explains that a real benefit of mixed methods is that it acknowledges that it does, along with all other methodologies, offer bias

and weaknesses and that, so long as these are recognised, the potential biases can be overcome and the weaknesses limited.

Within qualitative research there are further choices of approaches to be taken; I will now proceed to explain these.

3.3.5 Ethnography

The definition of ethnography, as provided by the Oxford Dictionary, as a "description of peoples and cultures with their customs, habits and mutual differences" (Oxford English Dictionary, 2017), is almost identical to the definitions provided by Denscombe (2014), Cohen et al. (2011) and Robson (2002). Denzin and Lincoln (2011) take the definition further by including mention of a study of the broader range of applications, including investigating beliefs but – more crucially – that the observations take place over an extended period of time. Robson explains how an ethnographic approach is better suited to a study of "a social group" (Robson, 2002, p. 186). My initial exclusion of an ethnographic approach was firstly due to the group study notion. It might be argued that I could have a group of mentors and a group of students; however, the aim of this study is to explore the individual experiences of students rather than their collective experience as a group or cohort of students.

Studies that involve the direct observation of participants are classified as ethnographic. Observational ethnographic studies have been described by Plowright (2011) and Denscombe (2014) as having a tendency to be deceptive or covert. Given the majority of interactions between the mentors and students in my study take place within a hospital environment during a patient examination, there would be ethical considerations to take into account in planning a study which involved me being present during an examination in order to observe the mentor/student relationship.

If I had observed the interaction between the mentor and student directly, I may not have gained a true perspective of their relationship and interactions, due to their reactivity while being observed. The notion of reactivity whilst being observed is an element of the Hawthorne effect being evident (Shipman, 1997). The term *Hawthorne effect* was first mentioned by Landsberger in 1958, following a factory study in the town of Hawthorne, Illinois, where a temporary increase in workers' productivity was noticed when they knew they were being observed. Landsberger's study concluded that people behave differently when they know that they are being watched (McCambridge et al., 2014).

Since I did not intend to undertake any direct observational data collection of the relationship and interaction between mentors and students, this led me to further discount an ethnographic approach.

3.3.6 Case study

A case study approach, as simply defined by Denzin and Lincoln (2011, p. 311) is a "detailed examination of a single example". As an approach, case studies are often used in the preliminary or pilot stages of a larger study; however, there are many misunderstandings of their choice as a methodological design, leading them to be held in low regard and often disregarded within current research design (Denzin & Lincoln, 2011).

It was proposed by Clough and Nutbrown (2012) that in research one should consider giving the participants a voice: a case study approach is one means of facilitating this. Whilst a case study approach can be effective in many types of study, it is most effective with participants who are too young, old or vulnerable to undertake alternative data collection methods (Clough & Nutbrown, 2012). The participants in my third stage study did not fit the demographic of being old, young or particularly vulnerable, therefore were able to articulate their thoughts and feelings through either the questionnaire or the interview. Each interview could be written and presented as an individual case study; however, I chose not to adopt this approach as I wished to gain a more holistic view rather than a set of isolated accounts.

A benefit of using a case study approach is that a great depth of information can be obtained from participants. This is contrasted with the smaller resultant sample size obtained, sometimes only one or two, leading to the definition that a case study is an intense focus on one thing (Denscombe, 2014; Plowright, 2011).

Denzin and Lincoln (2011, p. 302) identify five common misunderstandings regarding using case studies: these are shown in Table 15.

Table 15

Five misunderstandings of case study research
(Reproduced from Denzin & Lincoln, 2011, p. 302)

1. General, theoretical knowledge is more valuable than concrete case knowledge.

2. Once cannot generalise on the basis of an individual case, therefore the case study cannot contribute to scientific development.

3. The case study is most useful for generating hypotheses; that is, in the first stage of a total research process, while other methods are more suitable for hypotheses testing and theory building.

4. The case study contains a bias toward verification; that is, a tendency to confirm the researcher's preconceived notions.

5. It is often difficult to summarise and develop general propositions and theories on the basis of specific case studies.

One reason for not choosing solely a case study approach was the thought that I had to choose a single situation to focus on for the data collection; I thought that this would limit the breadth of my study and give less transferability to the findings. I later realised that this was one of the five common misunderstandings of the methodology explained by Denzin and Lincoln (2011). This does contradict the work of Denscombe (2014, p. 64) who asserts that the case study approach is "vulnerable to criticism in relation to the generalisability of findings", or it could be that Denscombe (2014) has also misunderstood whether Denzin and Lincoln (2010) are to be believed.

Despite these misunderstandings, case studies can provide a depth of data and a deep understanding of the subject being investigated and so more than one case study has been used to build up data to contribute to answering an overall research question. Whilst initially

disregarded, it could be said that each of the student interviews undertaken for my main study could be viewed as an individual case study approach, leading me to now add an element of case study to my *bricolage* approach.

3.3.7 Phenomenology

A phenomenological study looks at "direct experiences taken at face value" (Cohen et al., 2011, p. 18). This definition is expanded upon by Denscombe (2014, p. 94) who describes the approach as "using description, subjectivity and interpretation to make sense of the data". These terms align with the structure of my main study, hence the adoption of some aspect of phenomenology within my chosen patchwork of methodologies. The phenomenology concepts have many elements that align with my main study presented in Chapter 6, as I investigated direct experiences which were taken at face value. The mentors and students in the main study all had direct experience of mentoring. Therefore, phenomenology seemed an appropriate approach as it does not normally appear to relate only to current experiences. This is deduced from the fact that reflexivity is seen as an integral part of it and involves looking back on what has happened previously and seeking meaning from it (Clough & Nutbrown, 2012; Cohen et al., 2011).

Phenomenology is also said to include an element of self-fulfilling prophecy, which is a factor sometimes encountered within mentoring (Appelbaum et al., 1994). If someone received poor mentoring themselves, they may exhibit these practices in their own subsequent role as a mentor. In a similar way, if colleagues exhibit either poor or good mentoring, other staff may copy their practices and perform in the way they see being demonstrated amongst others. During the mentor training which I provide to support mentors, a reflection exercise is undertaken with subsequent discussions. It is during this time that I have observed many mentors recognise this self-fulfilling prophecy factor. Some of the mentors report this reflection as a shock and 'wakeup call' to change their mentoring practices.

A criticism of phenomenology is that it does not always consider the intentions of others, but being aware of this potential limitation is the first step in overcoming it.

Now that the chosen approaches have been explained, the methods used to gather the data will be explored.

3.4 Defining my *bricoleur* approach

The French word *bricoleur* directly translates into English as "handyman" (Oxford Essential French Dictionary, 2010). *Bricoleur* has been used within research terminology since the 1960s, evolving into a slightly different definition over time. Hammersley (2008) describes a *bricoleur* as someone who is an amateur with a variety of tools at their disposal, and Denzin and Lincoln (2011) describe *bricoleur* as a patchwork approach, borrowing different ideas from different paradigms and disciplines and then fitting them together to make a unique approach. The mention of tools by Hammersley (2008) has led the *bricoleur* approach to be likened to a toolbox approach: there are many tools available and you select the best one for the job in hand. However Denzin and Lincoln's (2011) idea of being an amateur patchworker resonates with me more than the toolbox analogy. This is due to my incorporating thinking from the traditional scientific research background into the educational research world, intertwined with health research. Just as the shapes which make up a patchwork quilt can either appear randomly thrown together or carefully selected to complement each other, these three areas of science, health and education can blend seamlessly with each other when care is taken to adopt the right combination of tools. The patchwork can also clash if not enough thought is given to the selected combinations. Similarly, thought needs to be given to the research approaches selected in order to ensure they complement each other.

When developing a patchwork in sewing, one starts in the middle and builds shapes in a circular pattern outwards as shown in Figure 3.2. This pattern was used to develop Figure 3.2. A combination of nouns and adjectives are presented in an alphabetical manner to describe the *bricoleur* approach that I've taken. Incorporated within are elements of a variety of different paradigms and approaches that will now be explained and are represented visually in Figure 3.3
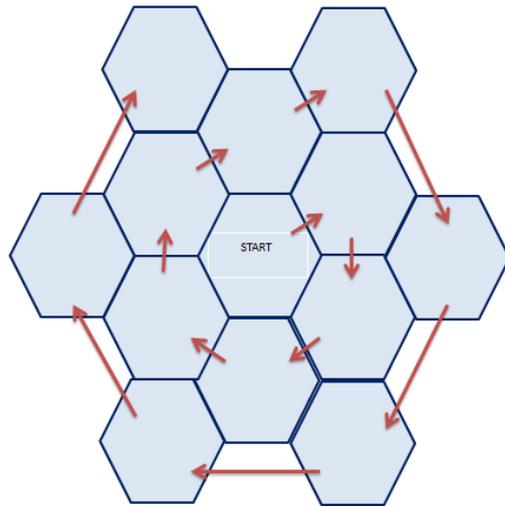
Figure 3.2 Pattern of development
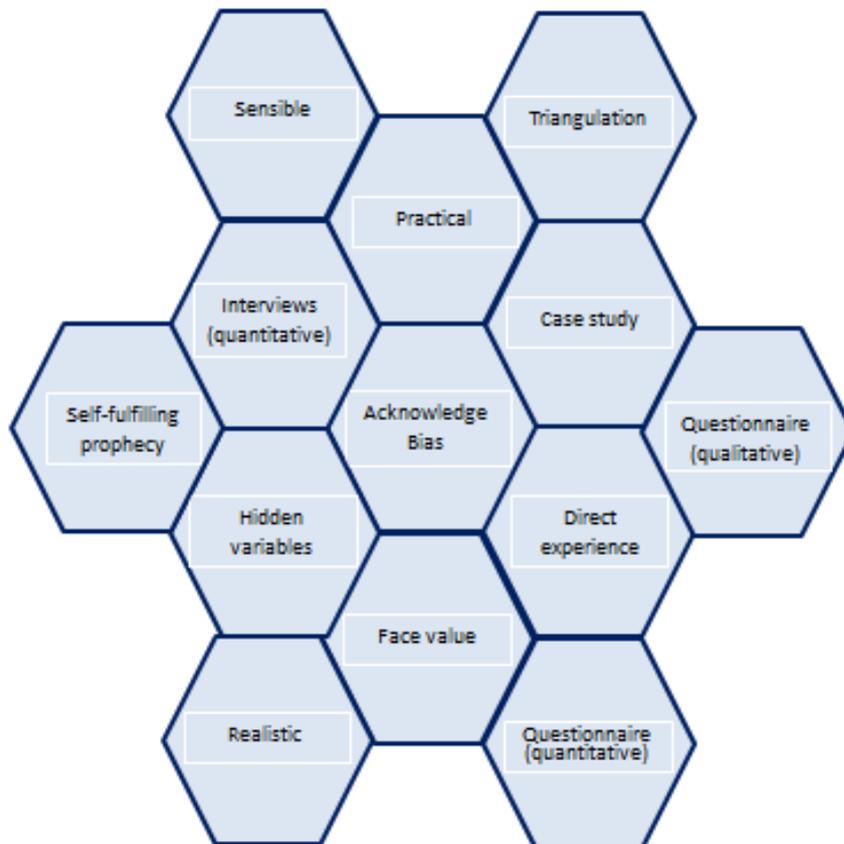
Figure 3.3 – My *bricoleur* patchwork

As defined in Section 3.2.3 the pragmatist is someone who deals with things sensibility, realistically and practically. These words can be used to describe me and my approach to many aspects of my work and life and thus were applied within the *bricoleur* nature of this research study. As the pragmatic philosophy also lends itself to the mixed methods approach it was included within my philosophical approach.

From the post positivist stance, the element which I incorporated into my *bricoleur* approach was the consideration of the amount of hidden variables and unidentifiable bias that might be present in that data collected. These were acknowledged where possible and steps taken to eliminate.

The next element of my *bricoleur* patchwork contributes to the data collection methods and utilises the questionnaires in the Pilot and Main studies to provide qualitative data and quantitative data. Alongside quantitative data obtained from the interviews in each of the three studies undertaken.

Within the main study, responses to the same questions from mentors and students were compared and contrasted as a means of triangulation to my *bricoleur* patchwork. Whilst a case study approach was initially disregarded as explained in Section 3.3.6 it could be said that each mentor/student pair could be an individual case study, however this would rely on gained responses from both mentor and corresponding students. Instead, this research study can be defined as a case study based on the ultrasound course at this University, and thus is included as seen in Figure 3.3

The phenomenological paradigm contributed a number of elements to my *bricoleur* approach. The interviews and questionnaires used to collect the data throughout investigated direct experiences of mentor and students which were taken at face value, hence these terms are included in my patchwork. Phenomenology makes mention of a self-fulfilling prophecy, a concern that was evident and needs acknowledgment within this study.

Having now outlined the elements which contributed to my *bricoleur* approach, I will now proceed to detail the specifics of the data collection selected for inclusion within the three studies which make up this piece of research.

3.5 Choice of data collection methods

The data for this overall piece of research was collected in three stages. Stage one was the exploratory study, which involved gaining a wider perspective regarding mentoring practices from representatives from other Health programmes within the School of Health and Social Work. Interviews were the data collection method used during stage one. The data analysis, findings and discussion regarding this stage of data collection is presented in Chapter 4. The second stage of data collection was the pilot study. A small group of students were interviewed individually and questionnaires were sent to their mentors. The pilot study is written in up Chapter 5. The third and final stage of the research was the main study, which involved interviewing students at the end of their course. Questionnaires were simultaneously sent to their mentors. The data analysis of the main study, along with the findings and discussion, are presented in Chapter 6. Throughout the three stages of data collection, interviews and questionnaires were chosen.

I now present the reason for selecting these data collection methods. After which, a descriptive step-by-step guide is presented, outlining how they were performed. An element of reflexivity will be incorporated along the way, detailing my learning from each stage of data collection.

3.6 Interviews

As with all data collection methods there are numerous associated advantages and disadvantages reported. These have been amalgamated into Tables 16 and 17. A selection of these advantages and disadvantages deemed pertinent to my study are then discussed.

Table 16

Advantages of interviews as data collection method	
Advantage (arranged alphabetically)	Source
Allows probing/prompting for answers	Blaxter et al. (2006)
	Fowler (2002)
Better explanation of purpose compared to questionnaires	Oppenheim (1992)
Build rapport with respondents	Fowler (2002)
	Oppenheim (1992)
Can choose to focus on body language if video record	Blaxter et al. (2006)
Can modify questions in light of responses	Blaxter et al. (2006)
Generalisable results	Blaxter et al. (2006)
Greater richness	Oppenheim (1992)
Improved response rates	Blaxter et al. (2006) Oppenheim (1992)
Large amounts of data	Marshall and Rossman (1999)

Less misunderstanding of questions	Oppenheim (1992)
Longer survey possible than any other type	Fowler (2002)
More valid – as 'seen' respondent	Oppenheim (1992)
Most effective means of getting cooperation	Fowler (2002)
Open-ended questions can be asked	Oppenheim (1992)

Table 17

Disadvantages of interviews as data collection method	
Disadvantage (arranged alphabetically)	Source
Coding of data takes longer than statistical analysis	Marshall and Rossman (1999) Oppenheim (1992)
If take notes in front of interviewee can be distracting and they can read into it if you do or do not make note of response	Blaxter et al. (2006)
Interview effects/bias	Marshall and Rossman (1999)
Long data collection period if face-to-face	Fowler (2002)
More costly than questionnaires	Fowler (2002)

	Oppenheim (1992)
Recording could make respondent hesitant or anxious	Blaxter et al. (2006)
Requires staff training	Fowler (2002)
	Oppenheim (1992)
Respondents may not be truthful	Marshall and Rossman (1999)
Time to transcribe	Blaxter et al. (2006)
Too much rapport can lead to 'joking' and not taking seriously	Oppenheim (1992)
Unnatural situation	Blaxter et al. (2006)

3.6.1 Interviewer technique

One potential disadvantage of an interview is that an effective level of interviewing skill and technique is required by the interviewer (Denscombe, 2007; Fowler, 2002; Oppenheim, 1992).

When interviewing and unforeseen responses are received, they can be followed up immediately by the interviewer, through prompting or rewording (Blaxter et al., 2006; Fowler, 2002; Oppenheim, 1992). This can in turn lead to a greater depth of answer. The interviewer needs to ensure there is some standardisation to maintain comparability between interviews (Robson, 2002). This is reliant on the skill of the interviewer.

Denscombe (2007) explains how a questionnaire can be better than an interview when researching neutral subjects. My assumption was that there may be some sensitive issues raised during the data collection. A skilled interviewer could then sensitively probe and raise

issues in a way that could not be done in questionnaires. Whilst a respondent is free not to answer any question in both a questionnaire and interview, it could be easier to skip a difficult or sensitive question on a questionnaire, compared with an interview situation.

Qualitative approaches, and particularly interviews, can be advantageous when exploring someone's experiences and associated emotions (Denscombe, 2007; Plowright, 2011). This is one of the reasons they were included as data for my research. The semi-structured nature of interviews allows an overarching theme to be investigated, but also to be tailored to each student based on their individual responses and experiences (Blaxter et al., 2006; Robson, 2002; Fowler, 2002) Only an experienced interviewer can do this well.

3.6.2 Time limitations

Conducting the face-to-face interviews can take considerable time (Oppenheim, 1992, p. 97); however, I made the decision, due to the following considerations, that I would conduct face-to-face interviews."

The use of telephone interviews can be beneficial in overcoming some of the limitations of face-to-face interviews. The travelling time and costs to the research will be reduced (Robson, 2002; Polit & Hungler, 1997; Silverman, 2005). The first interview for the main study was undertaken over the telephone. I found myself constantly repeating myself and asking the respondent to do the same; the flow of the interview seemed stilted and unnatural. This reaffirmed my decision to conduct face-to-face interviews where possible. The sample of students for the main study were located throughout the UK and Ireland. To avoid travelling time and associated costs, interviews were conducted at the university, when the students were already in attendance. Although this method of interviewing takes time, Oppenheim (1992) says it is also very rewarding and, based on my interviewing experiences, I would agree.

3.7 Questionnaires

In the same format as the interview section, the advantages and disadvantages have been combined into Tables 18 and 19. A selection of these advantages and disadvantages deemed pertinent to my study will then be discussed.

Table 18

Advantages of questionnaires as data collection method	
Advantage (arranged alphabetically)	Source
Convenient	Marshall and Rossman (1999)
Data from wide geographical area can be collected	Oppenheim (1992)
Easy to administer	Blaxter et al. (2006)
Generalisable results	Blaxter et al. (2006)
	Marshall and Rossman (1999)
Larger sample size	Marshall and Rossman (1999)
Lower cost than interviewing	Blaxter et al. (2006)
	Fowler (2002)
	Oppenheim (1992)
Minimal staff and facilities needed	Fowler (2002)
No interviewer bias	Oppenheim (1992)
Standardisation	Blaxter et al. (2006)
Take place on neutral ground	Blaxter et al. (2006)

In Table 18, although Oppenheim (1992) advocates that there is no interviewer bias when collecting data with a questionnaire, this can only be correct if the questions are written in a non-biased manner.

Table 19

Disadvantages of questionnaires as data collection method	
Disadvantage (arranged alphabetically)	Source
Cannot correct misunderstanding	Oppenheim (1992)
Ineffective way of getting cooperation	Fowler (2002)
Lack depth	Blaxter et al. (2006) Marshall and Rossman (1999) Oppenheim (1992)
Low response rate, often less than 40%	Oppenheim (1992)
Need clear instructions	Fowler (2002)
Time taken waiting for responses to be sent back	Oppenheim (1992)

3.7.1 Overcoming disadvantages of questionnaires

Oppenheim (1992) comments that one of the main limitations of sending questionnaires via post is that a low response rate is often achieved. One will never get a 100% response rate (Crombie, 2003). Therefore, what needs to be decided is how much less than 100% is going to be acceptable. A response rate of less than 10% is considered to be inappropriate and to misrepresent the results (Bell, 2010). Differing response rates have been reported from different groups and via different methods.

Table 20

Varying response rates to postal questionnaires		
Author	Area/group	Response rate
Barclay et al. (2002)	Medically related – direct to named respondents	68%
Edwards et al. (2002)	Education related	23%
Edwards et al. (2002)	Medically related	32%
Sibbald et al. (1994)	Medically related – direct to named respondents	61%

The remit of this research could be classified as a combination of educational and medical, hence the authors' work presented in Table 20 was selected. It can be seen from Sibbald et al. (1994) and Barclay et al. (2002) that a higher response rate was achieved by sending directly to named participants. The participants in stage two and stage three of my research were sent questionnaires directly, hence a response rate above 60% was the target.

It is reported that questionnaires sent in the post tend to result in "lower response rates" Fowler (2002, p. 42) and one needs to "allow up to two months for return" (Fowler, 2002, p. 68). Given the potentially significant costs incurred with outward and return postage (Fowler, 2002) and the time (Oppenheim, 1992), I decided to distribute questionnaires electronically. This combines the named respondent issue mentioned above with minimising costs and return time. Emailing my questionnaires was possible as anonymity was not required and I had access to the email addresses of all respondents. This also meant that I could monitor returns and send reminders, as the use of reminders helped to increase response rates (Fowler, 2002; Oppenheim, 1992).

3.7.2 Pilot studies

The detail within responses has been reported to be lower with a questionnaire than with an interview (Bell, 2010; Blaxter et al., 2006; Marshal & Rossman, 1999; Oppenheim, 1992). To overcome this, careful wording of the questions is needed (Robson, 2002). The pilot study was useful in supporting question development. Conducting a pilot study can have multiple benefits. The researcher assumes that the respondents will understand the questions in the same way as themselves, and comprehension of the wording of the questions can be checked and subsequent alterations made if required (Fowler, 2002; Parahoo, 1997; Robson, 2002).

These changes increase the validity and reliability of the data collected (Parahoo, 1997). Validity and reliability were defined and discussed in Section 2.2.

When undertaking a pilot study, "as similar sample to the main study as possible" should be used (Oppenheim, 1992, p. 62). All elements should be piloted, including the minutiae of "the type of paper the interviewer writes notes on" (Oppenheim, 1992, p. 48). The process of data analysis can also "be practised" and refined (Marshall & Rossman, 1999, p. 147).

When disseminating the questionnaires for the pilot study, I included the following question within the email: "As part of the pilot process, if you have any comments regarding wording, understanding or ease of use of this questionnaire please can you let me know." No specific comments were received.

3.7.3 Open and closed questions

Closed questions allow the respondent to select their response from a number of provided options (Leung, 2001). The benefit of closed questions for respondents is that the time taken to complete the questionnaire is shorter than if open, free text responses are required (Hart, 2007; Leung, 2001). A disadvantage of closed questions is that respondents may feel compelled into giving answers that perhaps are not the same as if they had a free text response available (Burgess, 2001). Despite this, Fowler (2002, p. 62) claims that questionnaires are "best with closed questions". The advantage of closed questions for the researcher is that responses can be analysed in a relatively short space of time, particularly if the use of statistical software packages is employed (Leung, 2001).

Open questions are where respondents are asked to give responses in a free text format (Bell, 2010; Hart, 2007). This can be a disadvantage for the researcher if the writing is not legible. By sending questionnaires electronically, this potential hurdle was alleviated.

While there is traditionally no opportunity to get expansion or more detail on answers provided (Oppenheim, 1992), the fact that the questionnaires I sent were not anonymous enabled the possibility of follow-up phone calls or emails to gain clarification and expansion of answers, thus overcoming this limitation.

An advantage of open questions is that respondents can give a greater depth of response or fuller perspective to their answer (Polit & Hungler, 1997). Due to the nature of the data

required, this greater depth of answer was necessary, so most questions were open in nature. The inclusion of both open and closed questions allowed me to make use of statistical analysis for the quantitative data obtained from closed questions, and qualitative thematic analysis derived from the open style questions (Bell, 2010; Hart, 2007; Silverman, 2005).

3.8 Transcriptions

All the interviews within my research were audio recorded. Davies and Hughes (2014) explain how video recording can appear unnatural and could make respondents hesitant or anxious (Blaxter et al., 2006). These recordings subsequently needed transcribing which can be a "major time consuming task ... for every hour of interviewing it can take three hours to transcribe" (Denscombe, 2007, pp. 203 & 278). There are a variety of available options for transcription. The transcription could be undertaken by myself as the researcher or by employing an external reputable transcription company. Denscombe (2007) suggests that one can only become really familiar with the data during the transcription process.

Two methods of transcription were utilised during the first stage of the study. Firstly, the use of Dragon NaturallySpeaking as a software dictation programme was used. Secondly, direct typing from the audio recording was undertaken. The use of Dragon NaturallySpeaking software proved difficult as only one voice can be recognised, resulting in a partial and incorrect transcription. When typing directly from the audio it was found to be even more time consuming, and significant editing was still required to tidy up the recording into sentences and remove pauses and stutters (Denscombe, 2007). This difficulty in tidying up of the transcript was compounded by my dyslexia, as I was unable always to recognise my errors and mistakes.

From listening to the audio recordings and reading the transcripts that I performed, flaws in my interview technique were noted. A longer time needed to be given for respondents to reply and I should not have moved onto the next question so quickly. This learning was applied to the interviews undertaken during the second stage and main study.

For the second stage and main studies, use of an external transcription service was employed. As well as being a time saving method, accuracy was guaranteed and checked carefully from listening back and reading the transcripts closely.

3.9 Bias

As mentioned in Section 3.3, both qualitative and quantitative approaches to data collection and analysis can have the potential to include bias. The post positivist philosophy is said to be able to put aside one's personal opinions and avoid subjectivity in order to find the truth within data (Denzin & Lincoln, 2011). However, within life we make many assumptions based on one's upbringing, beliefs and previous knowledge, some of which turn out to be true and some not; consequently, similar assumptions are made within research decisions. The decisions I have made regarding the conduction of my research has been shaped by my past and, knowingly or otherwise, this could bring potential bias into my data analysis. Measures needed to be taken to ensure I recognised and, where possible, overcame any bias evident. Some of the recognised anti-bias strategies to overcome this will now be detailed.

The sampling method that I used could have had the potential to introduce bias if steps were not taken to minimise this. As part of my role within student and mentor support, I was already aware of certain issues and challenges that have occurred within mentoring relationships. I made the assumption that those who had not made me aware of problems with their mentor had no issues, when actually they could have had either very good or bad experiences that I was unaware of. To limit this potential bias, all students (n=11) from the 2014 intake were invited to take part in the interviews.

While being the one to undertake the interviews might have introduced bias, I needed to be mindful to maintain neutral tone and body language during the interviews, so as not to lead or influence the participants. This is something that came with practice and also by listening back to audio recordings objectively and analysing my input, in order to reflect and learn from my conduct. The use of a standardised introduction and the same conditions was another approach taken to introduce consistency and therefore reduce potential bias.

The final element of potential bias that I identified was that of my own mentoring experience while I was a student. I had a far from harmonious relationship with my mentor and did not enjoy my training. Albeit 15 years ago, I needed to be conscious not to let my personal experiences cloud my judgment during the interview or analysis period.

3.10 Ethical considerations

Ethical approval was sought and gained at all stages of this programme of study. Copies of the approval paperwork can be found in Appendix A. There are said to be four principles of ethics, respect for autonomy, non-maleficence, beneficence and justice (Beauchamp & Childress 2001). Gillon (1994) suggested that regardless of one's philosophical approach, the four principles of ethics are applicable. The application of each of these principles in relation to this study will now be considered.

To give one's participants autonomy means to communicate with them regarding the research being undertaken and to allow them to make their own decision as to if they consent to taking part (Gillon 1994, Mason & McCall Smith 2000). For the exploratory, pilot and main studies a participant information sheet was provided alongside the invitation to take part to facilitate the decision making of the participants. This University along with my past and present colleagues may also be regarded as participants in the study. Given that an investigation was conducted into the current and historic mentoring practices and student support, their autonomy also warranted consideration. Therefore written consent was gained from the Dean of the School to investigate this area of practice in order to allow the staff and students to be invited to participant for the purposes of this research.

The ethical principles of non-maleficence and beneficence are often considered in tandem as they consider the potential benefits of taking part in research alongside the desire to not cause harm by participation. The staff, student and mentor participants may not directly benefit from taking part in this study, however involvement may increase awareness and interest in mentoring, which may in turn lead to a benefit to any potential mentees of participants. Mason & McCall Smith (2000) also details beneficence to be not withholding information and presenting the truth. This is one reason for direct quotes from participants being included within the results sections for each relevant chapter. All responses from participants were included within the analysis so as to further abide by the principle of beneficence. In order to ensure no harm (non-maleficence) was caused to participants their anonymity was maintained throughout, this included not directly naming this University so as to preserve the integrity of the ultrasound programme for past, present and future students. The ultrasound programme recruits from all over the UK and Ireland within the NHS and private sectors. There

are over 230 NHS Trusts within England (NHS 2017) and 48 Public hospitals within Ireland (HSE 2017) and many more private facilities therefore it is not possible to link my participants to their workplaces, therefore no harm can be caused by any responses received thus ensuring non-maleficence was preserved.

The principle of non-maleficence was also considered in relation to not doing harm to patients. When during an interview, an area of concern regarding potential patient safety was identified, this was followed up by myself outside of the interview setting with both the student and their mentor. I was confident that no harm was caused to patients after clarification of the situation.

The final principle of ethics considered is that of justice. This was integrated into this study through the equality given to each participant along with a fair representation of all responses received. Whilst conducting the interviews for the exploratory, pilot and main studies I took great care as the researcher to maintain neutrality and not to impose my personal views regarding mentoring during the interviews, this also supported the principle of Justice according to Gillon (1994).

3.11 Insider research

Following on from Sections 3.9 on Bias and Section 3.10 on Ethical considerations there needs to be mention of insider research. Greene (2014) comments that regardless of whether someone is acting as an insider researcher or not, the methodological considerations are often similar, hence its mention at this stage, after the detail of methodological choices has been outlined. Insider research can introduce bias and has ethical considerations also as will now explained, alongside considering the positive elements of insider research.

Insider research is defined by Greene (2014) as 'research conducted within a group or organisation of which the researcher is also a member'. Relating to this piece of research, the group would be the cohorts of ultrasound students and their mentors, within the organisation of this University. Whilst I am not strictly a member of the 'group' I do have interaction with and potential power over all members of the group.

Cheung-Judge (2012) link the insider researcher to the phenomenological approach in that they argue that whilst some elements of our personality can be modified or adapted to suit

different situations or groups, as is required for unbiased research, there are other elements of ourselves that are 'hardwired' within us and represent our 'true self' which we might not be able to identify, and thus can introduce bias to a study if they are not recognised.

Being an insider researcher, a role I adopt during this piece of research, I have an element of power over the respondents which needed to be addressed. Cheung-Judge (2012) advise that this power element needs to be recognised, and more importantly, recognition of the emotions or actions which might trigger a reaction in myself and then one should develop strategies to manage this power dynamic.

There are both advantages and limitations to being the insider researcher. My extensive understanding of the ultrasound profession and programme along with the requirements of both students and mentors allows for a greater depth of questioning during the interviews than had a third party been employed to conduct the interviews. This familiarity I have with the profession and the programme could mean assumptions are made or that I might lose some objectivity when analysing the data (Greene 2014 & Unluer 2012). According to Greene (2014) the familiarity that the insider researcher has with the participants, the more natural the interaction between them will be and the less likely the research will be to pass judgment when compared to the non-insider researcher. All students in the 2014 were invited to take part in interviews as part of the main study, given the 100% response rate it is thought this is in part can be attributed to the familiarity between myself and the students, this level of access to students and mentors was a benefit of insider research. Therefore the sample size benefited from having an insider researcher. However it is acknowledged that as the response rate cannot be compared to if a non-insider researcher had been conducting the interviews the potential benefit is unsubstantiated. Both Greene (2014) and Unluer (2012) cite bias as a potential limitation of insider research however Greene does also identify the bias as a potential benefit, the level of insight an insider research has may allow them to question respondents to a greater depth.

In summary, by being the insider researcher there was potential for advantages and limitations with bias contributing to both. Regardless of whether the researcher is an insider or not the ethical principles discussed in section 3.25 must be adhered to.

3.12 Chapter summary and outline of following Chapters

Having outlined the rationale behind the choices of my underlying methodology in this chapter, along with providing the foundations for the different data collection methods selected, in the following chapters I will detail the studies that were undertaken.

An exploratory study was undertaken to explore the understanding of the term mentor across a variety of healthcare profession and to gain insight into the role of the mentor or equivalent and the training provided for them. The results of this study helped in answering research question 1 by identifying guidelines and support mechanisms available that may be shown to be effective in helping colleagues and students in mentoring practice. The findings of this study, presented in Chapter 4 identified that different professions have different understanding of the term mentor, hence promoting the expansion of the literature review in Section 2.17. This expansion of the literature review provoked increased thinking about the relationship between the mentor and the student. It was also identified in the exploratory study that mentors are allocated differently across the professions. The pilot study was subsequently designed to explore the relational nature of the mentor/student relationship along with investigating allocation of mentors specific to ultrasound department. The pilot study findings informed the answers to research question 2, the factors that may influence the relationship between the mentors and students. Reflections on the pilot study informed the changes to the main study as are detailed in Section 5.8. The main study also sought to explore the relational nature of the mentor/student liaison to a greater depth, considering hierarchy of importance of characteristics of a mentor and to ask both mentors and students to consider issues from their own and each other's perspectives. The findings of the main study aided in answering all three research questions, the specifics of which part of the study and their correspondence to the research questions are detailed the corresponding chapters.

4. The Exploratory study

4.1 Introduction

This chapter explains the detail of the exploratory study. The aims of the study will be presented, and then the detail of the methods is provided. The findings of the study will be described and then discussed. This chapter concludes with reflections on this exploratory study and how it subsequently informed development of the pilot and main studies. The exploratory study contributed to the answers for research questions 1 & 2.

1. What guidelines and support mechanisms may be shown to be effective in helping colleagues and students in mentoring practice?
2. What factors may influence the relationship between the mentors and mentees?

4.2 Aims of the exploratory study

The aims of the exploratory study were threefold. Firstly, it allowed me to explore, through semi-structured interviews, the mentoring and supervision practices of other health programmes within the School of Health and Social Work at this University. I use the terms *mentoring* and *supervision* here because one of the areas investigated was the use of the word *mentor* and its different applications and meaning applicable to each professional group.

Secondly, I was able to identify similarities and differences between the aforementioned health programmes, and these were compared to the ultrasound programme. Responses were analysed in relation to whether mentoring practices were comparable with, or differed from, the evidence base regarding mentoring and supervision discussed within the literature presented in Chapter 2.

Finally, this exploratory study facilitated the opportunity to undertake a small scale study within my area of practice. I was then able to reflect critically upon this study and proceed to the development of a strategy for designing the pilot and main studies.

4.3 Background

The initial literature review drew attention to the fact that many of the mentoring practices employed within the ultrasound programme at this University did not compare with the findings in the literature. Having identified, as early as 2012, disparities within ultrasound practices at this University when compared to literature, it was considered crucial to investigate the remit of mentoring further. The programmes for this study were selected from within the School of Health and Social Work. The reason that those programmes were selected

was because they produce graduates, who on completion would be qualified healthcare professionals. More specifically, their students were learning a new skill as opposed to developing an acquired skill to a higher competency level. This approach was selected to include programmes that were similar to the ultrasound programme. Although useful information could have been obtained from programmes with different structures and requirements, equivalence with the ultrasound programme was required in this instance.

4.4 The semi-structured interview approach

The advantages and disadvantages of collecting data through semi-structured interviews has been presented in Chapter 3. This section will describe in detail the methods used.

4.4.1 Sample population

It was recognised that there are other programmes within this University whose students attend placements. However the practices within non-health courses, such as in the Schools of Education and Business, would be unlikely to have the same underlying principles as the health programmes regarding mentoring. Thus, results from these disciplines might not be directly comparable or relevant to this study. Conversely, by excluding non-health students it is possible that some areas of good practice that could be discovered from others may be missed.

The inclusion criteria for the exploratory study were:

- Programmes within the School of Health and Social Work at this University
- Programmes where students include an element of a clinical placement within a hospital or clinical setting, remote from the university
- Programmes where successful students are eligible for registration with the Nursing and Midwifery Council (NMC) or the Health and Care Professions Council (HCPC)
- Programmes where students learn a new skill rather than develop an existing skill

Both undergraduate and postgraduate courses were included. Despite the slightly different nature of the clinical placements, there were some useful parallels to be learnt from each group.

A potential sample of 22 programmes was identified. I aimed to choose programmes with as many similarities to the ultrasound programme as possible. Ultrasound education for

sonographers in the UK is undertaken at Masters Level, and applicants must have a first degree in a health-related subject (BMUS, 2017). In reality, this means that although these students are qualified healthcare professionals, they are learning a new skill as opposed to developing an already acquired skill to a higher level. Some of the postgraduate programmes originally considered for inclusion in the exploratory study were therefore excluded, as those students were developing an existing skill set – it was thought that the mentoring of these programmes would not be directly comparable to ultrasound. Therefore, the following 14 programmes met the inclusion criteria for the exploratory study:

1. Diagnostic Radiographer (undergraduate)
2. Diagnostic Radiography (assistant practitioner)
3. Therapeutic Radiographer (undergraduate)
4. Diagnostic Ultrasound (postgraduate)
5. Radiotherapy (postgraduate)
6. Physiotherapy (undergraduate)
7. Dietetics (undergraduate)
8. Paramedic Science (undergraduate)
9. Midwifery (undergraduate)
10. Adult Nursing (undergraduate)
11. Child Nursing (undergraduate)
12. Mental Health Nursing (undergraduate)
13. Learning Disability Nursing (undergraduate)
14. Social Work (undergraduate)

4.4.2 Selection and recruitment of participants

The next consideration was to identify a set of participants to approach and invite to interview from the identified programmes. Each programme has a programme leader, and some have a mentoring lead, while some programmes have a clinical lead. To ensure consistency, I contacted the programme leaders, explained the remit of the study and invited them to attend an interview. If appropriate, the programme leaders nominated an alternate person in their department to provide me with the information required. One programme leader suggested the mentoring lead for their programme be invited for interview instead of themselves.

All potential participants were invited to attend an interview at a mutually convenient time.

Based on the advice of Fincham (2008), a 60% response rate was aimed for. Five of the potential 14 responded, giving a response rate of 36% – which was lower than anticipated. The relatively small sample size obtained during the exploratory study can affect its

dependability and the transferability of its findings to a wider population, although considering transferability was not a specific aim.

4.4.3 Interview design

The interview questions were developed based on my knowledge of mentoring practices at the time. On reflection this was biased, as it made the assumption that other programmes would have a similar understanding of terminology and mentoring practices. Every effort was therefore made to ensure such bias was later minimised within the pilot and main studies. The questions were developed as a result of differences noted within the literature review regarding terminology, role and requirements and matching students and mentors.

The questions asked to participants were:

1. Are your students allocated a named mentor?
2. Do you differentiate between a mentor and supervisor?
3. How are mentors allocated?
4. Is there a theoretical model of mentorship which you follow?
5. What are the requirements of becoming a mentor/supervisor?
6. What training do mentors/supervisors have?
7. How is the process for the changing of mentor/supervisor managed?
8. Do you give any consideration to gender assignment of mentors?

Question 1 & 2 were asked to set the scene and introduce the subject area and phraseology to be used during the interview. The findings from questions 4, 6 & 8 link with potentially answering research question 1, whereas the findings of questions 3, 5 & 7 link with contributing to answering research question 2.

4.4.4 Interview conduct

The interviews for this stage of the study were conducted during September 2013. Prior to starting each interview, the research was outlined and I confirmed the participant understood the purpose of the interview. This introduction did not follow a complete predetermined script. I realised the importance of having such a script for the pilot and main studies to ensure consistency and ensure inclusion of all points. Verbal consent for audio recording of each interview was gained. Following each interview, the audio files were assigned a code and saved in a secure password-protected folder. The codes had the prefix E to denote part of the

exploratory study. The numbers were allocated to participants chronologically by interview date, from E1 to E5. The demographic data of participants is shown in Table 21

Table 21

Demographic data of exploratory study participants			
Code	Age range	Gender	Role
E1	50+	Male	Programme leader
E2	40-49	Female	Programme leader
E3	40-49	Female	Programme leader
E4	50+	Female	Programme leader
E5	40-49	Female	Mentor lead

4.5 Data analysis and findings

I had originally planned to analyse the data with a thematic approach. By undertaking thematic analyses for this stage of the study, I wanted to learn and subsequently refine skills in this area prior to undertaking the main study. Responses were to be grouped into three or four themes, with suitable comparisons or contrasts drawn. Given the low response rate, there was not enough data to undertake a thematic analysis for this exploratory study. Consequently, given the relatively small sample size, the data analysis process was simple. A descriptive analysis of the results was made, exploring comparisons and contrasts between the responses on a question-by-question basis.

In Chapters 5 & 6 where the pilot and main studies are presented data analysis and findings are presented in accordance with the research questions they relate to. As this study has broader aims the findings of this study will be presented according to the questions asked, to facilitate the subsequent discussion. Where findings relate to one of the research questions, this is highlighted.

4.5.1 Question 1

The first question asked: Are your students allocated a named mentor?

This first question was thought to be straightforward; however, it quickly became apparent that the term *mentor* was not used by all respondents and all professional groups. All respondents indicated that whilst on clinical placement, their students are allocated a specific person responsible for overseeing the student's training. The term *mentor* is familiar and was used by 80% (n=4) of respondents. When explaining the role, it transpired that some use different terms to describe the person who performs the same role. Two respondents indicate that the mentor has a purely pastoral role and in addition to being allocated a mentor, the student is allocated a supervisor. For E1 and E2, someone performing this supervisor role is called a mentor. Practices within the ultrasound programme are different from these findings. Ultrasound students are required to provide details of a specific sonographer who will be their mentor. Their clinical department manager is required to sign a declaration regarding mentoring (including details of the specific mentor) and agreement for departmental support prior to the student being considered for a place on the programme. The responses to this question did not directly contribute to answering the overall research questions, nevertheless the question was valuable for inclusion as it prompted additional thinking about the terminology used as discussed in Section 2.17.

4.5.2 Question 2

The second question asked: Do you differentiate between a mentor and supervisor?

Three of the four respondents whose students have both a mentor and a supervisor clearly differentiate between the roles. Respondent E1 explains how a mentor should not be involved in the assessment of the student, as it could 'ruin the relationship'. In E3's programme there is a clear distinction between a mentor and a supervisor. They have many mentors but a very limited number of supervisors. Supervisors undertaking the assessment are viewed as 'scary' by students. There is less clear differentiation between roles in respondent E2's programme. They explain that the supervisor could also be the mentor. E2 describes the role of the supervisor as 'helping the student to work towards a goal', whereas the mentor is 'responsible for the overall experience'.

Respondent E5 explains that the word mentor is not used within their programme at all. They give a specific name for this person who is involved in the students' summative assessments.

These differences noted with the names of the role prompted the review of literature, as was discussed in Section 2.17. The responses to this question did not directly contribute to answering the overall research questions however they provided information for consideration about the potential impact of a mentor's involvement in the summative clinical assessment, and potential on the pass rates of the student.

4.5.3 Question 3

Thirdly, respondents were asked how mentors are allocated.

All respondents unanimously state that the mentor (or specific person) is allocated to the student by someone from within the clinical department where the student would undertake their placement. None of the lecturing staff on any of the represented programmes at this University have any involvement in the allocation process. All respondents were unaware of how the clinical staff allocate the students to the mentors. Students might know who their potential mentors might be; however, no respondents reported students having any input into selecting who they would like their mentor to be. This allocation of mentors could have an influence upon the mentor and mentee relationship (Research question 2), and as a result questions related to this were included within the pilot and main studies.

4.5.4 Question 4

This question asked if there was a theoretical model of mentorship they followed.

Most of the questions asked during the interview led to discussion and sharing of ideas in an open and relaxed way. This question, however, led to a degree of perceived awkwardness in the participants when they were asked if they had any theoretical underpinning to their mentoring practices.

Two respondents replied 'no' and did not offer any further detail. In retrospect, more prompting would have been helpful here. E2 explained that although no details about specific research could be recalled, they had confidence that 'there is evidence from research'. E4 acknowledged that 'we just do what makes sense' and 'we do what is clearly needed'. E5 initially responded that they were not aware of any theory underpinning their mentoring practices. Nonetheless, they proceeded to cite an article they use within their mentor training by Dweck (2007). *The Perils and Promises of Praise* (Dweck, 2007) has the subheading: "The wrong kind of praise creates self-defeating behaviour. The right kind motivates students to

learn." This article is considered useful and has since been disseminated to ultrasound mentors for reading, as it raises some interesting discussion points, such as providing a balance of positive and constructive feedback, and – more importantly – praising a student for their effort, not their achievements.

The lack of awareness of mentoring literature amongst the respondents in this study links with answering research question 1, in that to guide and support mentors, theoretical mentor information could be provided.

4.5.5 Question 5

Respondents were then asked: What are the requirements or prerequisites for becoming a mentor/supervisor?

All respondents gave a different answer to this question. The responses given were also different from the requirements of the ultrasound programme at this University. Within ultrasound, it is advised that the mentor be qualified for two years before assuming the mentoring role. All ultrasound mentors are invited to training but attendance is not compulsory.

Table 22 shows the different requirements for becoming a mentor.

Table 22

Requirements for becoming a mentor/supervisor	
Programme E1	Should be of an Agenda for Change (AfC) band 6* grade or above
Programme E2	Any qualified member of staff
	Mentor training is provided to final year students in preparation for undertaking the mentor role upon qualification
Programme E3	Qualified for a minimum of 6 months, and has attended mentor training
Programme E4	No specified requirements, as the role is pastoral
Programme E5	No specified requirement to be a mentor

* An AfC band 6 is a specialist role

Table 22 indicates that there is a clear contrast with regards to the prerequisites required to be a mentor, with no overall trends noticed between the programmes. On reflection if was decided that the responses to this question did not directly contribute to answering the overall research questions however they did raise the aspect of quite different attitudes to how mentoring is supported across professional healthcare practice.

4.5.6 Question 6

This question asked about the training provided for mentors/supervisors.

All respondents reported that for those involved in the clinical training and support of students, training is provided by the university. The type, content and frequency of this training differs between programmes.

Mentors on E1's programme were provided with a mentor pack containing information regarding the structure of the course and the corresponding assessments. Detail on how to mentor is also included. E1 personally provides onsite mentor training for those mentors not able to attend the training sessions at this University.

In addition to providing a mentor handbook, mentors associated with E2's programme were invited to attend a mentor training session at the university every two years. This mentor training course is recognised and accredited by the professional regulatory body. No detail about the content of the training was provided.

A two-phased mentor training was offered on E3's programme to staff who are involved with student clinical training. An initial annual training session was run at the university for new mentors and lasted for 3 hours. Follow up mentor training sessions were provided for experienced staff within their workplace, facilitated by university staff, who also arranged for monthly mentor support meetings.

Respondent E4 explained their three-tiered mentor/supervisor training programme. Persons new to the role are invited to a half day introductory session, where significant time spent explaining how to provide suitable feedback to students; student scenarios are discussed to support this. Subsequently, annual support sessions are provided: these involve half days of further scenario-based discussion of student issues and are participant led. The final tier of training is for senior staff with responsibility for student training; again these are offered

annually. The content of the final tier session includes the sharing of issues and support examples. Input into curriculum development is also sought.

The structure of the training provided by respondent E5 was similar to that of E3. Separate training for new and experienced staff is provided. It is offered twice per year, lasting a whole day. The content of the training for new staff has a large focus on the psychological and emotional support for students. The structure of the programme was also explained. Staff are asked about their fears and worries associated with training students – these are then discussed. The training for experienced staff is scenario-based. These staff are also asked about their fears and worries associated with training students. E5 reported that both new and experienced staff report the same fears and worries. In addition to this mentor training, a 'failing student workshop' is also run for those clinical staff who think that they would benefit from it.

Mentors on the ultrasound programme were provided with a handbook and invited to biannual training. This training has evolved over the course of this research and the changes are detailed in Chapter 7 which in turn answers research question 1 regarding the guidelines and support mechanism that may be effective in helping to improve mentoring practices.

4.5.7 Question 7
If a student requests to change their mentor, respondents were asked how this process for the changing of mentor/supervisor is managed.

There was again a consensus that students and mentors who experienced difficulties in their relationship are encouraged to try to resolve these differences rather than change mentors. The rationale for this is to instil team working and conflict resolution skills in the student. E1 explained that 'most frictions are minor and resolve with time'. The reason for frictions, according to E1, is that anecdotally they tended to stem from past relationship history rather than the current mentoring issues.

The concerns encountered between mentors and students, according to E2, are mainly attributed to misunderstandings. With support from the university, these can then be resolved without the need to change mentors. Respondent E3 did not have a process for managing requests to change mentors.

Due to the structure of the clinical practice, students on E4's programme did not have the facility to change mentors. Occasionally another person in the team could become the mentor; however, this is a rare occurrence.

Respondent E5 reported a similar mechanism to E4 for managing change, in that if the relationship failed, the placement could be terminated. Depending on the evidence for this, the resit placement might be a deferral or a referral. At the end of every placement on E5's programme, students provided feedback on their mentor/supervisor. These feedback forms are monitored to identify recurring issues.

The lack of formal process for changing mentors detailed by respondents is comparable to the ultrasound programme. It is often noted that a student will develop coping strategies rather than request a change of mentor. However, this only became apparent in the interviews for the main study. Findings here regarding potentially changing mentors can influence the relationship between the mentor and the student, thus these responses directly contribute to answering research question 2, discussed in Chapter 7.

4.5.8 Question 8
It was asked if any consideration was given to the gender assignment of mentors.

Unanimously, and as within the ultrasound programme, all respondents replied no to this question and the issue was not considered further. This question could contribute to research question 2 in that gender is not an influencing factor on the mentor / mentee relationship.

4.5.9 Final comments
Prior to ending the interview, respondents were asked if they had anything else they wanted to add regarding mentoring.

Three respondents replied.

Respondent E2 explained that the university has limited involvement in the student mentoring and articulated: 'It's best not to know too much as we cannot control it.' E2 went on to describe ideal mentoring practices: they wished 'all students had their own mentor and do not have to share' and that 'they worked with their mentors more'.

Along a similar vein, E3 used the opportunity to explain the changes they proposed making to their mentoring programme. A more detailed guide to mentoring would be developed where skills and competencies are monitored. The mentor would have 'more directed activities'. These developments had the aim of moving the role of the mentor away from being purely pastoral and into a more supervisory capacity. This response could contribute to answer research question 1, as a means of guidance and support available.

Respondent E4 clarified the needs they have identified regarding mentoring. They would like the mentors to give better feedback to students. They would like greater consideration to be given to the learning environment. However, the main changes they highlighted required staff to understand the differences between their programme and other comparable programmes at other HEIs.

4.6 Discussion

This discussion will identify some of the relevant areas that arose as a result of this exploratory study, points regarding the findings are made and related to the research questions as suitable. Further discussion focusses on the reflections and learning from this study and how it facilitated the development of the pilot and main studies.

4.6.1 Does 'mentor' mean the same to all?

This stage of the data collection highlighted disparity in the use of the term *mentor*, as previously defined in Chapter 1. The definitions of mentoring presented in Chapter 1 did not all include or acknowledge mention of any teaching or supervision. The definition does not give consideration to working with the student on a daily or regular basis. Two respondents used the title of mentor in relation to pastoral support, two in relation to supervision and one made no use of the term at all. What was evident was that all students are allocated a specific person to oversee and support their training. This led me to consider that the term *mentor* was not perhaps appropriately used within the questions, given my previous understanding of the role from an ultrasound perspective. I decided that the literature review needed to be expanded to include additional areas, such as student supervision, training and clinical support – Section 2.17 includes discussion of these additional areas. During the initial literature review,

the use and meaning of the term *mentor* appeared to be used consistently; however, this exploratory study highlighted that this might not be the case. A positive aspect that can be taken from this is that regardless of the name, students from all the programmes represented in this study have a specific person that they can turn to for support whilst they are away from the university on clinical placement.

Where the traditional mentor role encompassed supervision, training and teaching, respondents were allocated profession-specific mentors, whereas when the mentor role was purely pastoral, allocation was more varied, with respondent E4 saying that the administration and support staff liked to get involved in mentoring. Other respondents indicated that the mentor could also be involved in summative assessment. This practice is comparable to that of the ultrasound programme, where ultrasound mentors are involved in the formative and summative assessments of students. Kay and Hinds (2005) state that the mentor should be seen as independent of assessment, whereas Kilgallon and Thompson (2012) present a different viewpoint. They claim that mentors can make an objective decision about a student performance in a summative assessment in their role as healthcare professionals. This gave a further area that was explored with the pilot and main studies. Opinions were sought from students and mentors regarding the mentor role in summative assessment and contributed to the discussion about formative support mechanism discussed within Chapter 7.

The original question "Are your students allocated a named mentor?" was flawed, as it made the assumption that other professions used mentor in a similar way to my own programme. Methodologically, the benefit of undertaking an interview in comparison with a questionnaire was demonstrated through this question. Through dialogue with the respondent, I was able to gain expanded answers and ascertain that each programme has someone undertaking the role, but with different titles. The need for thorough piloting of questions prior to the main study was seen to alleviate potential flaws.

4.6.2 Matching of student and mentor

The matching of the students and mentor may influence their relationship, thus this discussion directly relates to the answering of the second research question. The reported lack of any university involvement within the matching process was consistent between programmes, and is comparable to the practices on my own programme. As the literature review noted, Nick et al. (2012) and Straus et al. (2009) state that the matching of student and mentor is crucial for a successful mentoring relationship. It was thought prudent to investigate this area

further within the main study. Questions were included to explore the selection of students and allocation of mentors. Mentors were asked about their feelings regarding their role in the selection and allocation of mentors.

As an aside: at the mentor training that took place immediately after the exploratory study, I asked mentors if they would consider including some student input in choosing their mentor. No mentors thought that this would be possible, although they gave no reasons for this. Therefore, if this matching process is considered so crucial, a change in mind-set is needed to ensure willingness regarding this suggestion.

4.6.3 Theoretical underpinning

In my opinion, as an academic at this University, one's ultrasound teaching should be evidence-based, as this is also encouraged by the students. Whilst there might not be literature available specific to each respondent's discipline, theories regarding mentoring can be applicable across disciplines. The respondents appeared to have limited or no knowledge regarding the mentoring literature. In my opinion, it seems to be a case of 'do as I say, not as I do' as participants appeared to behave differently when the questions regarding awareness of mentoring literature were asked. This emphasises a weakness with audio recording as opposed to video recording the interviews. Had a video of the interviews been available, analysis of body language and facial expressions could have been made to help support or contest my perceptions regarding this. A personal benefit to undertaking this study was also an increase in my own awareness of mentoring. Providing mentors with a theoretical background, either during mentor training or within supporting documentation was one means of answering research question 1, in that information may be effective in supporting mentors.

4.6.4 Training of mentors

The training of mentors is a support mechanism, thus directly contributing to answering research question 1. An aspect of the mentoring training detailed by respondents which I found interesting was the opportunity to undertake training specific to previous training or past experiences. Respondents were all willing to provide details regarding the content of their training sessions. This practice could be considered for adoption on the ultrasound programme. Details about changes made to the ultrasound mentor training are discussed in Chapter 7.

Respondent E5 suggested the potential for joint mentor training between programmes. If the theory of mentoring is the same regardless of the profession, it would be more staff-efficient to deliver joint training. However, the opposing viewpoint is that the specific requirements of mentors might differ between programmes and generic training might not include all relevant areas. One possibility would be to run two sessions, firstly generic training for all mentors, followed by profession-specific sessions.

4.6.5 Additional comments

The three respondents who chose to make additional comments all responded on the topic of changes they would like to make to their mentoring. This encouraged me that they had obviously given thought to mentoring and identified improvements which can be utilised in updating ultrasound mentor training, and answering research question 1.

4.7 Reflection on the semi-structured interview process

Reflecting on the exploratory study was necessary in order to both capitalize on the strengths of the study, and to refine and develop any other areas. This subsequently informed the development of the pilot and main studies. To facilitate reflection on this section I used the Driscoll (2007) model of reflection as a basis. Driscoll advocates reflecting in three stages: What? So what? Now what?

4.7.1 Question order

What? As the analysis commenced, it became evident that the questions were asked in a muddled order, lacking in flow and continuity.

So what? It could be argued that the order is not as important as the content, so this might not have affected the data gathered.

Now what? By planning the data analysis concurrently with planning the data collection, this could be avoided. It was useful to learn from this at this stage of the overall study in order to allow time to make changes and improve my practices. For the pilot and main studies consideration was given to the method of analysis to be used during the development of the data collection.

4.7.2 Interview technique

What? The first interview undertaken lasted approximately five minutes duration; the fifth interview lasted 45 minutes.

So what? Part of the justification for using interviews as a data collection method was the ability to prompt, refine and reword the questions if I was not getting the information in enough detail or as I needed.

Now what? Although the same questions were asked for all interviews, my confidence in enquiring for more detailed answers developed, thus the time lengthened and a greater depth of discussion emerged. I also learnt to give the respondent time to think and respond, rather than rushing them on to the next question. Over the course of the five interviews, I refined and improved my interview technique, gaining more confidence in prompting and asking for expansion on responses. These improved interviewing skills were transferred to the pilot and main interviews, as I gained confidence in my abilities as an interviewer.

4.7.3 Note taking

What? During these exploratory interviews, in addition to audio recording, notes were taken.

So what? This approach may have led to challenges in the qualitative data analysis. Blaxter et al. (2006) advise not taking notes in front of the interviewee during interviews, as it can be distracting and they can read into it if you do, or do not, make note of responses. This might have led to them expanding on answers or honing their subsequent responses based on the reaction they received.

Now what? For the pilot and main studies, no notes were taken during the interviews. In relation to my interviewing technique, I improved my ability to remain neutral and to present an impartial viewpoint. As the interviews were undertaken with colleagues, I was able to gain feedback on my interview technique. One respondent commented that they had never seen me as enthusiastic and passionate about something – they said as a result they might consider a Doctoral study themselves, as it was pleasing to see someone enjoying the process.

4.7.4 Mentoring awareness

What? Throughout the exploratory study, it was evident that some participants lacked awareness of the mentoring processes within their own programmes.

So what? Those that did show awareness had limited knowledge of relevant theoretical underpinnings to support their practice.

Now what? During the data analysis, I was prompted to consider the consequence of respondents not being aware of mentoring literature or current practices within their

programmes. The implications of not being up-to-date in awareness could affect the student experience of mentoring. However, taking part in this study might have prompted respondents to increase their knowledge of mentoring. This possible lack of awareness regarding mentoring may also arise during the pilot and main studies. It is anticipated that in the pilot and main studies, by taking part in interviews or completing questionnaires might prompt thoughts on mentoring practices which may in turn lead to changes in practices.

4.7.5 Interview location

What? Prior to commencing the interviews, I had not appreciated the importance of giving consideration to the location in which they would take place.

So what? Numerous interruptions occurred during the interviews, which distracted both me and the interviewee, and affected our concentration.

Now what? Oppenheim (1992, p. 69) recommends that they are conducted "somewhere private, comfortable, not intimidating". The interviews for this part of the study took place in a variety of locations. Due to interruptions during some of the interviews, I reflected that in future the location should be given greater consideration. A location that was neutral to both the participant and the interviewer should be selected. Davies and Hughes (2014) advocate having a headquarters for interviews and that that place should be "comfortable and familiar, confidential where you are not overheard" (Davies & Hughes, 2014, p. 182). Consequently, a suitable room was chosen as the headquarters for the interviews conducted during the pilot and main studies.

4.8 Summary

The three aims of the exploratory study were successfully achieved which in turn facilitated contributing to the answers for research questions 1 & 2. There were limited elements to the data in this study which provided information regarding the potential impact on pass rates that mentoring might have. As intended, I gained greater understanding of the mentoring and supervision practices of other health programmes within the School of Health and Social Work at this University. I was able to compare and contrast these findings with the practices on the ultrasound programme. Finally, this exploratory study gave me the opportunity to develop my skills in data collection design, interviewing skills and data analysis. The developed skills gave me reassurance to design and undertake robust data collection tools for the pilot and main studies.

This exploratory study provided the opportunity to share good practice ideas about mentoring between programmes. I was able to identify areas of good practice that I might integrate into the ultrasound programme, such as the staged mentor training. Two participants asked for details of the mentoring training on the ultrasound programme so they could identify some areas of good practice that they could consider implementing in their own programmes.

The exploratory study highlighted the fact that the term *mentor* means different things to different professional groups and different people. The results of the exploratory study demonstrated that the mentoring within the ultrasound programme did not match with the mentoring practices within other programmes within the School of Health and Social Work; however, this is not necessarily a negative point as all programmes' practices were different. Further work was needed to develop an understanding of the role of the mentor.

As well as designing a robust data collection tool for the pilot and main studies, equal consideration needed to be given regarding how the data would be analysed. I recognised this was an area of weakness in the exploratory study.

This study reaffirmed that interviews are appropriate as a data collection technique, that I had the skills to undertake them appropriately and that they can result in useful findings. It was decided that interviews would be used within the pilot and main studies to collect data from the students. Logistical limitations prevented interviews being undertaken with mentors, so questionnaires were employed to collect data from them.

In the next chapter, the methods of the pilot study are described. This will be followed by presentation and discussion of the results. An important element of the pilot study is the reflections from it in informing the main study.

Chapter 5. The Pilot study

5.1 Introduction

The previous chapter presented the findings and learning resulting from undertaking the exploratory study. This chapter will now provide detail regarding the pilot study. The aims of this study will be presented. The methodology was explored within Chapter 3, so this chapter will present the specific methods undertaken. The findings of the study will be conveyed and then discussed. Throughout the discussion, reflection on the specific questions will be included where significant learning occurred. This chapter will conclude with reflections on the pilot study and how it subsequently informed development of the main study.

5.2 Aims of the pilot study

The aims of the pilot study were twofold. The foremost aim of a pilot study is to test the procedures and data collection tools prior to the main study. It is necessary to ascertain if the data collected is suitable and would provide results that would facilitate answering the overall research question. There were two secondary aims of the pilot study: firstly, to investigate the features that might affect mentoring from both the students' and the mentors' perspectives. Secondly, the aim was to identify how the matching of mentors and students took place and the understanding of both parties towards the matching process. These aims were developed to allow the research questions (duplicated below) to be answered

1. What guidelines and support mechanisms may be shown to be effective in helping colleagues and students in mentoring practice?
2. What factors may influence the relationship between the mentors and mentees?

This was achieved through interviewing students about their experiences of mentoring. Alongside interviewing, questionnaires were sent to their mentors asking about mentoring relationships, the strengths and limitations along with any constraints they faced when mentoring. Feedback on practices at this University were asked for in relation to the mentoring handbook, mentor training and comparability with other universities, with the view to inform further changes and development of ultrasound mentoring training at this University.

5.3 Background

The exploratory study highlighted some potential areas that could be explored further through the pilot study. Much of the literature reviewed discussed mentoring from either the mentors' or the students' points of view; however, I felt it important to ascertain the thoughts, feelings and opinions of both groups, and then compare and contrast their answers. Nick et al. (2012) and Straus et al. (2009) state that the matching of student and mentor is crucial for a successful mentoring relationship: it therefore seemed obvious that both should be included within this study.

5.4 Methods of the pilot study

The advantages and disadvantages of collecting data through semi-structured interviews and questionnaires has been presented in Chapter 3 and are not replicated here. This section will describe in detail the methods used for the two stages of data collection for the pilot study.

5.4.1 Sample population

The sampling strategy employed within research is often designed to fit within certain constraints (Bell, 2010). It was necessary, therefore, to consider the constraints or limits to a sampling method in order to allow achievability.

The potential population could be defined as any student who has studied a clinically based module on the diagnostic ultrasound course at this University since its commencement in 1991, along with their mentor. It was not realistic to approach all the students and mentors since 1991. The main reason here was that the requirement for mentoring at the time was not known, thus findings would not be comparable to current practices. Secondly, contact details were not available for them and it is unlikely that a student who qualified a number of years ago would have clear memories of the mentoring they received during the ultrasound course. Mentors who oversee one or two students a year might struggle to remember the specific nuances of certain students in the past. They might only remember the really good or really bad elements of the mentoring experience; in particular, negative events may be embellished and exaggerated.

In order to gain the most accurate information, it was thought prudent therefore to contact students from the 2013 cohort (intake n=18). A purposeful sampling technique was employed from this potential population. Students and mentors were included based on those with known experiences of mentoring which stood out as particularly positive or negative. This

purposeful sampling method was to ensure a representative range of student experiences. The final inclusion criteria for students and mentors to be included in the pilot study are shown in Table 23.

Table 23

Inclusion criteria for the pilot study

Student inclusion criteria:

- Commenced studying the HHMIRSDU one year PGCert or two year PGDip ultrasound programme in Semester A 2013

- Commenced studying the HHMIRSDU two year ultrasound programme in Semester A 2012

- Reported particularly positive or negative mentor experiences during the course

- Mentors had reported particularly positive or negative mentor experiences during the course

Mentor inclusion criteria:

- Being the mentor for a student who commenced studying the HHMIRSDU one year PGCert or two year PGDip ultrasound programme in Semester A 2013

- Being the mentor for a student who commenced studying the HHMIRSDU two year ultrasound programme in Semester A 2012

- Being a mentor who had reported particularly positive or negative mentor experiences

- Having had students who reported particularly positive or negative mentor experiences

5.4.2 Selection and recruitment of participants

Purposeful sampling included students and mentors from six specific clinical departments that were known to have had either very positive or very negative experiences from either the student's or mentor's perspective. For ethical reasons these clinical departments were not directly named. They were referred to by numbers and prefixes: S for student, M for mentor and P to indicate part of the pilot study.

Students and mentors were invited to take part via personal email invitation.

All who responded were included in the study, regardless of whether a response was received from their corresponding student/mentor.

5.4.3 Interview design

The purpose of the interviews was to explore the mentor experiences of the students. Following on from reflections and the outcomes and experiences of the exploratory study, there were six questions asked. For each one a list of prompts was provided in order to ensure all possible areas for discussion were drawn out.

Bearing in mind the pilot nature of the study, students were also asked for feedback on the content and nature of the questions. Did they understand what was asked and what was expected from them? No areas of concern were subsequently highlighted regarding the question format.

Table 24 contains the questions and links to corresponding research questions. Details of prompts used can be found in Appendix B.

Table 24

Interview questions for students – pilot study	
Question:	Link to research question(s)
1. Please can you tell me about your experiences of the mentoring you received during your ultrasound training?	Both - depending on responses.
2. Please can you describe your relationship with your mentor?	2
3. The university provides a mentor handbook and mentor training for all mentors. What do you think should be included in the handbook and training sessions?	1
4. If you were asked to be a mentor in the future, what would you make as your priorities in this role?	2
5. Did you pass your clinical assessment first time? *OR* Do you think the mentoring you are receiving will affect your ability to pass the clinical assessment?	Additional consideration
6. Is there anything else you would like to tell me about mentoring of ultrasound students?	Both - depending on responses.

When the interviews began, I formally introduced myself and outlined the aims of the research. I checked that the participant information sheet had been read and understood and collected the signed consent form. I explained that the interview should take no more than 30 minutes. Confirmation of audio recording was made. No notes were taken during the interviews, as previously explained in Chapter 3.

5.4.3.1 Interview Location

Bell (2010) describes that wherever possible, interviews should take place somewhere private and free from disturbances. Learning from the exploratory study, a quiet, neutral place was chosen for the interviews. The interviews therefore took place in the ultrasound practical laboratory one of the campuses at this University. This room met all the criteria previously mentioned in Chapter 3, namely being known to the students, private, quiet and comfortable.

It was also a more neutral location than my office. Further benefits of this room were no telephone and an entrance limited and controlled by electronic swipe system, thus further limiting opportunity of interruptions.

As the students were recruited from a wide geographical area, potential participants were offered the choice of a face-to-face, telephone or Skype format for convenience. Whichever format was chosen, the same structure and format of the actual interview remained constant and comparable. However, in this pilot study, all students who responded opted for face-to-face interviews.

5.4.4 Questionnaire design - For Mentors

Questionnaires which are sent from a university are often completed more readily than those sent from people with a commercial interest, according to Edwards et al. (2002). As this questionnaire was sent as part of a university course, it was anticipated it would gain a suitable response return rate.

The questions asked can be seen in Table 25, with the link to the specific research questions. The questionnaire was designed utilising a mixture of open and closed questions. The questions were formulated as a result of the literature review and reflection arising from the exploratory study. A copy of the questionnaire can be found in Appendix C.

As this was a pilot study, respondents were also asked for feedback on the contents and nature of the questions, whether they understood what was asked and what was expected from them. No responses regarding this were received.

A total of 10 questionnaires were distributed and six responses were returned, giving a response rate of 60%, which was deemed an acceptable response rate.

Table 25

Questions asked of mentors – pilot study		
Question	Response options	Link to research question(s)

1. How were you selected to be a mentor?	Range of options provided	1
2. Did you have any involvement in selection of the student for training?	Range of options provided	1
3. Please can you give some examples of the good practices you think you demonstrate in your mentoring?	Box for free text responses	2
4. Please can you give some examples of the things you would like to do differently in relation to your mentoring if there were no constraints?	Box for free text responses	2
5. What, if any, constraint do you encounter in your mentoring?	Range of options provided	2
6. Please can you describe what you consider to be the ideal relationships between mentor and student and if this changes over time?	Box for free text responses	2
7. To what extent did you use the mentor handbook provided by this University?	Range of options provided	1
8. Please think about the two mentoring training days offered by this University.	Range of options provided	1
9. Please give details of any improvements in training or support you would like the university to provide to help you in your mentoring role.	Box for free text responses	1
10. Have you had experience training ultrasound students from other universities in the UK?	Range of options provided	1
11. Please use this space to add any further comments you have about the mentoring of ultrasound students in clinical practice.	Box for free text responses	Both - depending on responses.

5.4.5 Data analysis

As the questionnaire contained a mixed style of questions, it facilitated analysis by both descriptive statistics and narrative overview.

The data from within the questionnaire contained five questions which were open and therefore qualitative in nature.

The first stage of preliminary data analysis from the free text responses to the open questions was performed by developing a word cloud generated by the Wordle™ software programme. Wordle™ (Feinberg, 2008) takes a piece of text, in this case all of the responses to the open ended questions and converts them into a word cloud via the online programme Wordle™. The word cloud generates an image where greater prominence is given to words that appear most frequently within the inputted text. The use of word clouds was seen as an additional experimental approach to data analysis as it is not yet a widely trusted approach to data analysis Whereas consideration is given to different learning styles i.e visual, aural, kinaesthetic within mentoring (See Section 2.15 and Chapter 7) then in a similar way, people with different learning styles can find different methods of data analysis beneficial. I am fully aware that learning styles research now indicates the benefit of adopting a wide variety of approaches instead of a single style of learning hence the Wordle™ is included as an additional preliminary approach to data analysis.

It was used as a starting point for the thematic analysis, since a visual representation of the text allowed me to clearly see frequently occurring words. The visual approach identified words, but could not consider their relevance or context. The second stage of the analysis was took a more traditional thematic analysis approach with different text highlighted in a range of colours. The highlighted questionnaires were then searched for these frequently occurring words according to the Wordle™ in order to identify themes and to ensure they were used in a similar context. The range of Wordle™ produced images can be found throughout the findings within Section 5.5.

The remaining questions, which were closed, asked respondents to select from a predefined range of answers. Quantitative responses were then recorded from these responses. These were entered into Microsoft Excel®. From this, a graphical representation of the data was produced. Formal statistical analysis was not performed, due to the small sample size.

The student interviews were analysed with a type of thematic analysis. Again Wordle™ was used initially and later compared with the Wordle™ from the mentor responses. The themes identified within the questionnaire analysis were searched for in the interview transcripts and coded accordingly. The remaining parts of the interviews that did not correspond with the mentor thematic analysis were analysed for their own themes.

5.5 Findings and discussion

The demographic details of the student interview and mentor questionnaire responses are presented first. This is followed by presentation of the findings of the student interviews and mentor questionnaires, which are linked to the two research questions. Discussion of both questionnaires and then interviews follows according to the linkage to the research questions. Later discussion will focus on reflection of the outcomes and what was learnt from this study, and how it then facilitated the development of the main study. The discussion will compare and contrast the response between the two groups. There was only one training situation where both the mentor and student took part, therefore direct correlation between matched students and mentors was not possible.

5.5.1 Student Interview demographics

The demographic data of the students who took part in the interviews is shown in Table 26.

Table 26

Demographic details of students – pilot study						
Code	Gender of student	Gender of mentor	Age bracket	Background	Reported mentor experience	Response received from mentor
SP1	Female	Female	Under 30	Radiography	Positive	No
SP2	Female	Female	Under 30	Radiography	Positive	No
SP3	Female	Female	40-49	Radiography	Negative	Yes

MP1 corresponded to student SP3. For the main study the codes will align more closely for ease of understanding; however, it was less relevant here as only one matched pair responded.

The interviews were transcribed verbatim by a third party. Both the audio recording and transcriptions were used for the analysis. The responses were analysed on a question-by-question basis, drawing comparisons between the three respondents where appropriate. Rather than considering only key words, responses were considered in context whilst identifying themes. Where the responses included very technical detail regarding ultrasound procedures or protocols, these were excluded from the analysis. As the aims of the study were not to investigate specific ultrasound techniques or departmental protocols, the information regarding this was not deemed necessary for inclusion, unless it also directly related to mentoring.

5.5.2 Mentor questionnaire demographics

Table 27 shows the demographic data of questionnaire respondents. The demographic data was compiled based upon prior knowledge of the respondents.

Table 27

Demographic details of mentors – pilot study						
Code	Gender of mentor	Age bracket	Years qualified	Background	Reported mentor experience*	Response received from student
MP1	Female	Under 30	5-10	Radiography	Negative	Yes
MP2	Female	40-49	>15	Radiography	Negative	No
MP3	Female	Under 30	<5	Radiography	Negative	No
MP4	Female	50-59	>15	Nursing	Positive	No
MP5	Female	40-49	>15	Radiography	Positive	No
MP6	Female	50-59	10-15	Radiography	Positive	No

*Experiences of being a mentor

The use of colour within the figures does not have significance. A pastel colour palette with similar tones was selected, so as not to inadvertently highlight any element.

5.5.3 Research Question 1

This research question asked: What guidelines and support mechanisms may be shown to be effective in helping colleagues and students in mentoring practice? As shown in Table 24 the

corresponding interview questions are presented, followed by the corresponding relevant questionnaire responses as detailed in Table 25.

5.5.3.1 Questionnaire findings and discussion

The first question in the questionnaire to mentors asked about the selection process for being a mentor. Figure 5.1 shows the responses selected from the predetermined options. The following options received no response: 'randomly selected', 'I was given no choice and did not want to be a mentor', 'rather not say' and 'other, please give details'. These are not represented in Figure 5.1.

Figure 5.1 - Response to question: How were you selected to be a mentor?
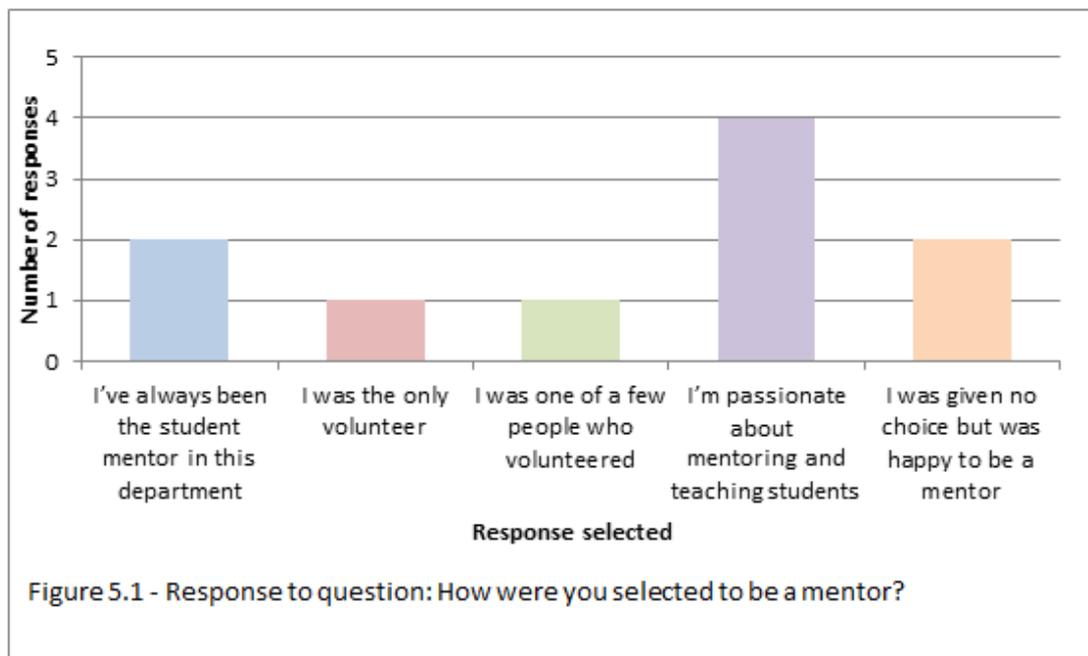
Questionnaire mentor respondents were then asked about their involvement, if any, in the selection of the students who they would be mentoring. Figure 5.2 displays these responses. The options 'was asked to be involved but declined' and 'other, please give details' received no response so were not included within Figure 5.2.

Figure 5.2 – Mentors' involvement in student selection
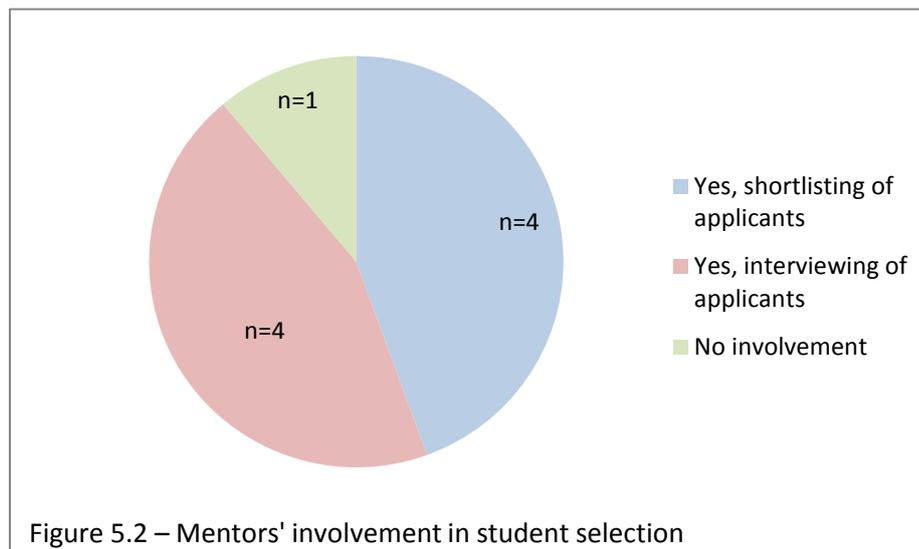
As respondents were able to select more than one response, the total number of responses (n=9) was more than the sample size (n=6). Involvement in both the shortlisting and interviewing was undertaken by 50% of respondents (MP1, MP4 and MP6). Overall, five of the six respondents had an input into the selection of their students, with only MP3 having no involvement at all. MP3 was also one of the respondents who indicated no passion for mentoring and teaching in the previous question – but the relative importance of this has not been determined, due to the small sample size.

In answering the research question, it would appear that a suitable guideline would be that the potential mentor should have some involvement in the interview or selection process for the new student.

The first two questions which asked about selection of the mentor. Respondents MP2 and MP3 identified that they volunteered for the task of being a mentor. Parise and Forret (2008) stress how people who volunteer to be mentors are more likely to have a positive relationship and be better mentors than those who are forced into the mentoring role. Both MP2 and MP3 were selected for inclusion in this study based on a reported negative mentoring experience by their respective students. Both MP1 and MP6 selected the response of 'I was given no choice but was happy to be a mentor'. As the response includes the word 'happy', they cannot be said to have been forced into the role and thus do not meet the remit stated by Parise and Forret (2008) as being likely to fail in the role. The responses to this question do not appear to correspond with the findings of Parise and Forret (2008). On the other hand, the sample size

of Parise and Forret (2008) at 97 was considerably larger than this study, which may explain apparent differences in findings.

Of the responses received, MP2, MP3, MP4 and MP5 identified that they were passionate about mentoring and teaching. This may have led to potential bias in this study, as those who are passionate about mentoring may have been more inclined to take part in this study compared with those who are not, or who have little interest in mentoring. Interestingly, MP1 and MP6, who did not claim passion for mentoring, were identifying above as having not volunteered for the role. Respondents were asked to select all responses that applied to them: all four respondents who selected 'passionate about mentoring' as an option also gave an additional response about their selection for the role. Those who selected 'I was given no choice' gave no other responses. Just because someone volunteers for something does not mean they will be the right or best person for the role, and just because someone is passionate about something also does not necessarily mean they will be good at it. Those who were given no choice and do not claim to be passionate about mentoring might actually be the best person for the role in their department. Although unfeasible, it would be interesting to question other sonographers within MP1's and MP6's departments, to explore if any of them have a passion for mentoring and teaching.

Kay and Hinds (2005), Straus et al. (2009), Eby et al. (2010) and Nick et al. (2012) all discuss the importance of carefully and correctly matching the mentor and the student. The majority of mentors reported in question 2 had some involvement within the student selection process; this aligns with the previous findings in the literature and can therefore support the proposals made by the authors. On the other hand, Clutterbuck (2011, p. 5) offers the opinion that "selection by mentors has a dismal record and is best avoided". MP3 aligns with Clutterbuck's findings. Clutterbuck does propose that good practice is to allow the student to choose from a few potential mentors, although this was not directly asked of respondents. According to Poteat et al. (2009), unless the mentor and student are equally committed to the relationship, problems can occur between them and changing mentors may avoid these problems. Eby et al. (2010) explain that there should be the option for the student to request a new mentor without any negative repercussions if a breakdown of relationship occurs after matching.

In answering research question 2, the data obtained here supports the work of Kay and Hinds (2005), Straus et al. (2009), Eby et al. (2010) and Nick et al. (2012) in that the matching of the mentor and student is an important aspect in influencing the relationship.

On reflection, questions 7-10 of the mentor questionnaire were not deemed directly relevant to answering the aims of the pilot study; however, they are included below as they inform answering research question 1, related to a possible support or guidance mechanism for mentor.

Question 7 asked: To what extent did you use the mentor handbook provided by this University?

All mentors are provided with a mentor handbook to support them in their role as mentors; they are also invited to attend two mentor training days each year. Figure 5.3 shows the responses when asked about the use of the mentor handbook.

Figure 5.3– The use of the mentor handbook
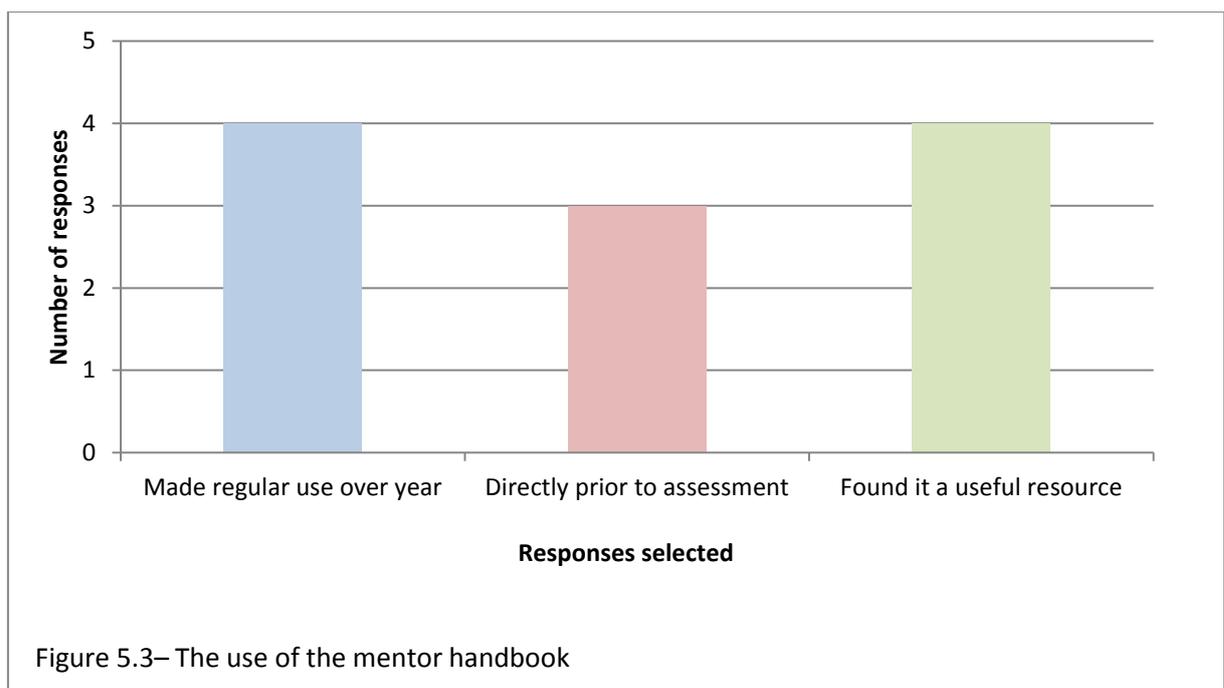
Whilst there is no specific literature to draw a parallel regarding the use of handbooks, this was a useful question to ask, as the current mentor handbook was being updated to ensure it continued to be fit for purpose. This question was helpful in determining a number of components. Firstly, no one selected the option 'didn't have a handbook': this showed that the methods of distributing the handbook were successful. Other options not selected included: 'read it at the start then not again', 'had a copy but did not read', 'found it an unhelpful resource' and 'other'. The non-selection of these indicates that the handbook does

seem to be meeting its purpose, although the extent of this was not determined. Also on reflection, the phrasing of the predetermined options could be improved.

Question 8 of the questionnaire asked: Please think about the two mentoring training days offered by this University.

Figure 5.4 shows the responses to question 8.

Figure 5.4 – Mentor training days
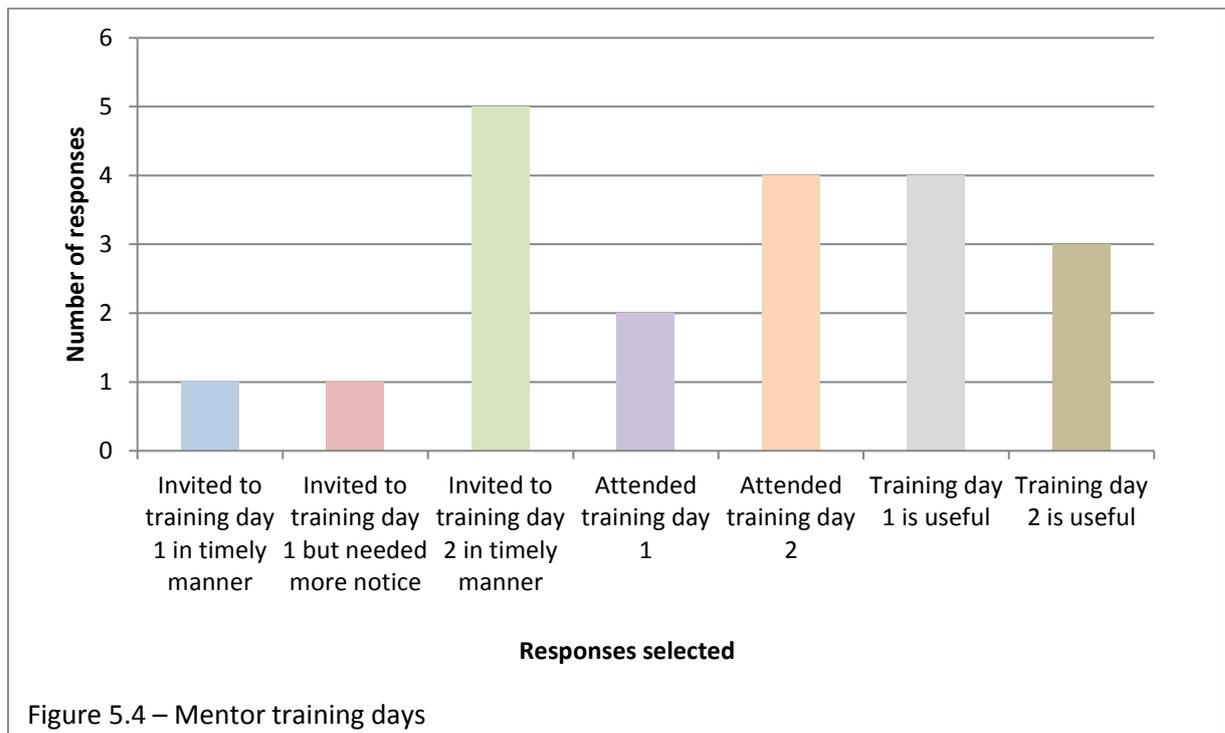
As with question 7, there is no literature with which to link these findings; however, the responses supported the planning and delivery of subsequent training days. Within Figure 5.4 there was some mismatch between the answers given. Four respondents reported finding the first training day useful, yet only two said they attended. This mismatch leads to questioning of the wording and clarity of the questions asked, or the understanding of the respondents. The question also had some bias in that there were no options to respond that the mentor training days were not found to be useful. Other options which received no response were: 'invited to training day 2 but needed more notice', 'my department could not support me to attend', 'attended in the past and did not want to attend' and 'not interested in attending'.

As a result of this initial review, alterations were made to the timing of dissemination of invitations to the mentor training days. Mentors had never been asked for feedback about mentor training in the past; however, in future it will be useful to re-evaluate this every few years and monitor responses.

In question 9, mentors were asked: Please give details of any improvements in training or support you would like the university to provide to help you in your mentoring role.

Of the respondents, 50% indicated there was nothing different they would like with regards to training and support. This was pleasing to note and will be considered in the development of the new handbook and future training. Of those who highlighted areas of change, increased feedback mechanisms were requested. It was anticipated that the newly implemented portfolio in 2015 would go some way to help this feedback mechanism. MP1 said they would like: 'Information on teaching styles, setting goals, managing difficult situations etc.' This is covered in the first training day, which this particular mentor had not attended. Emphasising the importance of attending training days, along with their content, has subsequently been increased.

Question 10 of the mentor questionnaire asked: Have you had experience training ultrasound students from other universities in the UK?

The responses to this question are shown in Figure 5.5. No respondent selected the response that indicated that the experiences of the mentoring training and support is better than that provided by this University.

Figure 5.5 – Experiences from other universities
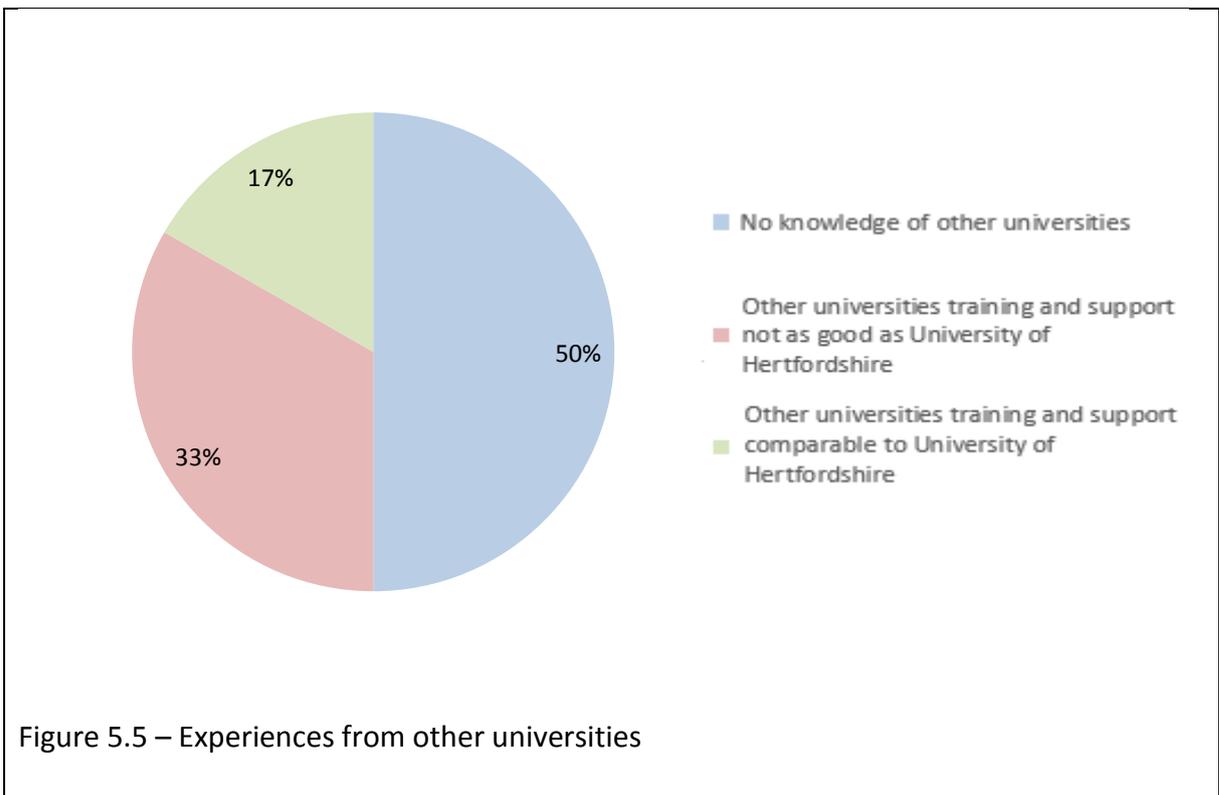
At the time of the pilot study, consideration was given to collecting data about the mentor training provided to those attending other ultrasound courses in the UK. It was later decided that this element of data collection would not be undertaken. Other universities are both competitors and colleagues, so it was considered inappropriate to question their mentor training. Also, as the structure of the external ultrasound courses differ, the mentor requirements may also be different and thus meaningful comparison would not be possible anyway.

The final question asked of mentors in the questionnaire gave the opportunity to add any further comments that mentors might have about the mentoring of ultrasound students in clinical practice. The comments made are shown in Table 28 and are presented here as the majority link with research question 1 with regards to support mechanisms. Within the free text responses to question 11, it was professionally pleasing to note that two of the mentors commented positively on the support they receive from ultrasound staff at this University. It is envisaged that this support continues and improves and contributes information to answer research question 1. The comment regarding allowing students to change their mentor agrees with the findings of Eby et al. (2010) previously mentioned, and was again something that needed to be considered at mentor training and student induction.

Table 28

Further comments about mentoring students in clinical practice – pilot study (Free text responses – presented verbatim)	
Code	Comments
MP1	It is really useful and helpful knowing that I have the full support from the University lecturers.
	Knowing that there is open communication is hugely reassuring and in order to ask advice and raise concerns where necessary.
	Advice given has always been useful and I have tried to implement as best as I can.
MP2	I think this is a crucial role which helps produce a good sonographer.
	I often hear of poor mentors who are not encouraging and who appear to 'teach' by criticism creating an environment of fear and resentment hopefully there are good role models in the department otherwise theses poorly trained sonographers may go on to be poor mentors themselves.
	Students should be given the opportunity to change their mentor if they have good reason.
MP3	I have mentored students from 4 different universities and I feel that the standard at the other universities is poor except for …University *[name removed]*. This University's students are recognised as well trained and supported when compared to other universities.
	I like the assessments that involve both the hospital and university.
	Keep up the good work and thank you for all your support.

5.5.3.2 Discussion of Interview findings from the student perspective

The findings from question three of the interviews which asked about the mentor handbook and mentor training are presented in Table 29 as they support the answering of research question 1.

Table 29

Question 3: What should be included within the mentor handbook and mentor training sessions from the student point of view	
Respondent	Key points from response
SP1	There should be details about assessment and contact details
	I've never seen them (my mentor) refer to it
	I'm not sure if they (my mentor) attended the training
	It's difficult to tell when they're mentoring and teaching
	I'm confident in their ability to mentor though
SP2	It should outline expectations
	Tell how to link theory to practice
	Never refer to it
	I know they attended training
	I'm confident in them as a mentor
SP3	I never seen a handbook
	It should tell about body language and empathy – she oozes confidence
	I think they (my mentor) attended training

All three respondents declared that they had confidence in their mentor's ability, as seen in Table 29;

SP1 responded 'I'm confident in their ability to mentor though'. Ina similar way SP2 said 'I'm confident in them as a mentor'. SP3's response 'she oozes confidence' was taken at face value and was also positive, however a limitation of relying on transcription is that tone and insinuation can be missed. These declarations of confidence were regardless of whether they were aware of their mentors' attendance at the training or not. Respondents also all thought that their mentors attended the training provided. SP1 suggested that the mentor training should be compulsory for all mentors. Whilst this would be ideal, it is not something that the university could insist upon or enforce. None of the respondents had ever seen their mentors refer to the mentor handbook provided.

5.5.4 Research Question 2

This question asked: What factors may influence the relationship between the mentors and mentees? As shown in Table 24 above the corresponding interview questions are presented, followed by the corresponding relevant questionnaire responses as detailed in Table 25.

5.5.4.1 Questionnaire findings and discussion

The mentors were asked to detail some of the good practices that they think they demonstrate within their mentoring, in support of answering research question 2. Their responses are displayed as a Wordle™ in Figure 5.6.

Figure 5.6 – Good practice characteristics of mentors

All respondents provided plenty of detail within their free text responses, but only the key words are included in the Wordle™. Figure 5.6 shows that the mentors were able to identify strengths within their mentoring. The word *communication* can be seen prominently in Figure 5.6. When this word was reviewed in context, this communication referred to the liaison between mentors and the university staff. The other words that feature with equally high prominence are: *organised*, *reflective*, *time*, *current* and *hands on*. The prominence of the words *approachable* and *communication* in question 3 (Figure 5.6) could be bracketed alongside *being supportive*, as it is mainly for the students' benefit and support that the mentor communicates with the university. Sambunjak (2009), Hall (2008) and Clutterbuck (2011), who all list desired traits of a mentor, did not offer the word *support*. Reflecting on

this, it is important to ask for further expansion on words such as *support* to understand what it really means.

Following on from asking about the positive traits that a mentor might have, this question asked respondents to consider what, if anything, they would like to do differently within their mentoring if there were no constraints. Figure 5.7 shows the Wordle™ produced.

Figure 5.7 – What would a mentor do differently?

Figure 5.7 shows *more time* most prominently, emphasising that mentors would like to spend more time with the student whom they are mentoring.

The responses to these two questions from the mentor questionnaires has identified that the factors which may influence the relationship between the mentors and mentees (Research question 2) are, communication between the mentor and mentee, being organised and reflective. The mentor having current knowledge and giving the student hands on experience may also positively influence the relationship. The overall factor as shown by the questionnaire responses so far is 'time', with 'increased time' being spent together having the potential to positively influence the relationship between mentor and mentee.

This led onto the next question (Question 5) which asked what, if any, constraints do you encounter in your mentoring?

When asked about constraints, mentors were able to select any from a pre-provided list. Only the responses selected by mentors are displayed in Figure 5.8. Options with no responses were: 'none', 'lack of support from university' and 'other'.

Figure 5.8 – Constraints encountered within mentoring
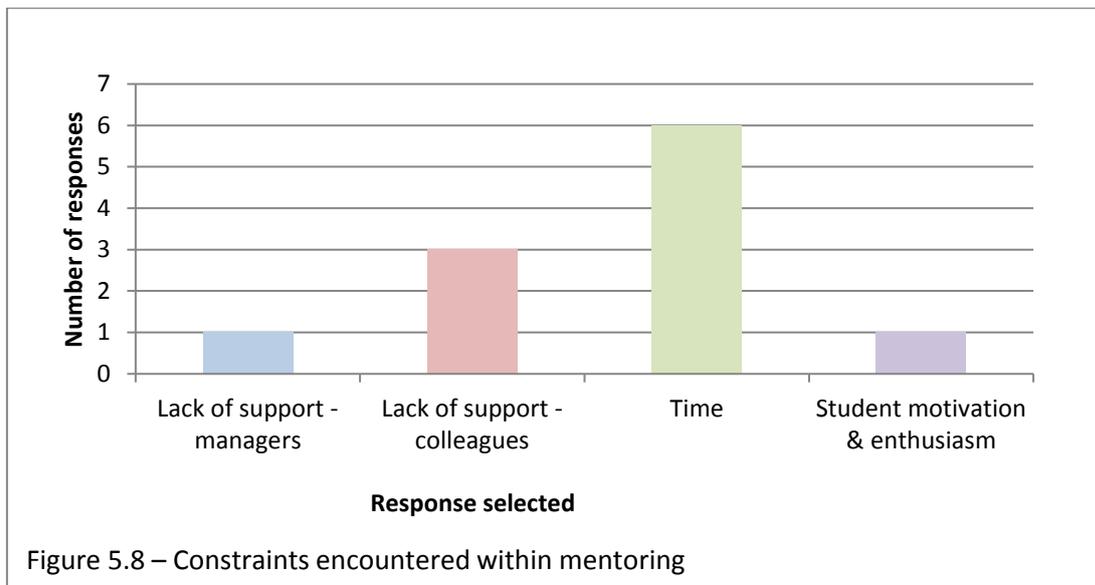
A flaw with the questions was that the option 'student motivation and enthusiasm' did not state if this is a lack of or too much of; regardless of which, it was selected as a constraint. Time is again identified as a factor, from this question it can be surmised that a lack of time spent together can adversely influence the mentor / mentee relationship, thus further answering research question 2.

Questions 4 and 5 are linked, since both are concerned with the constraints that mentors encounter in the mentoring process. *Time* is a factor within mentoring that appeared in both the strength and constraints responses. A lack of time was cited by all the mentors as a constraint to their mentoring. None of the investigated literature discusses time as a factor in effective mentoring but it is acknowledged as a limitation to mentoring by Moseley and Davies (2007), Holmes et al. (2010) and Sumbunjak (2009).

Staff shortages within the National Health Service (NHS) have been well documented in the press in the past few years. Sonography remains on the government list of occupations with significant shortages (UK Government, 2014), so it may be deduced that sonographers are busy, with limited free time available for teaching. Lack of support from departmental managers was cited by MP3. Departmental managers are responsible for both maintaining the service and training new staff. Allowing extra time for teaching remains a balance between current pressures versus long-term workforce planning. Respondents MP4, MP5 and MP6 stated that some colleagues were unsupportive of their mentoring role. This could also be due to a lack of time – since, if a mentor is spending longer teaching their student, then other sonographers have to cover their responsibilities. The training of a student sonographer

should not be detrimental to a patient's diagnosis and treatment. Other sonographers might be required to scan extra patients in order to ensure that all patients have their examination within the required time frames. In question 3, mentors also reported lack of time to discuss the student's progress with colleagues, so having two staff members available for such discussions would impact on the patient throughput of the department, but these are again necessary discussions.

Students are encouraged to work with a range of sonographers to learn different techniques and gain knowledge from different perspectives. For the 2014-2015 academic year, a new formative portfolio was implemented for the students and sonographers to complete while on clinical placement. It involved a mechanism for feedback from a wider range of sonographers. This was planned to help the time constraints relating to staff discussion and feedback. The revised portfolio also included detail of mock assessments to be undertaken by the mentor within the clinical department. This is based on the other constraint mentioned, in that mentors would like more opportunities to undertake mock assessment and feedback to staff at the university. Portfolios are internally reviewed annually by university staff, mentors and students: the new incarnation of portfolio was well received and a similar format was continued for the 2015-16 and 2016-17 cohorts. More detail about the changes to the portfolio in support of answering research question 1 are discussed in Chapter 7.

A lack of opportunity to teach was mentioned by half of all mentors as a constraint. Whether or not it is within the mentors' remit to teach is still under discussion. In the review of the NHS that came into force in 2004, teaching was seen as a part of all staff jobs. Specific payment for teaching of students was removed and instead given to all staff on the understanding that such teaching is part of everyone's role. The teaching of a sonographer therefore should be undertaken by all staff, not just the assigned mentor.

Previously, time constraints were mentioned prior to asking about the ideal relationship between mentors and students and Kowtko (2010) explains how lack of time and availability of a mentor could be problematic. She advocates the use of electronic media in the mentoring process, in addition to face-to-face meetings, as this could be a way to help develop the relationship between the two parties and alleviate the potential limitations in mentoring. However, electronic communication still takes time and some of the sensitive areas for discussion within ultrasound are best suited to face-to-face discussions. Whilst there is no

literature supporting face-to-face discussions specifically within ultrasound, all training related to antenatal care results takes place face-to-face (www.arc-uk.org), so it would follow that discussions with students surrounding related matters are best undertaken face-to-face also.

Question 6 of the questionnaire also facilitated answered the second research question, asking: Please can you describe what you consider to be the ideal relationships between mentor and student and if this changes over time?

Figure 5.9 shows a Wordle™ representing the responses provided by the mentors when asked about their ideal mentor/student relationship.

Figure 5.9 – The ideal mentoring relationship

Time is the word that stands out most prominently in Figure 5.6. All respondents mentioned time, in the context of spending time together building a relationship, along with time for learning and teaching. Other prominent words shown in Figure 5.6 - considering their context, a mutual, two-way and respectful relationship between the mentor and student were mentioned by five mentors as an ideal factor of the relationship. Of these, four made mention of the fact the relationship changes over time. In the early stages of the academic year, the mentor takes the lead, but as the student progresses they then take the initiative in discussions and problem solving.

The word *disliked* is another word that stood out on viewing Figure 5.6. When considered in context, it was only used by MP1; however, they used it multiple times. It was expressed in relation to the changing nature of the relationship between the mentor and the student, with the student struggling to take constructive criticism and answer questions as they became more confident in their own abilities. Other respondents made mention of similar issues but utilised different terminology. This clearly highlighted a limitation of solely relying on the Wordle ™ to guide even initial analysis. Other measures taken were to colour code text on a line-by-line basis in order to facilitate identification of themes.

Four respondents – MP2, MP3, MP5 and MP6 – explained how relationships between them and their student changed during the course. The responsibility for the learning changed from mentor to student during the duration of the relationship – potentially affecting their relationship and thereby linking with research question 2. The literature makes mention of the role of responsibility in the mentoring relationship: Stagg et al. (2012) and Weinburg and Lankau (2011) both place the responsibility for a student's learning firmly with the mentor. This contrasts with the findings of Veronneau et al. (2012), who highlight that one of the most important factors in the mentoring relationship is when a student is the one who takes initiative and responsibility for their own learning. The general literature does not consider the change in responsibility over time, so it could be that ultrasound mentors are unique in this transition. This changing nature of the relationship was also noted in terms of friendship developing. There was disagreement between the responses of the mentors regarding friendship. MP1 stated: 'I do not feel that I need to be friends with a trainee, however a good relationship is beneficial.' Whilst MP3 agreed with the need to have a good relationship, they stated: 'Unfortunately as time goes on students become over friendly and a little less respectful of your opinions.' MP5 commented that 'friendships may develop' but then proceeded to explain that this should not be at the detriment of the ability to give constructive criticism. Any lack of respect or over reliance on friendship can lead to conflict arising between the mentor and student. Straus et al. (2009) explain that a failing relationship between mentor and student could also cause ongoing problems, and Eby et al. (2010) suggest that in the training of mentors, strategies for conflict management should be taught in case such conflicts occur, to prevent them from escalating.

Although only mentioned by MP1, the informal nature of the ideal relationship is worth considering in line with the literature. MP1 said that they deliberately aimed to keep the

relationship 'as informal and fun as possible'. Within the literature, there are differences as to whether formal or informal mentoring has the most advantages. Nick et al. (2012), Kowtko (2010) and Meinel et al. (2011) discuss the advantages and disadvantages of both formal and informal mentoring but do not draw conclusions as to which approach they consider best. Weinburg and Lankau (2011) and Wang (2010) both clearly advocate the formal nature of the mentoring process as the ideal: it is articulated that this formality helps to maintain the relationship. In a previous question, mentors had said that adaptability was one of their strengths, so they should be able to adjust the formal/informal stance depending on the stage and different needs of the students, as advocated by Morton-Cooper and Palmer (1999).

Table 30

Question 1: Experiences of the mentoring received during ultrasound training	
Respondent	Key points from response
SP1	My mentor was very supportive in teaching me
	They teach me different techniques
	I didn't get enough time with my mentor
	I'd like more time and for them to take more responsibility
SP2	Both my mentors do things very differently
	Experience changed over time, as I improved, they let me loose
	Needed more time with my mentors
	I would like the superintendent to have watched me scan more
SP3	Started off supportive but turned sour when got frustrated with me
	They were good at backing me up when I had to give bad news
	They told me my learning was disgraceful, but I thought I was trying hard
	I wish they didn't make every day like an assessment day

Table 31

Question 2: The relationships between student and mentor	
Respondent	Key points from response
SP1	The relationship changed over time. Once I'd started to prove my knowledge they treated me as a colleague
	They became more friendly
	It wouldn't have worked if we didn't get on
	I didn't have any choice on who my mentor was
	I'm happy about them doing my assessment
SP2	I got on with one better than the other
	With one it was difficult, I always felt nervous
	The relationship changed over time, they respected me more and at the end treated me as the same level
	I had no choice about my mentors
SP3	Relationship changed gradually as though I wasn't up to par
	They stopped helping me
	No choice about them and I asked to change
	They were not proactive in my learning

5.5.4.2 Interview findings and discussion

The student interview responses from questions 1, 2, 4 & 6 are presented below as they directly related to answering this research question. This section will first present, then discuss findings that arose specifically from the interviews as presented in Tables 30-33.

Table 32

Question 4: What would your priorities be if you were to be a mentor?	
Respondent	Key points from response
SP1	I'd take it seriously
	Increased responsibility
	I'm not ready to do it yet but yes in the future
	I've got some of the key characteristics needed such as teaching, good knowledge, not aggressive, supportive, interested
	I'd give enough time and I'd attend the training
SP2	Ask if ok or struggling
	I'd spend more time with them
	I'd tell them when they were good and tell where to improve
	I'd ask them questions and do mock assessments
	I would like to be a mentor in the future and I think the qualities needed for this are fairly newly qualified, perspective, relaxed, wanting to help and understanding expectations
SP3	Yes I'd absolutely want to be a mentor
	I'd discuss their learning and ask how they are feeling
	I'd struggle with negatives
	I'd link more with university

Table 33

Question 6: Additional comments about the mentoring of ultrasound students?	
Respondent	Key points from response
SP1	It's a balance.
	Need to realise responsibility.
	Should make attending training compulsory.
SP2	There should be a 3 month preceptorship after you have qualified sort of easing you into it gently.
SP3	I think consistency is quite important, I did feel moving around to various different machines with various different people, where now looking at it was good, at the time I felt completely overwhelmed, different buttons in different places and I feel that perhaps if I had stuck with one person and got their routine it would have been more beneficial at the beginning.
	Comparing with other students mentors I feel I've had a very even keel ride of it.

The comment in Table 33 regarding comparison with other students' mentors shows that students discuss their mentoring experiences with each other and are able to recognise strengths in their own mentors as a result.

Time, or more specifically a lack of time, with their mentor was mentioned by SP1 and SP2 in answers to both questions 1 and 2, shown in Tables 30 and 31. SP1 responding to being asked if they would have liked there mentor do to anything differently with 'I didn't get enough *time* with my mentor - I think that is it, just more *time* with my mentor and them take more responsibility for you.' When asked about the key characteristics that a mentor should have *time* was also mentioned when SP1 said 'I think they overall need to be supportive, um…have a keen interest; an interest in the student and also in teaching. And also enough time to do it.' When SP2 was asked about any examples of bad mentoring, they responded 'initially I didn't get a lot of *time* with the mentors', when asked whose fault this lack of time together was the response was '(Name removed) is a great mentor but also has other roles to take on so she sometimes doesn't have *time* with students and (Name removed) is part time so sometimes no *time* with (Name removed) but that is just natural with the department…. again I don't

always get scan *time* with her'. When asked if there was anything else SP2 wanted to say about mentoring, time was again mentioned as she said 'Maybe still a bit more *time* with the mentor'. In question 4, seen in Table 32, when asked about what they would make as a priority if they were to be a mentor, again SP1 and SP2 mentioned increased time together. No mention of time as a limitation was made by SP3; this could be due to the poor relationship between SP3 and their mentor, with SP3 reporting feeling upset by comments such as 'I think she felt that I wasn't up to par with my learning' or 'there was one point where she said that my learning was disgraceful. Which really upset me because I thought I was trying hard'.

The responses from SP2 above, do highlight the clear limitation of solely relying on a Wordle™ as a means of analysis, since mention of someone working part time would include this mention of time, albeit out of context giving a false impression of the frequency of time being mentioned. Whilst SP3 did not mention time as an issue, the word time was evident in their interview transcript as it was used in the context of 'at the time I felt completely overwhelmed' and 'in a couple of years' time', again highlighting why Wordle ™ alone was not used as the method of analysis as context needed to be considered.

All respondents mentioned how differences in teaching and mentoring affected them. SP1 explained how they viewed the different techniques they were taught as a positive experience by saying 'teaching me their own methods however also teaching me the ways in which the university would like me to do things so that I've not just been taught from their perspective which should hopefully help me to pass. Even if I did it in the way my mentor taught me I could explain how else to do them'. SP2 had two mentors and explained how each had a different approach to their mentoring 'When I first started (name removed) was very focused on saying you know let's get the kidneys sorted this week but then when I went with (name removed) she would test me and things like what is an ovary measurement, what is polycystic ovaries? Things like that. So different, different from each' SP2 could appreciate the positives in both approaches. SP3 had an alternate perspective of the different staff and equipment they worked with. SP3 viewed the differences as a barrier to their learning and explained how they felt that more consistency would be important, she said' I think consistency is quite important, I did feel moving around to various different machines with various different people, at the time I felt completely overwhelmed, different button in different places and I feel that perhaps if I stuck with one person and got their routine it would have been more beneficial at the beginning'. Due to the unique nature of human beings, every person is bound to have a

different approach to their scanning and mentoring. All ultrasound machines from all manufacturers have the same controls; they are often called different things and the buttons to operate them located in different places. Student sonographers commonly struggle with these differences in the initial stages of their training but most adapt to the range of ultrasound machines relatively quickly. Through watching a range of sonographers, each student can select the good aspects they see in others and combine them in order to develop their own individual style.

Supportive was a term mentioned by SP1 and SP3 which again needs to be considered in the context it was said. SP1 mentioned support in relation to support for teaching them saying 'So for the first year I did perform a lot of Obstetrics and Gynae with my mentor who was very supportive in teaching me. In my second year my mentor was supportive however I tended to do a lot of the practical aspects and learning from other sonographers within the department' and 'I think they overall need to be supportive, have a keen interest; an interest in the student and also in teaching.' SP1 also said about their mentor 'It's hard to tell between differentiating a mentor to a teacher because they do teach'. SP3 reported that 'Initially I found it really supportive and everybody was very very kind and helpful and willing to help. And then after a while it rather petered out and it turned a bit sour.' This would lead me to assume that SP1 associated a teaching role with their mentor, whereas the traditional definition of mentoring does not involve teaching. This made me consider if teaching was seen or if it should be viewed as a part of the expectations of a mentor. Teaching can be linked with learning, as SP3 stated: 'they were not proactive in my learning, I felt like I couldn't learn when I was with her because I felt it just wasn't conducive to be [*sic*] a learning environment being with her'. This was an interesting statement, as at postgraduate level one assumes that the student should be the one who is proactive in their own learning, rather than relying on their mentor for this. If SP3 does not see that they should be proactive in their own learning, this may explain why the relationship between them and their mentor soured over time. SP2 twice mentioned the importance of understanding expectations saying 'I think it's because we have had so many students from our department they think they know what is expected' and 'whereas that's expected isn't it?' and 'maybe making it more clear at the start of the year what is expected' If a mentor and student have different expectations about each other's role, this could lead to friction. This encouraged me to consider exploring the expectations of both

the mentor and the student from their own and each other's perspective as part of the main study.

Another theme that emerged from all respondents was the changing nature of their relationship with their mentor over time. In Table 30, SP1 and SP2 described how, as they gained in experience and expertise, they were treated more like colleagues than students and the relationship with their mentor improved, as articulated by SP1 'once I had qualified in part and almost proved my knowledge I think that changed the barrier between being more colleagues than having a mentor, as such'. SP2 explained the changing nature of their relationship with their mentor describing 'I think through the year the relationship changed, in the fact they respected me more in the fact that they would ask for my opinion as well. I think they treat the same level now'. SP3 explained the changing nature of their relationship in a negative way; they perceived it deteriorating as the mentor became frustrated with the student's lack of progress, to quote 'I just felt that my mentor got frustrated with me frequently and didn't do anything to try to combat it.' SP3 was the only respondent whose mentor also responded by completing the questionnaire, and this raised some interesting issues. The corresponding mentor was MP1.

Of the mentors who responded, MP1 had been involved in the recruitment and selection of SP3 as a student sonographer. I do not suspect that this involvement contributed to the poor relationship between them both, as other mentors who were involved in selection and recruitment did not have similar difficulties. However, MP1 went on to explain that they had not volunteered or been given a choice about being a mentor. MP1 was also one of only two mentors who did not report any passion or interest for mentoring. MP1 has never attended the mentor training session and detailed that they would have liked more 'Information on teaching styles, setting goals, managing difficult situations etc.'. These are all subjects that are covered during the training. This might imply that MP1 may have recognised the conflict within the mentor relationship. MP1 was also the mentor who stated that 'On the whole I normally try to make the experience as fun/informal as possible.' This does not match with SP3's perception of feeling 'as though they were being assessed on a daily basis'. It is thought that these factors may have contributed to the breakdown of the mentoring relationship; however, other external factors that cannot be captured may have also contributed.

5.5.5 Consideration of potential effect of pass rates

Whilst not directly related to one of the research questions, consideration of pass rates was made. In question 5, student were asked if they thought that their mentor affected their ability to pass the clinical assessment, responses shown in Table 34.

Table 34

Question 5: Did your mentor affect your ability to pass the clinical assessment?	
Respondent	Key points from response
SP1	Passed first time. I could have passed without my mentor but not so easily.
SP2	Passed first time. Yes mentor helped but my personality did too.
SP3	Failed twice and department would not support to re-enrol. My mentor did affect me but not in a positive way.

It is custom and practice within this University's ultrasound programme that the mentor has involvement in marking the clinical assessment. No respondent raised concerns with regard to their mentors undertaking their summative clinical assessments, although Kay and Hinds (2005) suggest that mentors should not be responsible for marking their students' summative assessments. SP1 even said they were happy about their mentor being the one to do their summative assessment adding 'I don't feel my mentor would back me up if I wasn't safe to practice'. Consideration of the role of the mentor within assessment is made in Chapter 7.

Table 30 indicates that none of the respondents had been given any choice or input into who their mentor was. SP1 and SP2 did not include any detail as to whether they were happy with this. SP3 explained how their request to change mentors was refused saying 'I was told that was one of the reasons I couldn't change was because nobody else had attended the mentor training'. It appears that SP3 places the blame for their failures in the clinical assessments on their mentor and anticipated that a new mentor would facilitate their passing, indicating a lack of reflection on their own abilities.

5.6 Discussion

This section will discuss two areas in order to link back to the aims of the pilot study presented in Section 5.2. Firstly, the combined findings of the questions and interviews will be discussed in relation to the secondary aims. Following this, there will be a reflection that will focus on

evaluation of the foremost aim of the pilot study in testing the procedures and data collection tools prior to the main study. This reflective section demonstrates how the pilot study informed the development of the main study.

These findings can be considered characteristic of the wider population due to the fact that those invited to take part represented an equal distribution of reporting, both positive and negative experiences of mentoring and being mentored.

The responses of the students when interviewed showed opinions that were markedly different from those of their mentors. When they were asked to explain the strengths they saw in their mentors, they were succinct and brief in response. SP1 and SP3 said that their mentors were 'supportive' (Table 30). The word *supportive* is not shown particularly prominently in Figure 5.6, found in Section 5.5.4. This could indicate that the mentors do not see themselves as supportive. However, when the other responses from the mentors are examined, there are many other strengths listed by the mentors that could be catalogued under the heading *support*. It would have been helpful if the students could have explained further what they meant by 'supportive' – had more detail been given, this may have allowed some correlation with the mentors' responses. In the interviews for the main study, when a student responded with 'supportive' or another adjective as a strength, they were asked to expand on this to explain what they meant.

One area where the responses of the mentor and students agree, which is also referenced by Hall (2008) and Morton-Cooper and Palmer (1999), is with regards to teaching and providing tutorials. Teaching was listed as a strength of theirs by 67% of students and 83% of mentors. But is teaching part of the remit of the mentor? Finding a true definition of the role of a mentor presents a challenge, as some use the term interchangeably with supervisor, assessor or teacher; different professional groups also use the term to mean different things. The fact that Sambunjak et al. (2009) and Clutterbuck (2011) do not list teaching as a necessary trait of a mentor has shown that there are indeed differences in the expectations of the mentor role. The characteristics of a mentor have also been considered within the main study. Tables 57-60, found in Section 7.4.1, present the ideal characteristics according to the literature, alongside findings of the pilot and main studies from this chapter and Chapter 6.

The mentor training provided within this institution for the ultrasound mentors prior to 2014 did not make mention of teaching as part of the role. Defining the role and expectations has

been made more overt to the new mentors in training. The mentors are also sonographers and so may teach students as part of their job; however, this interaction between mentor and student in different guises may lead to a blurring of the boundaries of the role. There will be times when the student and mentor are working together but not in the capacity of mentoring. This highlights the importance of the mentors attending the training provided to ensure they are cognisant with the remit and requirements of the role.

Another strength noted by 50% of mentors is their ability to ask pertinent questions of the student and to encourage the students to question them. Although questioning is not mentioned within the literature as a desired attribute within mentoring, it is alluded to by making mention of being and having understanding, setting goals and being honest and trustworthy (Sambunjak et al., 2009) and demonstrating and modelling good practices (Hall, 2008). These are all characteristics that may help to develop the questioning nature between the two parties. Hall (2008) lists personal attributes as a desired characteristic of a mentor, but does not expand about which attributes are desired. Clutterbuck (2011) and Morton-Cooper and Palmer (1999) make allusion to, but do not mention, specific ideal personal characteristics of someone who is mentoring. Sambunjak et al. (2009) require a mentor to be someone who is altruistic, understanding, patient, honest, trustworthy, non-judgemental and reliable. However, this list of attributes does not have to be exhaustive; the mentors when questioned listed many personal attributes which they believe help to make them more effective mentors, not all of these are mentioned in the literature, but they all seem reasonable and are characteristics which support the integrity of a mentor.

It was anticipated that recognition of some of the personal attributes that a mentor might have might have been acknowledged by the students. The students perhaps also needed to be more receptive to being aware of these personal traits which make an effective mentor and recognising them within their own mentors. This understanding of ideal characteristics is something that has been incorporated into the mentor training and into new student induction. The intention is of increasing awareness amongst mentors and encouraging students to think about desired characteristics, which may help students appreciate the qualities in their mentors. Where the mentor does not possess these traits it may help them be aware of the need to develop them, and as not all the ideal characteristics can be learnt, it might indicate that the mentor is not the best person to be undertaking the mentor role.

The work of Baranik et al. (2010) indicates that being a mentor, or having a mentor, can have a positive impact and result in higher levels of job satisfaction for both the mentor and student, compared with those not in a mentoring relationship. On the other hand, Cuesta and Bloom (1998) conclude that there is no significance in the relationship between the role of mentoring and increased job satisfaction, and that job satisfaction is not dependent on the quality of the mentoring received. On reflection, it might have been prudent to ask the mentors about their job satisfaction, in order to find support for either the work of Baranik et al. (2010) or Cuesta and Bloom (1998).

5.7 Meeting the study aims

From this discussion it can be concluded that the two secondary aims of the pilot study were met. The responses have also facilitated starting to answer the two overall research questions. The features that might affect the mentoring relationship have been found to be: the characteristics of the mentor, time constraints and the nature of the support offered.

There is greater clarity regarding the process of matching the mentors and students. This study has found that none of the students had any opportunity to input into the choice of their mentor. Of the six mentors who responded, five reported being involved in the selection of the student who they mentored. The literature relating matching mentors discussed in Chapter 2, Section 2.17, provided mixed opinions. Given the small sample size of this study, its generalisability is limited and the findings will not be specifically included within the main study, as it is surmised that no different information will be gained.

The foremost aim of the pilot study was to test the procedures and methods, to ascertain if the data collected would be appropriate to transfer to the main study. A reflection on the issues will follow in order to evaluate this aim.

5.8 Reflection on the pilot study

For this section I will use the Driscoll (2007) model of reflection as a basis. Driscoll advocates reflecting in three stages: What? So what? Now what?

5.8.1 Questionnaire design

What? The wording of some of the questions within the questionnaire was unsatisfactory.

So what? Not all the predetermined responses given actually answered the question asked. Question 1, which asked how they were selected to be a mentor, had one predetermined option: 'I'm passionate about mentoring and teaching students' selection for a role which is not directly related to passion for that role. Teaching and mentoring were bracketed together when they are two separate roles.

Now what? It might have been better to include a separate question asking how they felt about being a mentor – this might have gained responses about possible passion and enthusiasm towards mentoring. Another separate question could have been included to ask what they considered to be part of the mentoring role; it would then have been possible to determine if teaching were viewed as part of the mentoring role or not. The predetermined responses also made assumptions regarding the answers that respondents might give. For the main study, the questions regarding mentor selection were altered to open questions with space for free text responses. In order to gain information regarding understanding of the mentors' perceptions of their role, they were asked to list some of the duties which their mentoring role involved. I will also ensure that all the questions facilitate meeting the study aims.

5.8.2 Misplaced questions
What? Questions 7-10 of the questionnaire and questions 3 and 4 of the interviews did not relate to the aims of the study.

So what? The analysis and discussion of these findings are better situated within Chapter 7, where changes to the mentor handbook and training are discussed.

Now what? The wording of these questions could be bracketed as an audit or evaluation of current ultrasound practices at this University. Asking about the mentor support was necessary; however, the questionnaire might not have been the most appropriate format in which to do this. Evaluation of the mentor training is now sought anonymously from attendees at the end of the session. The portfolio is evaluated by staff and students towards the end of each academic year. Based on feedback, the mentor handbook is now distributed electronically rather than in paper form; this also decreases costs and environmental impact. Rather than discuss the findings of these questions within this chapter, there are analysis informed changes that are discussed within Chapter 7 instead.

5.8.3 Questionnaire layout
What? It was identified that there was not enough space provided for the free text responses.

So what? Respondents may have limited their answers to fit with space provided. This may have resulted in missing information from the study.

Now what? The questionnaires were sent electronically; however, none were completed electronically. Respondents printed the questionnaires before completion. Whilst electronic dissemination might have helped the response rate, it did not appear to make it easier for the respondents to complete. An adjustment made prior to the main study was that the free text response boxes were enlarged. A comment was added to all questions requiring a list response, stating: "You can add or remove rows as required." For the main study, it was advised that electronic completion and return of the questionnaires was possible.

5.8.4 Questionnaire return
What? Questionnaires were returned up to three months after distribution.

So what? Analysis of the questionnaire data had commenced. Given the low return rate, late returns also needed to be included, which resulted in increased time taken with analysis.

Now what? For the main study a date was set for return. Reminders were sent after this time to non-respondents. Data analysis commenced after the reminder return date. The use of reminders helped to improve response rate slightly. No returns were received after the set return date.

5.8.5 Sample population
What? Feedback from two of the three students interviewed indicated that they would not have agreed to the take part in the interview had they not been near completion of the course.

So what? Students raised concerns that being honest about their mentor during interviews before the end of the course may have jeopardised their future.

Now what? The first change that was made as a result of these comments was to reassure all participants in the main study about the confidential nature of their responses. The second change was in relation to the timing of the interviews. Rather than interview students at the outset, or during their studies, it was decided to wait until the end of the academic year. The advantage of this was that they would have had a significant period of time to experience mentoring and thus have more examples to discuss. Consideration was also given to whether

a person other than the researcher should undertake the data collection for the main study. This would ensure that complete anonymity of participants was maintained. However, another person would not have the same capacity to prompt or reword questions if required. When interviewing students, clarification and expansion of answers will be sought. For instance, what do students mean by support? Do they all mean and expect the same thing? After consideration, it was decided that I would conduct the interviews myself as the ability to prompt outweigh the other issues. By the end of their course I have built up a rapport with the students, which should facilitate an honest discussion. Whilst this rapport can be beneficial, I needed to be mindful of the concerns of Oppenheim (1992), in that having too much rapport can lead to joking and not being taken seriously.

5.6 Summary

Following the reflection and alterations to questions, it can be concluded that the aims of the pilot study were met. The data collection methods were appropriate and provided suitable data to be analysed. This analysis facilitates answering the research questions and overall aims stated in Chapter 1.

In agreement with the literature, 89% of the mentors questioned had some involvement in the selection of the student they were mentoring. This helped to maintain a positive and harmonious relationship.

Any suggestions for improvement to the training and documentation within the ultrasound course at this University have been considered. A new portfolio has been designed to help maintain correspondence between the mentor, student and university staff. The portfolio will continue to be reviewed and refined as required.

Upon completion of the pilot study, the main study could commence. The following chapter outlines the methods, findings and results of the main study.

Chapter 6. The Main study

6.1 Introduction

The main study involved a two part data collection process, which learnt from and built upon the outcomes of the pilot study. The pilot and main studies have similar aims and both enabled answering both research question presented in Chapter 1 and duplicated below:

1. What guidelines and support mechanisms may be shown to be effective in helping colleagues and students in mentoring practice?
2. What factors may influence the relationship between the mentors and mentees?

The previous chapter highlighted some changes that were required to the data collection tools prior to commencement of the main study, in order to ensure that meaningful data would be obtained. The pilot study could have been replicated in the same format; however changes were made to improve the amount and type of data obtained with a view to providing a greater depth of understanding of mentoring which facilitated answering the research questions more completely. The changes were applied to the questionnaire wording along with alterations to the interview format, questions and prompts. Students at the end of their course were invited to attend a semi-structured interview with myself to talk about their experiences of being mentored during their ultrasound programme of study. Questionnaires were sent to their mentors at the same time, asking about their experiences of being a mentor. Some of the same questions were asked of both students and mentors in order that responses could be compared and contrasted. The interviews were analysed thematically, with three main themes and six subthemes identified. The questionnaires were then analysed, taking into account these identified themes. In addition to the thematic analysis undertaken, an attitude rating analysis on the interview data was undertaken by me and another, and Cohen's kappa test used to compare the findings.

6.2 Aims of the main study

In order to answer the overall research questions stated in Section 1.6, through interviews and questionnaires, the aims of the main study were to:

- Investigate students' thoughts and opinions on the mentoring they received whilst studying a PG ultrasound course. This aim links to both research questions.
- Gain an understanding of the mentor's perspective of their role, considering strengths, constraints and relationships. This aim links to both research questions.
- Analyse the students' and mentors' responses, to highlight similarities and differences between them. This aim links to both research questions.

The findings of this study were intended to enhance and develop the mentoring training provided in order to further support mentors in their role through answering research question 1.

Research question two will be answered by identifying factors within mentors' and students' responses which may have an influence on the relationship between them.

Responses from mentors and students may help answer research question three, however this research question is now considered the least important. Whilst pass rates have some value, the support mechanism, guidance and relational elements identified in the first two research questions are considered by myself to be more important.

This chapter will be presented in the same format as the pilot study in that specific methods of the main study will be presented followed by the integrated findings and discussion, linked to the research questions.

6.3 Methods of the main study

The advantages and disadvantages of collecting data through semi-structured interviews and questionnaires has been presented in Section 3.5 and piloted as detailed in Section 5.4. Therefore those details will not be replicated here. This section will describe in detail the methods used for the two stages of data collection utilised as part of the main study.

6.3.1 Sample population

For the main study, the selected sample was taken from the 2014 intake of ultrasound students. With 11 students in the cohort, inviting all of them to attend an interview was realistic and achievable. Their mentors were sent questionnaires. If a student studies more than one clinical ultrasound module then they might have a different mentor for each module. So, some students had more than one mentor. Equally, some mentors were responsible for more than one student if their department was training multiple students at a time. The resulting potential sample size was 11 mentors. The inclusion criteria are shown in Table 35.

Table 35

Inclusion criteria - main study
Student inclusion criteria: • Commenced studying the HHMIRSDU one year PGCert or two year PGDip ultrasound programme in Semester A 2014   • Commenced studying the HHMIRSDU two year PGDip ultrasound programme in Semester A 2013 and had not taken part in the pilot study
Mentor inclusion criteria: • Being the mentor for a student who commenced studying the HHMIRSDU one year PGCert or two year PGDip ultrasound programme in Semester A 2014   • Being the mentor for a student who commenced studying the HHMIRSDU two year PGDip ultrasound programme in Semester A 2013

Following the pilot study interviews, informal discussions with the students who had taken part indicated that they would not have agreed to take part if their training was still ongoing. As a result, students who commenced the two year course in 2014 were excluded from the study as they had not finished the course.

Mentors and students who had taken part in the pilot study were excluded from the main study. The rationale for this exclusion was that the interviews and questionnaires for the pilot and main studies covered similar areas and it was deemed inappropriate to replicate the data

collection. Unlike the pilot study, no purposeful sampling took place: all students were invited to take part in the study. The demographic details of respondents are in Table 38, Section 6.12.

6.3.2 Selection and recruitment of participants

As with the pilot study, the questionnaires were sent electronically to mentors; the inclusion of a return date was added as the pilot study had highlighted that this was necessary. A participant information sheet was included with the email, a copy of which is in Appendix A. Mentors were advised that email return was preferable. Based upon the evidence from the pilot study, reminder emails were sent three weeks later to those who had not yet responded, to encourage a higher return rate.

Students were invited to take part face-to-face on an individual basis. Compared with the recruitment for the pilot study, I gave more information at this stage about the remit and potential benefit of taking part. If agreeable, they were asked to arrange either a telephone or face-to-face interview at a mutually convenient time.

For ethical reasons of ensuring anonymity and confidentiality, the clinical departments were not directly named. They were referred to by numbers and the prefixes S for student and M for mentor. An M was used to indicate part of the main study.

All who responded were included in the study, regardless of whether a response was also received from their corresponding student/mentor.

6.3.3 Interview design – for students

Continuing from the pilot study, the interviews were designed to be semi-structured in nature. Prompts and follow up questions were detailed as a reminder to ensure all areas of discussion were covered. I will now detail how the questions asked within the pilot study were revised for use in the main study, and provide a rationale for the alterations. The research question each question corresponds to answer is identified in brackets after each question.

1. **Pilot question**: Please can you tell me about your experiences of the mentoring you received during your ultrasound training?

    Revision for main study: Please can you tell me about your experiences of the quality of mentoring you received during your ultrasound training? (RQ2)

Rationale: The first question was altered to include *quality*. This was done to streamline the answers to focus on quality and to exclude a potentially generic response.

2. **Pilot question**: Please can you describe your relationship with your mentor?

   Revision for main study: Please can you describe what you consider to be the ideal relationship between the student and their mentor: (RQ2)

   a. at the start of the course

   b. during the course

   c. just prior to your assessment

   Rationale: Question 2 explained about the relationship with the mentor. Instead of asking specifically about their relationship, they were asked about the ideal relationship. They were asked about three specific timings in relation to the relationship. This change was made based on the findings of the pilot study, where SP3 in particular described the importance of change in relationship between the student and their mentor over time. The question was worded in this way to prompt students to consider changes over time and in the nature of the relationship.

3. **Pilot question**: The University provides a mentor handbook and mentor training for all mentors. What do you think should be included in the handbook and training sessions?

   Revision for main study: The University provides a mentor handbook and mentor training for all mentors. Do you know if your mentor attended the training? Did your mentor mention or make use of the handbook? (RQ1)

   Rationale: Previously asked a theoretical question about what they think the training should involve, and replaced it with specific questions to tease out the mentors' commitment to the training and their practical use of the handbook in mentoring

4. **Pilot question**: If you were asked to be a mentor in the future, what would you make as your priorities in this role?

   Revisions for main study: Please can you tell me some of the characteristics you think an ideal mentor should have? (RQ2)

   Please can you tell me some of the role/duties you think an ideal mentor should do? (RQ1)

Please can you tell me some of the characteristics you think a sonographer who is working with you should have? (RQ2)

Please can you tell me some of the roles/duties you think a sonographer should undertake when working with you? (RQ1)

In the future, would you be interested in being a mentor? (RQ2)

Rationale: Question 4 was altered to include more detail regarding the role of the mentor. The pilot study had identified that there was some crossover between the roles of mentor, particularly in also being an assessor and teaching sonographer, so there were specific questions to cover these aspects. Respondents were also asked about the sonographer role. Upon qualification, the respondents would be working as sonographers and by asking this question it was anticipated to prompt them to consider their role in this area. The questionnaire was adjusted in a similar way to consider the various roles within the ultrasound department. The understanding of the nature of the role of the mentor and supervisor, as discussed in Section 2.17 of the literature review, underlines the rationale for alterations to this question.

The pilot study investigated the characteristics of an ideal mentor; however, the main study took this one stage further by asking specifically about ideal characteristics. This was followed up by asking the students firstly to rank these for importance, and then to consider the characteristics from the mentors' perspectives. Mentors were asked the same questions; firstly to consider characteristics from their own experience and then secondly from the student's perspective. This understanding of others' perspectives was noted as important in the literature and in the pilot study, hence its inclusion here. (RQ2)

5. **Pilot question**: Did you pass your clinical assessment first time? Do you think the mentoring you are receiving will affect your ability to pass the clinical assessment?

   Revision for main study: Please can you tell me some of the characteristics you think the person performing your summative clinical assessment should have? (RQ2)

   Rationale: The revision of the wording for this question removed the personal element and potential for students to apportion blame to their mentors.

6. **Pilot question**: Is there anything else you would like to tell me about mentoring of ultrasound students? No changes made for the main study. (Potentially both research questions)

The following additional new questions were asked in the main study, with the aim of exploring a student's emotional response in addition to their tangible experiences of being mentored. These new questions also aimed to highlight that students should expect to be receiving both positive and negative feedback from their mentors.

- How did you feel when your mentor gave you positive feedback? (RQ2)

- How did you feel when your mentor had to give negative feedback to you? (RQ2)

On reflection, these two questions should have utilised the same wording so as to avoid bias or leading the respondent. The second new question would have been improved by rewording it: How did you feel when your mentor gave you negative feedback?

All the questions were developed to be open in nature. A copy of the interview questions with corresponding follow up questions is found in Appendix D.

6.3.3.1. Interview Location
Rationale for choice of interview location was detailed in Section 5.4.4. Building on personal reflection following the interviews in the exploratory and pilot studies, a more formalised strategy was developed as detailed below:

- Location/setting:
  - All face-to-face interviews took place in the same room, the ultrasound practical laboratory. This is a quiet, comfortable, private and neutral space with limited access, which would thus limit distractions. There is no telephone in the room. 'Do not disturb' signs were placed on the doors.
  - Where telephone interviews were undertaken, respondents were encouraged to find somewhere quiet and comfortable with limited distractions. However, the respondents' background environments could not be verified.
- Introductions were made where the participant was welcomed. The study remit was outlined, including the purpose of the research and interview.
- The format of the interview was explained with regard to time taken, prompts and discussion.
- Audio recording and transcriptions were explained.

- Anonymity numbers were explained. I also mentioned that questionnaires were being sent to mentors also and that responses would be matched.

- Confidentially within the thesis development was guaranteed.

- The signed consent forms were collected.

- Recording started and the interview commenced. The format followed was:
    - Standard questions with prompting.
    - Discussion style, so any other issues arising were explored.

- End of interview, recording was stopped and the participant thanked for attending.

6.3.3.2 Transcription

Analysing data from audio sources can be challenging and therefore it is common practice to transcribe such interviews before starting analysis (Braun & Clarke, 2013). A professional audio transcription service was employed to transcribe the interviews verbatim in this stage of the study. The transcripts were checked against the audio for accuracy and minor corrections and amendments made. Any mention of names or places of employment were removed to ensure anonymity. A direct verbatim translation was chosen without inclusion of paralinguistic details, as the analysis of these nuances is outside the scope of this study. There are some limitations to the employment of a professional transcription service. It is important to gain familiarity with the data and this can be more quickly facilitated by self-transcription, which can be seen as part of the initial stage of analysis; transcription services eliminate this potential stage of analysis (Braun & Clarke, 2013). In order to ensure I was fully cognisant with the data, the audio files were repeatedly listened to, along with re-reading of the transcripts.

6.3.4 Questionnaire design – for mentors

Taking into account the reflections on the pilot study, all the questions in this stage were open questions except one, which had a Likert scale (Likert, 1932). In addition to providing responses, the mentors were asked to rank their responses in order of importance. They were also asked what they thought the student's ranking would be. The rationale behind this was that greater depth of analysis could be obtained from ranking responses compared with listed responses. Asking them to consider another person's viewpoint was intended to add depth to the analysis. The questionnaire explained that responses boxes could be reduced or expanded as required. This was so as not to inhibit the response due to lack of room to write. A full copy of the questionnaire is found in Appendix E, which shows the format. The questions asked were: (linkage to research questions identified in brackets)

1. Please detail how you were selected to be a mentor? (RQ1)

2. Please explain how you felt when you were identified as a mentor? (RQ1)

3. What involvement did you have in selection of the student for training? (RQ1)

4. Please identify, by placing a cross on the scale below, your satisfaction with your level of involvement in the student selection. (RQ1)

5. Please can you list some of the characteristics you think an ideal mentor should have? (RQ2)

6. Please can you list some of the roles/duties your mentor role involves? (RQ2)

7. Please can you list some of the characteristics you think a sonographer who is working with a student should have? (RQ2)

8. Please can you list some of the roles/duties of a sonographer working with a student? (RQ2)

9. Please can you list some of the characteristics you think the person performing your summative clinical assessment should have? (RQ2)

For questions 5-9 the participants were asked firstly to identify the characteristics. Secondly they were asked to tick the three they thought were the most important in one column, and thirdly to tick the three they thought their student would identify as the most important in the final column.

10. Are the boundaries between mentors', sonographers' and assessors' roles clear? (RQ2)

11. Please describe how you feel when you encounter factors which impact on your mentoring that are outside your control? (RQ2)

12. Please can you describe what you consider to be the ideal relationship between mentor and student: (RQ2)
    a. At the start of the course
    b. During the course
    c. At the end of the course, just prior to their final assessment

13.   Please give an example of good mentoring you have demonstrated and describe how it made you feel. (RQ2)

14.   Please explain how you would feel if your student ignored you, did not respond positively or was unmotivated? (RQ2)

Space was then provided for any further comments about the mentoring, supervision and teaching of ultrasound students in clinical practice. (Both RQ's)

6.3.5 Data analysis

Prior to presenting the results of the data analysis, it is important to detail how the analysis was undertaken. There were numerous options available for data analysis and they were selected based on the type of data and methodological underpinnings of the study. A combination of three methods of data analysis was used in the main study: the rationale for this will be discussed.

A combination of interpretative phenomenological analysis (IPA) following the guidance of Smith et al. (2009), and thematic analysis based on the work of Braun and Clarke (2013) was utilised to classify themes within the data.

6.3.5.1 Interpretative phenomenological analysis (IPA)

IPA is a means of analysis where the data is phenomenological in nature, i.e. that it investigates participants' experiences of how they felt in real life situations, and which elements of this are deemed significant (Smith et al., 2009). The interviewee is assumed to be the expert on their situation (Creanor et al., 2007). According to IPA, the experiences are assigned to a hierarchy, and an element of hierarchical assignment was undertaken in both the semi-structured interviews and the questionnaire, where participants were asked to select the three most important issues from the list they had previously provided.

Smith et al., (2009) state that the ideal sample size for IPA is a maximum of six, although no rationale for this sample size is given. Creanor et al. (2007, p. 29) use IPA on a sample size of 22; however, they acknowledge that this "is a larger sample than would normally be recommended". Again, no rationale for the sample size is given.

In order to limit bias, it is advised that when using IPA, more than one researcher analyses and codes the data (Creanor et al., 2007). Resources were unavailable for multiple reviewers in this study.

Given the dispute of ideal sample size, along with advocating multiple reviewers, the strategy of using IPA was not considered particularly useful. The main element that I integrated into my analysis was the hierarchical element of selecting the three most important responses as detailed above.

6.3.5.2 Thematic analysis

A thematic analysis aims to identify patterns and assigns codes to similar patterns or areas; it is one of the most commonly undertaken methods of data analysis (Braun & Clarke, 2013). Identification of patterns or themes is considered to be a relatively easy skill to learn for novice researchers such as myself; however, one criticism of the method is that there are no hard and fast rules as to how it is done. This has led some to say is it not a high level method of analysis (Braun & Clarke, 2013). It is important to undertake a staged approach to ensure a deeper level of analysis and identify links between themes, rather than just allocate themes alone. Coding was undertaken using Microsoft Excel due to its local availability and my prior familiarity with the programme, compounded by lack of access to – and limited knowledge of – computer analysis programs.

6.3.5.3 Attitude rating of students

The rating of attitude is a means of undertaking a qualitative evaluation by applying a statistical test to support the thematic analysis previously undertaken (Greenleaf, 1992; Dodd, 1990). The aim of undertaking this is to objectively rank the respondent's attitude to mentoring by means of a Likert scoring system. The use of attitude rating is long established, with many published articles making mention of using it. To date, the published work has not provided detail of how to undertake the rating. Reliance on a website for guidance of such techniques should be used with prudence, as their content is not peer reviewed or verified in the same way an article can be. Therefore, the detail of how I undertook this was informed by academic guidance from the Psychology Department at the University of California (Sommer, 2006).

Fourteen statements were written by me regarding mentoring: these are outlined in Table 36. These statements paralleled the themes and contents of the interviews. They were then

ranked for direction in terms of whether they represented a positive or negative attitude towards mentoring and then presented in a randomised order. These were then allocated a score. Each interview was analysed for attitude rating by me and subsequently by a second reviewer.

The second reviewer was external to the study and thus was able to provide a confidential verification of the results. All data reviewed was anonymous. The person selected was familiar with academic papers and practices, and had experience of mentoring programmes within a different context.

For each statement, the most appropriate column was selected based on whether the interview gave the overall impression of agreeing or disagreeing with the statement. These were then scored and each student was given an overall mark which was representative of their attitude towards mentoring. The lower the overall score the more positive the student was about mentoring, and the higher the score the more negatively they presented their view on mentoring through the interview. The lowest possible score was 14 for someone who was positive about every aspect of mentoring. The highest possible score was 70 for someone who demonstrated consistently negative attitudes. The Cohen's kappa test was then applied to the scores from both reviewers to check for agreement and to eliminate bias. The complete attitude rating table for both reviewers can be found in Appendix F.

The statements in Table 36 were developed to cover a range of subject areas that either were discussed within the interviews, or arose from the literature review. They were also devised to align with the themes identified.

Table 36

Measuring intensity of attitude towards mentoring					
	Responses				
Statement	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
My mentor also teaches me	1	2	3	4	5
My mentor is organised	1	2	3	4	5
My mentor does not spend enough time with me	5	4	3	2	1
My mentor discusses images / examinations with me	1	2	3	4	5
I have confidence in my mentor	1	2	3	4	5
Sonographers know what to do with me	1	2	3	4	5
My mentor is a good mentor	1	2	3	4	5
My mentor is not interested in my training	5	4	3	2	1
Me and my mentor have different expectations	5	4	3	2	1
I'm happy that my mentor is also assessing me	1	2	3	4	5

I get good feedback on my progress	1	2	3	4	5
I know what I need to do in order to improve	1	2	3	4	5
I've had a bad mentoring experience	5	4	3	2	1
I think I'll be a good mentor	1	2	3	4	5

6.3.5.4 Summary of analysis

Table 37 illustrates the approaches used for data analysis within this study in comparison to the details by Braun and Clarke (2013, pp. 202-203).

Table 37

	Data analysis comparisons	
Stage	Thematic analysis according to Braun and Clarke (2013)	Data analysis used in this study
1.	Transcription	Professional transcription
2.	Reading and familiarisation, taking notes of items of potential interest	Reading and familiarisation, taking notes of items of potential interest
3.	Coding – complete across entire dataset	Coding – via keywords across entire dataset
4.	Searching for themes	Identifying themes and subthemes by analysing questionnaire responses
5.	Reviewing themes and identifying any relationship between them	Reviewing themes from interviews and questionnaires. Identifying any relationship between them. Including hierarchical element as per IPA
6.	Defining and naming themes	Defining and naming themes
7.	Writing and finalising analysis	Attitude rating and using Wordle™
8.		Finalising analysis. Writing up took place concurrently with the above stages

Detail will be provided as to how the themes and subthemes were identified in Section 6.13. The findings of the interviews will firstly be discussed under the heading of the six subthemes that were identified. Throughout, any relationship to the three main themes will be identified by the use of *italics*. The second part of the analysis will be a qualitative evaluation of the mentees attitudes. There will then be a discussion of the findings of the attitude rating before the final part of the discussion, which will consider the findings as a whole.

6.4 Findings and Discussion

The demographic details of the student interview and mentor questionnaire responses are presented first. This is followed by presentation of the findings of the student interviews and mentor questionnaires, which are linked to the two research questions. Discussion of both questionnaires and then interviews follows according to the linkage to the research questions.

6.4.1 Student interview demographics

All eleven students in the cohort who were approached and consented to take part in an interview, giving a 100% response rate. Five responses were received from mentors, giving a response rate of 45%. The demographic details of the students and mentors were not collected as it was not considered important at the time. Retrospective demographic data was collated for the student respondents and is provided in Table 38.

Table 38

Demographic details of student respondents – main study						
Code	Gender	Gender of mentor	Age bracket	Years qualified	Background	Response received from mentor and code
SM10	Female	Female	50-59	>15	Radiography	No
SM11	Female	Female	Under 30	<5	Radiography	Yes (MM11)
SM12	Female	Female	30-39	10-15	Radiography	No
SM13	Male	M and F	Under 30	<5	Radiography	No
SM14	Female	Female	Under 30	<5	Radiography	No
SM15	Female	Female	30-39	10-15	Radiography	Yes (MM15)
SM16	Female	Female	Under 30	5-10	Radiography	Yes (MM16)
SM17	Female	Female	Under 30	5-10	Radiography	No
SM18	Female	M and F	30-39	10-15	Radiography	Yes (MM18)
SM19	Female	Female	40-49	<5	Radiography	Yes (MM19)
SM20	Female	Female	40-49	>15	Nursing	No

There was a concern that asking such details of mentors may affect the response rate hence this detail is not available. Following reflection from the pilot study, the codes for the mentors and students align for ease of identification and this in also shown in Table 38.

It is worth noting that the demographic data in Table 38 is not typical of a normal cohort. Traditionally there is more variety in background professions, i.e. radiography, midwifery and nursing.

6.4.2 Identification of themes from the analysis

A three-staged approach was undertaken in order to ascertain the final themes. Upon initial analysis of the data, keywords were identified within the transcriptions after filler words such as *um* and *er* were removed; the frequency of their occurrence was then noted. The ten most commonly occurring words were: *think, know, time, different, teaching, teach, experience, ask, difficult* and *hard*.

This was used as a basis for the next stage of analysis, as keywords alone can be taken out of context if not considered appropriately within the sentence or response. An example of taking single words out of context can be seen with the words *think* and *know*. Initially I thought it could be worth investigating the differences between what respondents said they knew and what they thought – i.e. a fact versus a feeling. When reviewing in context, *know* was seen as such a commonly occurring word because respondents used it in a colloquial manner as well as formally.

Attempting to analyse responses to individual questions was not a suitably accurate method of identifying themes. This is because, due to the semi-structured nature of the interviews, some respondents mentioned similar issues or challenges but when responding to different questions. The thematic analysis chose to ignore the questions to some extent, but instead considered the transcript as a whole. For instance, if a respondent raised the issue of time, sometimes this was considered as a restriction, and sometimes it was mentioned in a positive manner; all issues of time were considered together.

Table 39

Identification of themes and subthemes		Linkage to Research Question
Theme A	blurring of role boundaries	RQ2
Theme B	difference in expectations	RQ1
Theme C	relationship between student and mentor	RQ2
Subtheme D	teaching	RQ1 & RQ2
Subtheme E	assessment	RQ2
Subtheme F	differences	RQ1 & RQ2
Subtheme G	challenges	RQ1 & RQ2
Subtheme H	empathy	RQ2
Subtheme I	time	RQ1 & RQ2

Six subthemes were identified initially, shown in Table 39, these were: teaching, assessment, differences, challenges, empathy and time. Also shown in the above table is the linkage to the overall research questions. This analysis was based on using the previous keywords as a prompt but considering them in context. On reflection, after further immersion in the data, these themes did not appear to give an accurate representation of the data as a whole and were seen as subthemes of an overarching narrow theme classification. These themes will be discussed in Section 6.15.

In order to demonstrate where these themes are found in each student interview and mentor questionnaire, these have been presented in Tables 40 and 41

Table 40

Identification of themes within the interviews									
Respondent	Theme A	Theme B	Theme C	Subtheme D	Subtheme E	Subtheme F	Subtheme G	Subtheme H	Subtheme I
SM10		✓	✓	✓	✓	✓	✓		✓
SM11		✓					✓	✓	
SM12	✓		✓	✓			✓		✓
SM13	✓		✓	✓	✓	✓	✓	✓	✓
SM14	✓	✓	✓	✓	✓	✓	✓		✓
SM15		✓	✓	✓		✓	✓		✓
SM16				✓					✓
SM17		✓	✓	✓			✓	✓	✓
SM18			✓	✓		✓	✓		✓
SM19	✓	✓	✓	✓	✓	✓	✓	✓	✓
SM20		✓	✓	✓	✓	✓	✓		✓

From Table 40, it can be seen that all respondents mentioned at least two of the themes within their interview. SM16 only linked with two themes: teaching and time. SM13 and SM19 mentioned eight and nine of the themes. SM16, SM13 and SM19 were all scored with the joint second most positive attitudes towards mentoring. Therefore, there does not appear to be any link with positive attitude and the number of themes identified within their interviews.

Table 41

Identification of themes within the questionnaires									
Respondent	Theme A	Theme B	Theme C	Subtheme D	Subtheme E	Subtheme F	Subtheme G	Subtheme H	Subtheme I
MM11	✓	✓	✓	✓	✓	✓	✓	✓	
MM15	✓	✓	✓			✓	✓		✓
MM16	✓	✓	✓	✓	✓	✓			
MM18	✓	✓	✓	✓		✓			✓
MM19		✓	✓	✓		✓	✓		✓

Comparing Tables 40 and 41, there were some similarities and differences when considering specific student and corresponding mentor pairings; however, no trend emerged.

The use of Wordle™ in addition to a more traditional thematic analysis was outlined in Section 5.4.5. The combined interview transcript from all student interviews were combined and entered in a Wordle™ the outcome is demonstrated in Figure 6.1.
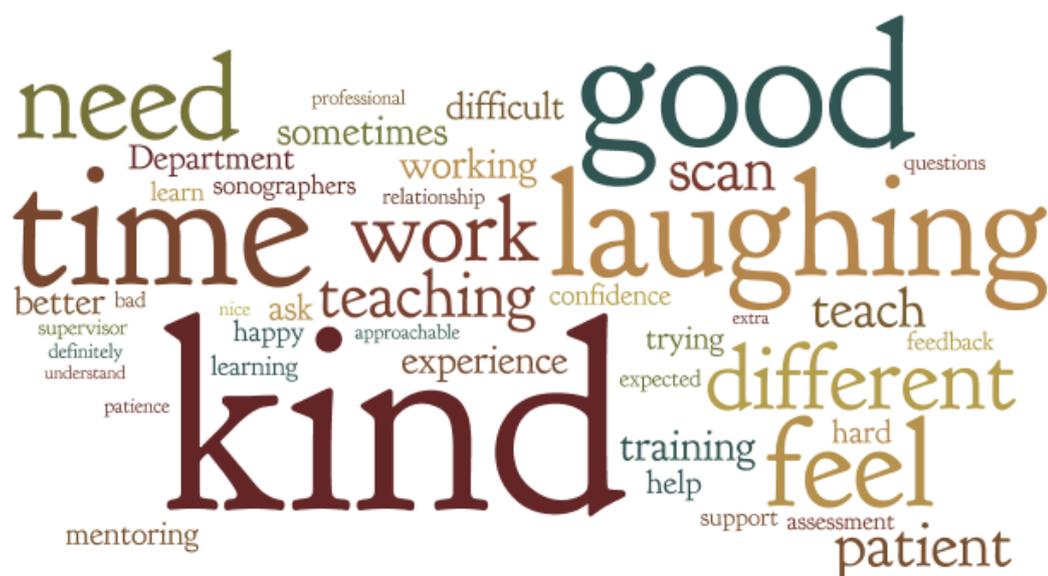
Figure 6.1 – Wordle™ from interview transcripts

The contents of Figure 6.1 can be related to all six of the subthemes identified. *Teach* and *teaching* can be seen within Figure 6.1, as they stand out in moderate prominence. *Assessment* is present but not seen particularly prominently. *Different* is seen standing out more than teaching or teaching. The theme of *challenges* is not directly seen nor directly shown; however, words such as *trying*, *ask*, *questions* and *hard* could relate to challenges. The word *empathy* is not seen but *feel* and *patient* are visible, which can relate to empathy. Also, if being *kind* and *good* is the same as empathy then it can be considered to be present within Figure 6.1. The final subtheme of *time* can be seen prominently in Figure 6.1. The use of the Wordle™ can support the subthemes identified within the full thematic analysis.

If the Wordle™ alone had been used for analysis with the most prominent words taken as themes, then the themes would have been: need, good, time, laughing, kind, work, different, feel and teaching. These words alone are too vague to be themes but show that a Wordle™ could be used alongside full thematic analysis. It could also be used to double-check analysis as a means of ruling out bias, as the Wordle™ may be less prone to bias in interpretation compared to a thematic analysis.

6.5 Mentor questionnaire findings

The findings from the questionnaire are presented in tabular form on a question-by-question below with brief commentary. Responses are presented in full as provided. The corresponding

discussion will be combined within the presentation of student interview findings, with discussion of themes identified within the interviews.

Table 42

Question 1	
Please detail how you were selected to be a mentor. (RQ1)	
Code	Response
MM11	In my role I am in charge of education within the department
MM15	As supervisor for a current university student my manager requested that I be the mentor
MM16	I volunteered
MM18	I was one of the most qualified sonographers in the department to perform and teach the scanning areas the students wanted to specialise in.
MM19	I always supervise ultrasound students from the university

Table 43

Question 2	
Please explain how you felt when you were identified as a mentor (RQ1)	
Code	Response
MM11	Identified well with filling in work for the course, teaching session and part of the end of course assessment.
MM15	Grateful, appreciated, excited
MM16	Happy with involvement in student training
MM18	Great responsibility
MM19	Pleased at first a chance for myself to learn, to look up questions asked and keep me up to date with the opportunity to help others to learn as well. I enjoy engaging with people. Having done mentoring for years now and have more management responsibility my time is more limited and I am looking to hand over.

The answers provided to questions 1 & 2 were somewhat brief and on reflection did not contribute to facilitate answering either research question, nor did the responses link to the themes identified previously in Table 39.

The responses to question 2 from MM15, MM16 and MM18 could be asserted to support the work of Baranik et al. (2010) who linked mentoring with positive feelings towards ones job and job satisfaction.

Table 44

Question 3	
What involvement did you have in selection of the student for training? (RQ1)	
Code	Response
MM11	Part of interview panel to assess readiness based on time in ultrasound and overall radiology experience
MM15	None
MM16	Participated in interviews and selection process. Assessed suitability of candidates - they spent a day in ultrasound department prior to interview
MM18	No involvement at all I was just told that I would have to provide the training
MM19	A lot, though often is it down to who can fund themselves now

The responses to questions 1 & 3 do not align with the majority of findings present in the literature review. Straus et al. (2009), Cook et al. (2010) and Nick et al. (2012) advocate the importance of the relationship between the mentor and mentee. It was also suggested that the mentor should have involvement in selecting their mentor. The results of question 1 demonstrated that three mentors always take on the mentor role in their departments regardless of the student, thus not giving true consideration to the matching and importance of the relationship between the mentor and student. In response to question 3, three mentors are involved within the recruitment or selection of the student, by the mentor having participation in the selection process gives more consideration to the matching process that those who have no involvement which partly supports the work of Morton-Cooper and Palmer (1999) who advocate both mentor and student being involved in the matching process.

Table 45

Question 4:		
Please identify by placing a cross on the scale below, your satisfaction with your level of involvement in the student selection (RQ1)		
Code	Response	
MM11	Very satisfied	
MM15	Neutral	
MM16	Very Satisfied	
MM18	Neutral	
MM19	Somewhat satisfied	

In question 2 it can be seen that MM15 and MM18 made positive comments regarding being a mentor and awareness of the responsibilities such a role might bring. However in questions 3 & 4 it can be seen that both MM15 and MM18 had no input into student selection and reported neutral feelings about their lack of involvement in the selection process. This also aligns with the findings of Nick et al. (2012) who stated that the matching of mentors and mentees is seen as crucial in maintaining the relationship.

In answering research question 1, these first 4 questions have provided insight into the selection of student sonographer and the role of the mentor within this.

The responses to question 5 -9 directly link to research question 2 and can be found within Appendix G. These five questions considered characteristics of the mentor, sonographer and person conducting the summative assessment. The students were asked the same questions in their interviews; hence it was decided appropriate to consider responses together, as found in Section 7.4.1

Table 46

Question 10:
Are the boundaries clear between mentors, sonographer and assessors roles clear? (RQ2)

Code	Response
MM11	In cases where the sonographer has been a fundamental part of the ultrasound team for quite a while, boundaries are difficult first as professional manner by the mentor and assessor must be maintained for a clinical assessment. Each individual would be made aware of the examination procedure and therefore this would make assessment easier and boundaries maintained.
MM15	The boundaries are unclear (somewhat) between sonographer and mentor. Only difference being signing the clinical portfolio.
MM16	Often the roles merge with mentor taking on role of sonographer and assessor. This is not detrimental.
MM18	Don't think so. In my department training is provided by sonographers who usually never had any specialisation in mentorship
MM19	Yes

The responses to question 10 link with the conceptual framework (Figure 2.3) found in section 2.19. Four respondents detail unclear boundaries in the roles of the mentor, as seen in the conceptual framework, it was considered that the role of the mentor incorporates elements of supervision, training and support, all. MM19 responded 'yes' with no additional details given, this highlights a potential limitations of a questionnaire compared to an interview situation where prompting or elaboration could take place. Contributing the answering to research question 1 and in agreement with the work of Kirkpatrick (2015), it is important that mentor support and guidelines make mention of the diverse nature of the role and the overlap with other roles.

Table 47

Question 11:	
Please describe how you feel when you encounter factors which impact on your mentoring that are outside your control (RQ2)	

Code	Response
MM11	If I need to leave when a student is part way through the course, I feel guilty that I give that for and cannot be there for their final eventual progression form student to sonographer. Staffing issues also frustrate me as a mentor when I don't have the time to teach and discuss each case chosen by the sonographer in full.
MM15	I would have liked to have had the opportunity to attend the mentor training referred to in the handbook. If adequate time is not assigned to the student in relevant area of imaging that is frustrating.
MM16	No issues with mentoring role
MM18	Very frustrated. Training programmes are usually well structures and planned by the university but sometime local departments do no offer the necessary support to students or mentors
MM19	Sad, annoyed frustrated. Though a need to take control and sort. Isolation sometimes as I am left to pick up the pieces on my own. Can feel blamed

When responding to question 11, four mentors detail feelings when they encounter issues with students which are outside their control. Linking with research question 1 and the work of Eby et al. (2010), mentor training and support needs to include information and techniques regarding this area to support mentors and equip them with the skills to support their student.

Question 12 asked about the changing nature of the relationship between the mentor and the student throughout the period of the ultrasound course. Also contributing to the answer to research question 2, these responses correspond with literature presented in Chapter 2. During the duration of the mentor / student relationship, increased time is spent together,

leading to a greater depth of relationship, as can be seen in the response to question 12, Tourman et al. (2012) detailed time together as in important factor in not only building but maintaining the mentor / student relationship. Hobman et al. (2009) assert the role of the mentor in contributing to the psychological wellbeing of the student; responses relating to this are seen in question 12. The transition in relationship detailed in question 12 is evidence of the mutual respect between the mentor and the student, proposed as crucial by Weinberg and Lankau (2011).

Table 48

Question 12: Please can you describe what you consider to be the ideal relationships between mentor and student (RQ2)	
	At the start of the course
MM11	Colleagues working together and the mentor leading by example
MM15	Trust is established and gained during the process
MM16	Supportive and encouraging
MM18	Mentor should make it clear to students there is a long way to the final destination
MM19	Friendly though with some distance
	During the course
MM11	Colleagues working together and discussions arising more frequently
MM15	That the student may question any aspect of course/guidelines.
MM16	Supportive and encouraging
MM18	Mentor should provide feedback frequently and discuss learning points

MM19   Trust, approachable both ways

At the end of the course

MM11   Colleagues working together in the knowledge that the student   is ready to
            move on in the profession

MM15   Mutual respect. Encouraging and confidence building

MM16   Supportive   and encouraging

MM18   Almost as a colleague. Show confidence in students skills

MM19   Trust, confidence

Table 49

Question 13: **Please give an example of the good mentoring you have demonstrated and describe how it made you feel (RQ1)**	

MM11   Mentoring when a student while dealing with a difficult patient and the patient being quite aggressive. I showed the student to be patient and tolerant and explained with good communication skills what is required frequently in ultrasound, it made me feel like I was showing my confidence and that was a good teacher and mentor.

MM15   The student was quite anxious during all examinations, attempted to instruct on and practice mindfulness and breath control. The aim being to calm the student. Remind themselves "I can do this" and build self-esteem. Also remind the student around correct diagnosis she has made.

MM16   To me the sign of a good mentor is when my student has frank and open dialogue with me about their progress and any issues that have arisen. A well trained and motivated competent sonographer is my ultimate aim

MM18   Discussion after each scan about pathology and scanning technique

MM19   The student read on the patient face they were worried about something. The student asked the patient if they were ok. The patient wasn't and they explained why. I acknowledge this to the student and explained this was good practice, well done, this in turn encouraged the student in all areas.

Questions 13 & 14' responses linking with research question 1 demonstrate examples of good practice characteristic or mentor techniques that the mentors demonstrate, along with challenges they face. Discussion and support related to this can also be developed during mentor training as details in Section 7.4.1

Table 50

Question 14:
Please explain how you would feel if your student ignored you, did not respond positively or is unmotivated (RQ2)

MM11   If a student ignored me I would see it that the student had the problem whatever was going on I would continue the student positively, I've never had this occur.

MM15   It would feel like time wasting and or insufficient utilisation of resources. Frustrating. Like she did not want to pass the clinical assessment. My reputation is partly 'on the line' also

MM16   Disappointed

MM18   I understand ultrasound training is a long process and there is always room for incorrect answers or lack of motivation

MM19   I am giving time to teach. It is hard work as well as managing a list I find it a real lack of appreciation if the student does not listen, we are only trying to help them. Life with a student isn't easy for us. I think mentors and sonographers are sometimes not appreciated until the student qualifies and has a student to teach. They can be quite selfish while training but perhaps you have to be as it is a hard course.

Table 51

Please use this space to add any further comments you have about the mentoring, supervision and teaching of ultrasound students in clinical practice. (Both RQ)	
MM11	None
MM15	As mentoring is essential in producing experienced sonographers, adequate allocation of time is required for the student to become exposed to all the possibilities of diagnosis, management and treatments available, in the mentor handbook role play scenarios could be given as examples to mentors around questioning of students.
MM16	None
MM18	None
MM19	I think often the students do not realise how hard it is to teach/mentor, we often are only doing our best. Though it is a really hard stressful course so patience is needed all round

The mentor questionnaire concluded by providing the mentor with the opportunity to make any further comments regarding mentoring. Three mentors did not have comment, the other two made comment related to support, time and patience. These link with the themes identified in table 39.

The findings of the mentor questionnaires are summarised below for ease of reference:

- There is often one mentor for a department who takes on the role for every student.
- All mentors reported positive feelings regarding being selected as the mentor.
- There were mixed responses regarding the involvement of student selection. Three mentors reported being involved; two reported no involvement.
- Satisfaction with involvement in student selection responses correspond with replies to previous questions. The three mentors who reported being involved with student selection were somewhat, or very, satisfied with their involvement. The two mentors with no involvement reported neutral feelings towards this involvement.

- The characteristics of the mentors and the rankings are discussed in Chapter 7.

- Four respondents reported unclear boundaries between the mentor, assessor and sonographer roles.

- Three respondents identified frustration that they encountered when issues ran outside their control.

- MM16 considered the relationship with their student did not change over time. All other respondents reported growth and development of the relationship over time.

- All mentors identified good practice areas in their mentoring. These included: communication, tolerance, confidence, building self-esteem, motivation, discussions, listening and encouraging. Mentors did not explain how this made them feel.

- When a student ignored their feedback, all mentors felt disappointed but most suggested tactics to deal with such situations

Throughout this section the mentor responses have been linked to corresponding matters within the literature review. The findings of the mentor interviewed highlighted the need to support and guidance, this supports the need for research question one and provides some contribution to answering it. These questionnaire findings also provide insight into answering research question 2 – all developed in Section 7.4

6.6 Student Interview findings in relation to identified themes

Rather than present interview findings on a specific question basis, they will be presented in relation to the themes identified in Table 39. Links will also be made to the literature presented in Chapter 2 where appropriate. Quotes from respondents are presented in bold typeface exactly as were articulated without any alteration.

6.6.1 Teaching and the mentor role

When students were asked to give an example of good practice they had experienced from their mentor, SM12, SM13, SM14 and SM19 gave the example of being taught. SM12 responding **'obviously she's taught me as we've gone along'** the inclusion of the word obvious by SM12 indicated that they understand teaching a fundamental expectation of their mentor. SM13 gives further insight into their expectation of teaching by saying **'you're there to be taught how to do something right, and if people sort of say, "Oh yeah, that's alright, that'll do," you know, that's no good. I want…what's the right way to do it – I want to know the right way to do it first and to then improve on that, and if I'm not doing something right, I want to know that I'm not, rather than just people worrying about upsetting you'** Not only

does SM13 expect to be taught, they expect to be taught well with honesty and good feedback. SM14 responding with even more detail about expectations of being taught **'if they choose to work in a teaching hospital – you would expect to have mentoring even when you're not with your student. You should supervise them, you should challenge them, you should be patient, you should teach them… We do it with our students, undergrads, so they should do it I think [with me] – everyone should do it.'** This could also link with the theme of a difference in expectations, SM14 expects to be taught, not just be their mentor but by all sonographers. They view teaching as an integral element of being a radiographer or sonographer and do not leave the emphasis with teaching on the mentor, also linking with blurring if boundaries between mentor and sonographers. SM19's response regarding teaching **'I meant mentor…for me, a mentor was someone who…not supervisor, who's not the assessor, but who is someone, to be with me, teaching me'** also links with the theme of *blurring of boundaries* between roles and section 2.17 of the literature review where the different role names was discussed, however SM19 appear clear of the different expectations of their mentor, supervisor and assessor. In their opinion, SM19 identifies the key role of the mentor as **'Ability to teach'** which further justifying teaching as an overall theme of my research.

From these responses linkage can be made with both research questions 1 & 2. For research question 1, guidance and support can be provided to mentors about teaching strategies. If a student expects a mentor to teach and they do so, this can aide the positive nature of their relationship, linking to research question 2. Kirkpatrick (2015) the role of a mentor (or preceptor) is to work with someone over a set period of time to guide and *teach* a certain skill, in this case teaching ultrasound. Where tacit knowledge was introduced in section 2.9. Williams (2010) explain how they perceive that the best teaching takes place on the job, ie by the mentor or sonographer within the clinical department, rather than within the university environment. The responses to this question also support the inclusion of the teaching element within the conceptual framework shown in figure 2.3.

Other students gave examples of being asked questions regarding what they were doing as good practice. Being encouraged to discuss the findings of the scan was identified by three students as an example of good practice; SM14 articulated that **'They have to keep**

interaction, and they have to ask questions'. SM18 identified good practice as **'asking you questions as you're scanning'** similarly SM16 said **'asking me lots of questions'**. Asking questions of the student and discussing the findings is something that lecturers at this University would expect all sonographers to do on a regular basis. This response from students indicated a *difference in expectations.* I would expect that this practice of teaching and questioning should be routine, rather than a rarer example of good practice. Detail regarding the day-to-day expectations of sonographers and mentors was subsequently emphasised within mentor training linking with research question 1. Expectations were also communicated to students during their induction.

There were three respondents whose example of good practice was when their mentor saved interesting cases they encountered and later discussed them with the student to aid their learning. SM13 explained **'emailing interesting cases to me, so that I could then review them, and then we'd talk about them later on'** SM15 gave a similar example of good practice they had noted, **'An interesting case that I wasn't working with them that day and they said that, it was a rare case, and they recorded the number and they came to me and they talked me through the case, and I found that was very good on their behalf, yeah. I thought that they were…you know, that they were thoughtful in…in thinking about me and trying to further my development.'** This is something I would endorse as an example of good practice and is also emphasised during mentor training along with linking with the themes of having empathy to be discussed in Section 6.6.5.

In order to include an element of phenomenology to the study, students were asked how these positive examples made them feel. SM18 reported feeling **'happy'** whereas SM13 and SM15 gave more detail: **'Brilliant. It made me feel, you know, like I mattered, I was a part of the team as such, and it all sort of built up, yeah, a better experience, you know, overall, and people that were really, keen for me to progress'** (SM13) and '**I was…I suppose I was thrilled that they just didn't see it as a tick in the box situation, that they're my mentor, that they actually were showing an interest in my development'** (SM15). I would want that no one ever felt that they did not matter, or that their training was a tick-box exercise; yet given the words used, it is obvious that some do feel that way. This is a valuable issue to be aware of that can be included in mentor training, with the intention of increasing teaching and ensuring such negative feelings do not occur again.

In order to gain a balanced perspective, students were asked to provide any examples of poor practice that they deemed their mentor demonstrated. It was satisfying to find that six respondents could not identify anything that their mentor had done which they thought of as poor practice. Two of these respondents, however, did continue to provide examples of poor practice they had encountered from other staff, not their mentor, as evidence of *blurring of role boundaries* between the different roles. Respondent SM17 gave the example of poor mentoring **'I really struggled at first because I didn't feel like anyone took any kind of responsibility for me'.** SM13 felt frustrated by poor mentoring when they were left alone explaining '**"frustrated" is probably the key word because, especially early on, I was thinking, well, I've got the basics of the scanning technique – that doesn't mean I'm completely au fait with everything that I'm seeing here, you just feel as if you're not making any progress because you're still unsure about what happens'** SM16 felt that their mentor undermining them in front of patients was an example of poor mentoring; the effect of this has lowered SM16's confidence. SM15 explained feeling '**I kind of felt stupid. I was like…but this is how I always do it…you know, and then I was like, slightly embarrassed'** they felt although criticism was due, they felt it could have been used for feedback at a different time rather than in front of the patient. Students reporting being regularly left alone which is a concern for patient safety. Ultrasound is a dynamic examination with a limited number of representative images being taken; review of these images alone does not allow diagnosis, so if the mentor is not watching the examination but merely viewing the images, the potential to miss pathology is high. A student might not realise they have missed something if it is not pointed out to them at the time[1]. While presented under the subtheme of *teaching,* this aspect of mentoring could also come under *challenges,* showing the complexity of the analysis and identification of subthemes. This feeds into the main theme of *difference in expectations*. The expectation of a mentor to think supports the work of Morton-Cooper and Palmer (1999), who list teaching as part of the mentoring role. The definitions of mentoring provided in Chapter 1 did not all include a teaching element. Given that the data from both the student interviews and the mentor questionnaires highlighted that the mentor is also expected to teach, supervise and perform many other roles and tasks not traditionally associated with a mentor role, it was

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[1] *Where any student raised concerns of being left alone and not being supervised correctly which may have affected patient safety - this was raised as a concern with the mentor. This was a benefit of interviewing and not collecting data anonymously. I was assured that no harm came to any patient as a result of student training*

deemed prudent to expand the literature review to investigate these areas further – hence its inclusion in Chapter 2.

6.6.2 Assessment by mentors

Kay and Hinds (2005) state that mentors should not be involved in the summative assessment of their students, whereas Kilgallon and Thompson (2012) suggest that involving the mentor in summative assessments is good practice, as discussed in Chapter 2. Custom and practice on the ultrasound programme aligns with Kilgallon and Thompson (2012) in that the mentor is the one who performs their summative clinical assessment (alongside a representative from this University). Due to this difference, it was felt important to ask students about their feelings regarding having their mentor undertake their summative assessment. 100% of the students responded that they were happy with this practice of being assessed by their mentor. SM11, SM13 and SM17 thought their mentor's calmness would be beneficial to them, specifically saying: **'keep the situation calm and kind of, you know, encourage me as best as she can, and at the same time, be able to stand back because this is the day where I have to prove that I'm able to scan'** (SM11), '**I'd feel quite comfortable with it, rather than somebody else coming to do it. I think it would be good, I think, because you build up a relationship as well, and you'd possibly like lose some of the nerves that you might have'** (SM12), '**I think she's very fair. I respect her'** (SM15) and SM20 attributed their contentment to the *relationship* built up between them and their mentor. However, SM15 and SM20 also expressed some reticence regarding the expectation to pass. SM15 explained '**My only fear is that the reasons why I do pass or why I do fail, that she has taught me them you know, if that make sense, that I hope that there isn't an expectation that she has, that she thought I would live up to, but if haven't been taught it, how do I live up to it?'** The responsibility of mentoring according to Stagg (2009) lies with the mentor as SM15 would appear to support given their response here. However the findings of Veronneau et al. (2012) state that the student should be the one to take responsibility for their own learning, and thus should not be in the situation postulated by SM15 in not being taught something. This is also links with the previous section (6.6.1) regarding an expectation of the mentor to teach.

SM20 expressed concerns or empathy for her mentors within the assessment situation rather than her own saying '**I think it's very hard for them because they spend all this time telling you what to do or advising you how to perform, and then, for that final assessment, they've got to be very quiet and not give you any more instruction so I think that's going to be hard.**

I trust that she'll make the correct judgements. I actually think it must be harder for them…not "harder", but as hard, in different reasons, because, you know, at the end of the day, you build up a professional relationship, a student/mentor relationship with this person, and, they don't want you to fail, and if, at any point during that assessment, I clearly don't perform in the way that I'm expected and she has to fail me, I think that's going to be really hard.' If as Kay and Hinds (2005) suggest the mentor is separate from the assessment situation then these potential issues would not arise. The literature include in Chapter 2 consider mentor involvement form a student perspective, unlike SM20, no consideration was given for the effect on the mentor involvement in the summative assessment may have. These comments I believe demonstrates a high level of empathy within SM20 and give testament to the good working relationship between her and her mentor which has developed over the duration of the course.

SM19 was the only respondent who did not provide a solely positive response – whilst they were happy for their mentor to assess them; they responded that **'It doesn't matter actually, you know, there are there to support you in the background'** they went on to discuss the *blurring of the boundaries* between all the roles of mentor, manager and assessor.

Of the three students who had reported poor mentoring experiences during the year, all were granted extensions to their summative clinical assessment, as they were not deemed at the required standard within the usual assessment time period. None of the remaining eight students had extension to clinical time and all passed at first attempt. It is outside the remit of this study to ascertain a correlation between perceived poor mentoring and extension to, or performance in, assessment but it will be taken forward in future work.

6.6.3 Differences between expectations and mentor practices

During seven of the interviews it became evident that students discussed their personal mentoring experiences with other students in the cohort and recognised that there were obvious differences in the quality of the mentoring they had experienced. When drawing comparison with other students, SM12 indicated that they **'I kind of haven't really been encouraged'.** The department where SM14 worked had never trained a sonographer before leading to SM14 to report **'I was the guinea-pig of the department. None of the sonographers in my department were trained in the UK, so they have a different system, and they don't know the regulations, the guidelines, and what we need to know. So I was doing all that by myself. And then, supervision-wise as well, I wasn't supervised that much.**

I've had zero mentoring compared to……' Both of these students had made lecturers aware of their situation, which led to implementation of additional support and closer liaison with the department in an effort to ensure the student's mentoring experience was positive. This situation also highlighted the need for a mentor to attend training and access support provided, linking with research question 1.

Although not mentioned when asked about poor mentor experiences, SM19 stated: '**I don't know that I have any mentor'** however when prompted SM19 proceeding to explain that there was a supervisor and an assessor. A mentor had been requested, following the recommendation of Wang (2010) regarding having a formal mentor. This links to the main theme of *difference in expectations,* as well as the theme of *blurring of role boundaries*. Student SM19 had a clear difference in their mind in respect of the expectations of a mentor, supervisor and assessor.

It is to be expected that students will notice differences within their mentoring, given that different students have different levels of needs, leading to different support requirements. A skill of the mentor is being able to adjust the level and extent of mentoring as required (Morton-Cooper & Palmer, 1999). This corresponds to Creanor (2007) who claims that there is often a discrepancy between student expectations and actual provision of support.

6.6.4 Challenges

The first challenge arising was the training programme for mentors. All mentors are invited to attend two training sessions to support them in their role. The first session takes place a few weeks after their student commences ultrasound training and the second training session is midway through the course. Both of these sessions take place at this University and also provide the opportunity for mentors to meet and share concerns or good practices with other mentors. The mentors of the three students reporting particularly poor mentoring have not attended the mentor training sessions offered since records commenced (12 years ago). The attendance at training of the mentors for the remaining eight students, who reported a positive mentoring experience, was mixed. As a consequence, attending mentor training and subsequent student achievement did not show a positive correlation, so no conclusion could be drawn regarding how far the attendance at mentor training impacted subsequent student results.

The five students whose mentors did not attend the training were asked how this non-attendance made them feel. SM18 responded to this positively by saying they understood and that they might not be able to attend '**I don't feel that bad because obviously he was on holiday**'. Whereas the non-attendance of their mentor at the training provoked negative responses from some, making SM11 feel '**I suppose I was a bit concerned maybe because I hadn't really started the course fully at that stage, so it was kind of worrying like would it be a disadvantage to me.**' SM13 reported '**It leaves you feeling confused and not...not really knowing… so it's not very good.**' When SM15 realised their mentor had not attending training the felt that '**that they're not probably giving me the 100%**'. The expectation of the mentor to attend the mentor training provided as viewed by the student, could lead to a *difference in expectations*, which could benefit from leading to a discussion between the mentor and the student.

SM12 had a stronger reaction, using phrases including '**she just couldn't be bothered, like she couldn't be bothered to fill in my feedback forms, you know, couldn't be bothered to set up a meeting**' and '**everything was just always too much of a hassle for her**'. Finally, SM12 said: '**I kind of felt like I was…really that I was just in the way most of the time and, yeah, more of a hindrance being there.**' This perceived lack of interest could be a factor affecting the relationship between SM12 and her mentor, a consideration when answering research question 2.

These five students mention above felt their mentor not attending was a challenge to their own training and could also make a *difference in expectations*. The student and the University both see a definite benefit in mentors attending training. Some mentors do not see the same benefit or do not prioritise the time to attend, linking with the other subtheme of *time*. Eby et al. (2010), who advocate providing training for mentors, do not present strategies for increasing attendance. These challenges with attendance at mentor training also arose within the pilot study; in Chapter 5, respondent SP1 suggested '**make attending training compulsory**'. Whilst this might be desirable, it is not possible within the ultrasound programme. However, alterations were made to the timing of invitations to the mentor training days, with a view to overcoming the challenge of lack of attendance and the feeling this evoked within the students.

Providing examples of good mentoring presented a challenge to three respondents, who appeared uncomfortable to admit they could not identify an example of good mentoring. Interestingly, these were not the same three respondents who previously detailed a poor experience of mentoring. This showed that even those with an overall poor experience of mentoring were able to recognise aspects of good practice when asked. Those who were unable to provide good examples of mentoring quickly added a proviso. SM20 reasoned that '**they were lacking in experience, though'** and SM12 said '**they are very good at their job, though'**. SM10's justification for lack of good mentoring experience also links with the theme of *time*, in that the rationale for not providing a good example was: '**It was too rushed ... we didn't have time**.' Those who could not identify an example of good mentoring yet still reported an overall good experience could have high standards and a *difference in expectations* of what good means, compared to those who did respond with examples. Alternatively, they could have rated the overall experience as good because nothing negative happened and they wanted to be optimistic.

When asked how students felt when they experienced poor mentoring, the responses included (depicted alphabetically and duplicated where more than one respondent mentioned):

Confused

Cried

Demotivated

Disappointed

Disinterested

Down

Embarrassed

Frustrated

Gutted

Not nice

Panic

Stupid

Unconfident

Unconfident

Undermined

Undermined

Very disappointed

This list is somewhat substantial when compared to the four responses gained regarding positive feelings about good mentoring detailed previously, again proving the need for the main theme of *difference in expectations*.

6.6.5 Empathy

The subject of empathy first arose within Chapter 2 where Kilminster & Jolly (2000) identify it as one of the skills and qualities of effective clinical supervisors. Within the pilot study, when asked about what should be include in mentor training SP3 (table 29) mentioned empathy within the response. According to the Oxford English Dictionary (2017), the definition of empathy, is "the ability to understand and share the feelings of another". Within both the mentor questionnaire and student interviews, respondents were asked to consider issues from their own perspective before being asked to consider if there opposite (mentor or student) would provide the same response. The similarities and differences between these responses are considered in Section 6.8, where similarities were noted in responses between mentor and student, they were deemed to have high levels of empathy. This also links with the attitude rating results presented in section 6.7.

An emerging theme from eight of the students reporting a good mentoring experience is that of getting support or empathy from their mentors, managers and colleagues. However, when asked about the ideal characteristic of a mentor, no student mentioned being supportive. This could be because they do not see it as a characteristic or took it for granted that all mentors would be supportive. Empathy was highlighted as a desirable characteristic by four respondents, SM11, SM13, SM17 and SM19. This finding does not correspond with the findings of the pilot study presented in Chapter 5, where all students said a *supportive* mentor was essential and did not overtly mention empathy. These findings do however align with the work of Kilminster & Jolly (2000) who consider it an important trait of a mentor.

Whilst empathy might not have been used directly, patience and consideration of feelings can also be considered elements essential to empathy. SM10 felt that their mentor's patience **'I just found patience just went out of the window towards the end of the course',** this shows

a lack of empathy and emphasises the breakdown of the *relationship* between SM10 and their mentor over the year. When SM10 was asked to consider if they thought they had the desired attributes to make a good mentor in the future, patience was mentioned first of all, indicating the importance SM10 placed on patience.

SM13 and SM14 identified patience as a characteristic of an ideal mentor. SM13 and SM19 mentioned empathy. When asked a similar question in relation to the expectations of a supervising sonographer, SM13 was the only respondent to mention patience. This stresses the *difference in expectations,* according to SM13, between the mentor and the sonographer.

When discussing the ideal characteristic of a sonographer, SM16 mentioned patience repeatedly but made no mention of it as a desired characteristic of either a mentor or assessor, leading to the conclusion that SM16 is clear about the *boundaries* between the roles and has *different expectations* of each.

When detailing characteristics of any role, SM17 did not mention any words related to empathy. When asked about potential personal weakness that may inhibit them being a mentor in future, patience was mentioned. This reaffirmed my initial decision to discuss the results as a whole via theme, rather than per question, to ensure similar points were captured together.

This section has made mention of patience by a number of respondent. Having patience may be considered closely linked with empathy, refereeing back to the eairl definition proved (the ability to understand and share the feelings of another) it sometimes takes patience to develop this ability to understand and share feelings, hence justifying the mention of patience within this section. Linking with research questions 1 & 2, empathy could be a factor which influence the relationship between mentor and student, and whilst including detail regarding it can be included in support and guidance mechanisms (research question 1) one cannot teach someone to have empathy. Where tacit knowledge was considered in Section 2.9, we can know more than we can tell (Polanyi 1966 cited in Kothari 2011 and Eraut 2000) empathy is similar in that one can appreciate that one should be empathic but no mentor training or guidelines can tell someone how to develop this attribute.

6.6.6 Time

When considering the theme of time, it was apparent that there was perhaps an overall expectation from students of mentors being available more often. This theme of time was

viewed from both negative and positive viewpoints equally. Throughout the interviews there were nine specific occasions where a lack of time was mentioned as a negative aspect. Respondents SM12, SM13, SM14 and SM19 stated that they did not get to spend as much time scanning with their mentor as they would have liked. '**She didn't set aside any time, to even fill out my forms –, I never got any feedback**' (SM12), '**I haven't worked with very often… probably doesn't spend enough time doing a certain area of the scanning'** (SM13), '**I felt bad for her because she doesn't have time to do anything anymore, she will help me with some stuff, if she has time obviously'** (SM14) and **'Lack of time is one thing. I was given some teaching sessions, but never really, you know, ideal teaching sessions. It's more borrowing the time from someone's time and then do it bit by bit, learning by looking and learning bit by bit. It's all time, time and priorities, isn't it? '** (SM19)

Rather than limits to actual scanning time with mentors, SM10, SM15, SM16, SM17, and SM20 detailed how their mentors did not have enough time to spend with them after the examinations, asking questions or discussing interesting cases. SM20 explained that their mentor only had time for them in the actual scan room during the examination; however, questions often arose at other occasions and SM20 would have liked additional time to discuss these items with their mentor along with extra scanning time '**It's hard because you need the time in the scan room to learn'**. This feeds into the overarching theme of a *difference in expectations* between the mentor and the student.

Conversely, there were some specific comments that gave a positive viewpoint on the time issue. SM10 explained how they had more training time since it was recognised they needed time for discussion and teaching. The *relationship* between SM18 and their mentor improved '**It's got better actually because we've spent more time together, so it's actually got a lot better'** this extra time spent together was described as a catalyst to this improved relationship as they can have '**a bit of banter about it'**. Two unexpected comments were made about the extra time and effort mentors (and other sonographers) put into training. SM13 recognised their mentor did not have to put in the extra time but acknowledged that it had '**Lots of people have been interested in my learning and put in extra time or had me along when they didn't have to, which has been very helpful'**. In a similar vein, SM17 was grateful that their mentor took time to teach and discuss interesting cases '**when somebody sits with you throughout the whole thing, so they're watching the whole thing, and she'll take time – like, I don't know, if we find something that I've not seen before, she'll have little images that she**

can…her saved images that she can go through different examples' these are also examples of a mentor or sonographer demonstrating good practices I teaching linking with the previous theme, and linking with research question 1, mentor guidelines can highlight the importance of all staff, not just the mentor taking time to explain scan findings.

This theme of time aligns with the findings of the pilot study, with Figure 6.1 showing time to be prominent in the response regarding the ideal relationship between the mentor and student. Giving time to mentoring a student was discussed in the literature review in Chapter 2, where Fugill (2005) and Laschober et al. (2012) highlight the importance of time in the mentor/student relationship.

6.7 Attitude rating findings

Table 52 shows the attitude rating score as completed by myself and the second reviewer. The students' responses were scored and then the scores were then ranked. The lower the score, the more positive the student's overall attitude was towards mentoring, and vice versa. The potential range of scores was from 14-70. The range of scores attained from my scoring was 21-50 and the range attained from the second reviewer was 31-47. The full attitude rating charts completed by from me and those from the second reviewer are in Appendix F.

Table 52

Attitude rating scores				
Student	Researcher score	Researcher rank Rank 1 = most positive	Reviewer score	Reviewer rank Rank 1 = most positive
SM10	49	9=	35	2=
SM11	21	1	31	1
SM12	50	11	47	11
SM13	30	4	35	2=
SM14	34	6	39	10
SM15	43	8	38	9
SM16	31	5	35	2=
SM17	29	2=	35	2=
SM18	29	2=	35	2=
SM19	49	9=	35	2=
SM20	35	7	36	8

It was necessary to quantify agreement between the two reviewers and the Cohen's kappa test was used for this. The Cohen's kappa test can be used on qualitative data, the student interview responses in this instance in order to measures inter-rater agreement of scores. The test was applied to each individual student and then to overall results. Appendix H provides the individual results for each student. Table 53 demonstrates the individual kappa scores.

Table 53

Individual kappa scores		
Student	Kappa	Strength of agreement
SM10	0.272	Fair
SM11	0.391	Fair
SM12	0.300	Fair
SM13	0.079	Poor
SM14	0.315	Fair
SM15	0.048	Poor
SM16	0.421	Moderate
SM17	0.248	Fair
SM18	0.097	Poor
SM19	0.176	Poor
SM20	0.319	Fair
Overall	0.267	Fair

Table 54 demonstrates the overall kappa scores, showing the agreement between the two reviews to be 'fair'.

Table 54

Kappa agreement scores						
Overall	A	B	C	D	E	Total
A	23	11	3	3	0	40
B	12	23	2	2	1	40
C	3	8	8	9	4	32
D	1	6	6	7	6	26
E	0	4	1	6	5	16
Total	39	52	50	27	16	154

Number of observed agreements: 66 (42.86% of the observations)

Number of agreements expected by chance: 34 (22.09% of the observations)

Kappa = 0.267

SE of kappa = 0.049

95% confidence interval from 0.170 to 0.364

The strength of agreement is considered to be 'fair'

By having a fair level of agreement between the two reviews, it facilitates limited discussion regarding attitude rating; if a good or excellent level of agreement been found, this may have led to further analysis. Both reviewers ranked SM11 as the student who showed the most positive overall opinions regarding their mentor in their interview. SM12 was found by both reviewers to demonstrate the most negative opinions regarding mentoring. SM12 completed the course in another hospital, as the relationship with the mentor became unmanageable. Rather than discard the attitude rating based on the fair level of agreement, the rankings alone were considered in conjunction with comparisons between interview and questionnaire data and will be discussed in the following section.

6.8 Overall discussion considering student interview and mentor questionnaire findings.

The discussion within this section will focus on the drawing of salient points from the comparisons and contrasts between the responses given by the students and the mentors when asked the same questions.

During the interviews and within the questionnaires, respondents were asked to provide examples they had encountered which they perceived to show good mentoring. When comparing responses between mentor and students only, SM18 and MM18 gave the same example. They both described the discussion of a patient and images to be good mentoring. As previously mentioned, from the lecturer's point of view that is an expectation of all mentors and sonographers, rather than a mark of particularly good practice, however in keeping with answering research question 1, This will be made more overt in future mentor training. The reason for mentioning this again is that both identified the same example, whereas none of the other mentors and students used matching examples. This supports the idea that there is a *difference in expectation* between most of the mentors and students regarding good practice. The mentors were not asked to give examples of their own bad practices, as this may have led to bias. On reflection, it may have been beneficial for mentors to reflect on whether they had demonstrated any poor mentoring, as learning from reflection can lead to improvement for mentors, which may in turn have benefitted the students.

The mentor of SM11 appears to be empathetic based on the following statement made during the interview: '**She wouldn't ever put you down or make you feel any worse than you do.***'* When considering MM11's responses to question 5 in the questionnaire, MM11 listed patience and being empathic as ideal characteristics of a mentor. However, empathy was not selected as one of the three most important characteristics by either the mentor or student. This led to the assumption that whilst being a key characteristic, there are others that are more important.

Respondent SM19 asked the question: '**So the supervisor does not have to be a mentor all the time?***'* This question highlighted that without careful analysis and rather considering words alone, points may be taken out of context. SM19 was not referring to *time* in the same way as the other respondents. The question, however, does link with two main themes: *blurring of role boundaries* and *difference in expectations.* It appeared from that statement that SM19 was not clear as to the role of their mentor and the role of the supervising

sonographer, and had *different expectations* about a mentor role and that of the supervising sonographer. However, SM19 seemed to contradict themself by also commenting that **'my mentor is in a difficult position playing all three roles'** – this leads one to assume that they have clear expectation of the mentor, sonographer and assessor roles and the understanding that one person can take on more than one role. When evaluating this response alongside their mentor's response to question 10 in the questionnaire regarding the clarity between roles, MM19 identified that they perceive clear boundaries between the roles. This drew attention to the fact that SM19 and MM19 have *different expectations* and a differing opinion on the *boundaries* of roles. The responses to this question also prompted reflection on the terms *mentor*, *teacher* and *supervisor,* which led to a further review of literature regarding the names and associated expectations, as presented in Chapter 2. Four out of the five mentors detailed that they felt the boundaries between the roles were unclear, hence its inclusion as an overall theme.

In support of the theme of relationship between student and mentor, both were asked about their relationship and how, or if, it changed over the year. All students except SM16 detailed a change in relationship with the mentor over the year. This aligned with the mentors' view: for example, MM16 detailed the same response for the relationship before, during, and after the course. All other mentor respondents detailed a change; their comments included **'becoming more like a colleague'**, from MM11 and MM18. Literature supporting the importance of the relationship between mentor and student includes Eby et al. (2010), Morton-Cooper and Palmer (1999), Nick et al. (2012), and Straus et al. (2009), as discussed in Chapter 2.

For those students whose mentors returned the questionnaires, comparisons and contrasts between their answers were considered. No comparisons between mentor and student responses could be made for the following student/mentor pairs, due to no response from the mentor: SM10, SM12, SM13, SM14, SM17 and SM20.

Table 55

Characteristics of a mentor – main study		
	Student responses	Mentor responses
SM11 and MM11	Approachable	*Communication*
	Confidential	*Patience*
	Not management	Lead by example
	Communication	Self-critical
	Patience	Empathy
	Have your back	*Knowledge*
	Leadership	
	Experienced	
	Knowledge of pathology	
	Empathy	
	Understanding	
	Leadership	
SM15 and MM15	Availability	*Experienced*
	Answer questions	Calm
	Time	Knowledge
	Confident in own abilities	*Approachable*
	Explain rationale	*Listening*
	Friendly	**Motivational**
	Flexibility	Enthusiasm
	Structure	Discussion

SM16 and MM16	Helpful	**Patience**
	Understanding	***Understanding***
	Listen	Calm
	Adaptable	Ordered
	Push us to develop	**Approachable**
	Teaching	***Interested in teaching***
		Communication
SM18 and MM18	Flexible	***Technical skills***
	Approachable	***Knowledge***
	Answer stupid questions	***Patience***
	Easy going	Perseverance
	Knowledgeable	
	Experience	
SM19 and MM19	Empathy	*Knowledgeable*
	Availability	**People skills**
		Patience
		Current / up-to-date
		Teaching
		Listening

Questions 2-6 from the interviews (found in Appendix E) and questions 5-9 from the questionnaire (found in Appendix G) asked about characteristics. Respondents were asked to list the characteristics they thought a mentor should possess. They were also asked which of those they considered the three most important. Table 55 contains the list of characteristics provided. Those in *italics* were those they thought the other would define as most important. Those in **bold** were identified as the most important.

Considering the responses from MM11 and SM11 from Table 55: SM11 thought knowledge was the most important characteristic for a mentor to have; MM11 recognised that students would consider knowledge an important characteristic found in a mentor. Both listed communication and patience, and MM11 thought that SM11 would think they were most important – and they did. This demonstrated that SM11 and MM11 are aware of what each other consider important characteristics and could correctly recognise opinions other than their own. They were the pair with most alignment between characteristics and therefore, unsurprisingly, SM11 was the student ranked with the best overall attitude towards mentoring in the attitude rating scales, seen in Table 52. The definition of empathy, according to the Oxford English Dictionary (2017), is "the ability to understand and share the feelings of another", so it could be said that pairings 11 showed a high level of empathy – and interestingly, both listed empathy as a desired characteristic of a mentor (Table 55). It can be seen in Table 55 that SM19 and MM19 had no commonalties between the characteristics listed. This shows they have limited perceptions of the other's perspective and have different understandings of the role of the mentor. SM19 was ranked the student who demonstrated the second to lowest attitude towards mentoring. SM15 and MM15 also did not list any of the same characteristics in Table 55 and displayed the 8th poorest attitude towards mentoring, in Table 52.

SM16 and MM16, along with SM18 and MM18, did list some similar characteristics to each other in Table 55; however, they could not recognise the importance from each other's perspectives. SM16 and SM18 were both ranked in the top third of positive attitudes in Table 52. It is acknowledged that this is based on a very small sample size, however it appears to lead to the following conclusions. Where the students and the mentors provided a more matched list of ideal characteristics, the student displays a more positive attitude towards mentoring. Conversely, where the students and the mentors provided no matches in their lists of ideal characteristics, the student displays a more negative attitude towards mentoring. This identified that there is importance to understanding each other's perspective and expectations in order to lead to a good experience, and therefore attitude, towards mentoring. Steps were taken to encourage this, and this is discussed in Chapter 7.

A difference in expectations between the mentors and the students was noted when considering the expectations of a mentor to teach, with 38% of students identifying this teaching trait compared to 80% of mentors. Whilst again acknowledging the small sample size

and low response rate from mentors, it appears that teaching is seen as a part of the mentoring role. As discussed in Chapter 2, Fugill (2005) provides a list of desirable characteristics found in the clinical teacher. These do not correspond with those mentioned by the mentors or students in this study.

6.9 Chapter summary

This study has met the three study aims as identified in Section 6.1 and has provided contributions to answers for both questions. The first aim was to investigate students' thoughts and opinions on the mentoring they received whilst studying ultrasound, and it provided the following insights:

- Students are unclear of the difference in expectation when working with their mentor and other sonographers.
- The boundaries between the two roles are blurred.
- There is an expectation that mentors teach, but the literature supporting this is varied.

Secondly, the aim was to gain an understanding of the mentor's perspective of their role, considering the strengths, constraints and relationships. This was achieved in relation to considering the students' perspectives on the strengths of their mentors. With the exception of a few detailed previously, most students identified the strengths and ideal characteristics that they would like to see in their mentors. The mentors were also able to reflect on their strengths. It is worth noting that if this study were to be replicated, I would advise including asking mentors a question about any examples of poor mentoring in their experience, to present a balanced perspective and facilitate reflection on their practice. There appeared to be a difference in expectations between the mentors' and the students' understanding, which was also different from the expectations of the lecturers.

Thirdly, this study set out to analyse the student and mentor responses in order to highlight similarities and differences between their experiences. It became apparent that there are different expectations between the student and their mentor. These differences can be seen in the overall attitude of the students towards mentoring. Those who understand each other's roles better and can consider alternative perspectives typically have a more positive attitude overall regarding their mentor than those who had little or no alignment between the student's and mentor's responses.

The following chapter will now draw conclusion together from across all three studies undertaken, it will link with literature along with providing detail of how each research question has been answered. Contributions to knowledge and practice will be provided before making recommendations for future work.

Chapter 7. Conclusions and Recommendations

7.1 Summary

The aim of this research was to investigate the factors that affect the mentoring of ultrasound students during the clinical element of their programme of study and to answer the two research questions formulated:

1. What guidelines and support mechanisms may be shown to be effective in helping colleagues and students in mentoring practice?
2. What factors may influence the relationship between the mentors and mentees?

The key concepts that arose were those of the intertwining of support, training and supervision encompassed within the mentoring role.

The literature review presented in Chapter 2 of this thesis showed a range of practices and opinions in relation to mentoring. Ultrasound practices in this University in 2012 were different from those found in the literature.

The aims of the exploratory study presented in Chapter 4 were threefold. Firstly I explored, through semi-structured interviews, the mentoring and supervision practices of other health programmes within the School of Health and Social Work at this University. Secondly, I was able to identify similarities and differences between aforementioned health programmes. These were aligned with the research questions and compared and contrasted with practices on the ultrasound programme. Responses were analysed in relation to whether mentoring practices followed or differed from the evidence base regarding mentoring and supervision, discussed within the literature presented in Chapter 2. Through conducting the exploratory study it was found that the term *mentor* had different meanings and expectations amongst the different professional groups. *Mentor* or *supervisor* training was provided on all programmes represented by the respondents, and a staged approach to mentor training was commonly encountered, as explained in Section 4.8. Thirdly, the exploratory study aimed to facilitate the opportunity to undertake a smaller scale study within my area of practice. I was then able to reflect critically upon this study (Section 4.7) in order to develop a strategy to progress to undertaking the pilot study.

Chapter 5 presented the pilot study, which aimed to test the procedures and data collection tools prior to the main study and to facilitate answering the overall research questions. There

were two secondary aims of the pilot study. Firstly, to investigate the features that might affect mentoring, from both the students' and the mentors' perspectives. Secondly, the pilot study aimed to identify how the matching of mentors and students took place and the understanding of both parties towards the matching process. These aims were achieved through interviewing students and sending questionnaires to their mentors. The findings of the pilot study identified that the students' and mentors' experiences were affected by a number of factors, and that mentor involvement in the selection process was key to developing and maintaining a positive and harmonious relationship between the student and the mentor. It was identified early on in the study that at this University a more formal mentoring process, giving consideration to the relationship between the mentor and the student, was needed. Findings from the pilot study also indicated that the past experience of the mentor does not necessarily affect how they perform the role with their students. From this pilot study, changes were made to the data collection processes informing the main study.

The main study further allowed the research questions to be answered by investigating the attitudes and opinions of students and mentors in relation to their mentoring practice. The thematic analysis gave rise to three main themes: the blurring of role boundaries, a difference in expectations and the importance of the relationship between student and mentor. It was found that students were unclear of the difference in expectation when working with their mentor and other sonographers, and that the boundaries between the two roles are blurred. There appeared to be a difference in expectations between the students and mentors; however, both groups were able to identify the strengths and ideal characteristics that they would expect to find in a mentor. These differences in expectations can be seen in the overall attitude of the students towards mentoring. Those mentors and students who understood each other's perspectives demonstrated empathy, as defined in Section 6.6.5; i.e. they understood each other's roles and could consider alternative perspectives. This resulted in an overall more positive attitude from the student regarding mentoring, compared with those who showed little empathy.

Based on the findings of these three aforementioned studies, changes were introduced to update support mechanisms and guidelines provided to mentors.

This chapter draws conclusions by discussing the findings as they relate to each research question in turn and explains how the findings have contributed to both knowledge and

practice. The ancillary question of the potential effect on pass rates will also be discussed. This chapter also presents details of how this work has already been disseminated to peers. Finally, details of future research plans are provided. Although not a specific research question, consideration of whether mentoring practice could potentially have a positive influence on the pass rates of the ultrasound clinical assessment was deemed relevant for inclusion.

7.2 Limitations

Due to the nature of research there will always be some limitations. Their presence will be acknowledged to demonstrate how they were addressed and minimised.

The advantages and limitations of the data collection methods were presented in Chapter 3, and it was concluded that the use of self-administered questionnaires and semi-structured interviews were the most appropriate methods. It is acknowledged that using focus groups might have resulted in different issues being identified by the mentors or students; however, the questionnaires and interviews ensured that each participant's response contributed to the findings: a limitation sometimes associated with focus groups. The inclusion of the pilot study is a recognised method of testing data collection methods, thus its inclusion within this research has increased the reliability of the data collection method.

The use of the variety of databases utilised to search for literature, outlined in Chapter 2, served to reduce bias within the literature review stage of this study. Outlining the search strategy in Section 2.2 allows for replication and limitation of bias.

Research bias can be evident particularly within the method design and data analysis stages. The use of the pilot study again aided in eliminating any potential bias within the wording of the questionnaires. Marshall and Rossman (1999) cite bias as a limitation of interviews; however, the inclusion of a standard introduction and wording of questions assisted in reducing bias within the interviews. Had the interviews been conducted by someone other than myself, then the level of bias may have been reduced further; however, this would be counteracted by the limitation outlined in Chapter 3 of having someone other than the researcher conduct the interviews. Bias was reduced within the data analysis stages by the use of Wordle™ to double-check the themes identified.

7.3 Research question 1

The first research question asked: What guidelines and support mechanisms may be shown to be effective in helping colleagues and students in mentoring practice?

Throughout the exploratory, pilot and main studies, information was gained which contributed to providing answers to this research question. The changes implemented as a result of reflecting on the findings of the three aforementioned studies, related to this research question will now be outlined.

7.3.1 Revised Clinical Portfolio

The clinical portfolio is a formative element of assessment within each clinical ultrasound modules. Within Section 2.15, the effectiveness of portfolios was considered. Buckley et al. (2009) and Tochel et al. (2009) state that how well a mentor completes a portfolio can impact on a student's engagement. It was therefore considered important to make changes to the current portfolio design in order to increase mentor engagement and feedback. In light of this, several changes were made to the clinical portfolios. The previous clinical portfolio included a grid for completion where mentors could indicate their opinion on the level of student attainment for specific ultrasound skills. Mentors were also asked to make comment on strengths and weaknesses at seven strategic dates throughout the year. Comments made during the exploratory study (Section 4.5.9), the pilot study (Section 5.5.4), and the main study (Sections 6.6.1, 6.6.64 & 6.6.6) indicated feedback was an important aspect of student learning. Therefore changes were made by the introduction of weekly written feedback forms completed by the sonographers whom the student had worked with during the preceding week. This would increase the level of feedback a student obtained whilst encouraging all sonographers to contribute to the feedback process, along with reducing pressure on the mentor as the only person responsible for providing feedback. The reason for this was that increased feedback could help the student progress and reflect on their strengths and weaknesses. The written feedback forms are then reviewed by staff at this University and discussed with the students. The benefit of including written feedback in the portfolio, as opposed to relying on verbal feedback, is that it can no longer be ignored. Constructive comments are noted by staff at this University and discussed further. It is intended in future that this change will ensure mentors cannot report that students ignore their feedback. It is also anticipated that weekly feedback will encourage the mentors to recognise the importance of their role and to refine the effectiveness of their feedback. As explained in Section 2.15,

both Tochel et al. (2009) and Buckley et al. (2009) discussed the advantages and limitations of portfolios to aid in student reflection and development. A substantial element of the redesigned portfolio now relates to feedback. Fugill (2005) and Evans (2013) maintain that feedback is an integral element of assessment and learning. Lizzio and Wilson (2008) describe the aim of feedback as "to enable the gap between the actual level of performance and the desired learning goal to be bridged" (cited in Evans, 2013, p. 71). Section 5.5.4 of the pilot study indicated that mentors would like to have more opportunities to give feedback to students. The importance of feedback was also investigated within the main study and it was found that when a student ignored their mentor's feedback, the mentor felt disappointed. It was for these reasons that weekly feedback on performance was included in the portfolio. How to use and action the feedback continues to be discussed with students on an individual basis by academic staff. The introduction of these feedback forms also formalised the mentoring process, a strategy advocated by Weinburg and Lankau (2011) as outlined in Section 2.16.

Another change to the clinical portfolio was the introduction of structured formative assessment as a platform to provide additional feedback on the student performance. Formative assessments are designed to prepare students for the summative assessment, hence the engagement with formative assessment can affect pass rates. Students in the pilot and main studies mentioned their desire for their mentors to undertake mock assessments with them. Weinburg and Lankau (2011) and Wang et al. (2010) advocate the benefit of a more formalised mentoring process, and the involvement of the mentor in the formative assessment is one method of formalising their role. Weinburg and Lankau (2011) and Stagg et al. (2012) also explain the benefits of getting the mentor to take more responsibility with regards to the role. This matches the students' aspirations that they wish their mentors to take more responsibility for them.

7.3.2 Developing Mentor training

During the research process, three new mechanisms were introduced to further help support those involved in the mentoring training. This is in addition to the ongoing guidance and support that continues to be available from staff at this University. The revised portfolio has previously been considered in Section 7.3.1. The two remaining methods of support and guidance are the development of mentor training and updating the mentor handbook. The changes to these will now be outlined.

Changes to the mentor training were made to address issues that arose through undertaking the exploratory study (Section 4.6.3 & 4.5.5), the pilot study (section 5.5.3) and the main study (section 6.5). It was deemed prudent to implement changes to mentor training as issues arose, rather than wait until the completion of the research.

The provision of mentor training became my responsibility from 2008 onwards. I continued delivering the training provided and developed by my predecessors. The contents of the historical mentor training sessions contained information regarding:

- Introduction to university staff
- The structure of the ultrasound course
- University rules and regulations
- The role of the supervisor
- How to complete the clinical portfolio
- Case study assessment
- Practical clinical assessment

During my first year in post at this University, I completed a PGCert in Learning and Teaching in Higher Education.

The aims of this course were to:

- Enhance participants' teaching practice by giving them practical and theoretical support to help them become effective and reflective practitioners
- Identify and demonstrate the relevance of key educational ideas, models and theories
- Encourage the demonstration and continuing development of practical competencies within the context of both the participants' own teaching activities and current debates on learning and teaching in higher education

- Encourage commitment to a scholarly approach to teaching and learning

(This University, 2005)

My predecessors had not completed the PGCert as it was not a requirement at the time of their employment, hence my approach developed from a different perspective and an increased knowledge of educational theory. With this underlying knowledge, the contents of the historical mentor training sessions were reviewed, and it was established that the training did not overtly include any mention of mentoring. There was no inclusion of discussions surrounding student support. The majority of the session was focused on assessments and rules and regulations. It was delivered in lecture format with little or no interaction and no activities. Reflecting back on this training, it appeared to lack appropriate content and was probably not very inspiring. Awareness was needed of the Mezirow (1997) theory of transformative learning: adults do not learn by being given knowledge, instead there should be activities that "include autonomous thinking … foster critical reflectivity … and are learner-centred, participatory, and interactive" (Mezirow, 1997, p. 10). The changes made to the mentoring training, considering the work of Mezirow, support the contribution the research has made to practice, which is discussed in Section 7.8.

An activity was included in the 2012/2013 mentor training which gave attendees opportunity to discuss aspects of mentoring. Detail was also provided about why feedback is given to students. The 2012/2013 training was seen as an improvement on the previous version, but still offered clear room for further development.

Following the exploratory study, the content of the mentor training provided on the programmes represented in the exploratory study were examined. My knowledge and enthusiasm about mentoring increased as I was able to identify the potential changes and improvements that could be made. This expedited a total overhaul of the ultrasound mentor training for the 2014 delivery because areas of good practice could be identified from other programmes that I consider to be of relevance and benefit to the ultrasound mentor programme. The content of the mentor training from 2014 onwards which is discussed below, including the rationale for the changes contains information regarding:

- Intended outcomes of the mentor training
- Activity 1 - What is mentoring

- Activity 2 – Mentor fact finding activity

- Setting goals for students

- Reflection on our mentoring

- Giving effective feedback

- Real life scenarios

Reference to current literature was integrated into the 2014 mentor training to demonstrate its theoretical underpinning, thereby supporting the findings of the exploratory study detailing sections 4.6.3 & 4.5.5, following its identification in the exploratory study as important, but absent. Quotes from respondents in the pilot study were also included in the slides to further highlight that the mentor training was both research based and responsive to new knowledge. The mentor training provided a blend of the dissemination of essential information alongside focussed group activities, which then led in to larger group discussions.

The learner-centred activities were all designed to encourage autonomous thinking, critical reflectivity, whilst being participatory and interactive (Mezirow, 1997) to ensure the intended outcome for those attending mentor training were achieved. The learning outcomes detailed at the outset were:

- Increase awareness of mentoring

- Strategies to support students

- Sharing practice with other mentors

The findings of the pilot study detailed in Chapter 5 indicated that support, one of the key concepts in the conceptual framework in Section 2.19, was an *expectation* of mentors by students, hence its inclusion as an outcome here. Sharing practice was included because, as explained in Chapter 4, there was found to be a range of mentoring styles. The opportunity to discuss with others can raise awareness of others' good practice and help recognise one's own good practices. Discussions regarding expectations of the mentor, arising from section 6.5 were integrated throughout the activities within the mentor training session.

The Activities for mentor training sessions were developed in alignment with the findings of the literature, and the exploratory, pilot and main studies as had been presented previously. The aims of the new mentor activities were to embed theoretical underpinnings into the

training and in turn to provide support and guidance for mentors through detailing expectations of them. Table 56 displays the format of the mentor session, the activities and the rationale for their inclusion.

Table 56

Mentoring activities		
Activity	Content	Rationale
1. What is mentoring?	Paired discussion: What do you expect from your students? What do you think your students expect from you? Group discussion of mentor responses. The students' responses were then presented to the mentors for discussion.	The theme of a difference in expectations was discussed in Chapter 6. In order to try and align expectations between the mentors and the students, this activity was introduced to encourage consideration of other viewpoints.
2. A fact finding activity	Paired activity followed by group discussion. Mentors were given 12 statements to discuss and categorise Discussion included: Integration of literature Reference to this research Setting goals Writing feedback. Each statement has key discussion points for the facilitator to highlight if not mentioned by the mentors.	This activity demonstrated that the mentoring practices are evidence based. A formality to the mentor process is encouraged. Skills in writing feedback are developed. Student support mechanisms are highlighted.

3. Reflection	Use of reflective cycle introduced.	To encourage reflection on their mentoring practices.
	Mentors encouraged to reflect on their learning from the session and its expected impact on their mentoring.	
	Reference made to intended learning outcomes and consideration of whether they have been achieved.	

When facilitating activity 1, it was ensured that mention of the selection and matching process of mentors was discussed as the literature review noted, Nick et al. (2012) and Straus et al. (2009) stated that the matching of student and mentor is crucial for a successful mentoring relationship therefore its inclusion in discussion was paramount.

Activity 2 included facilitated discussion regarding practical aspects of day to day mentoring. As was identified in section 6.6.1 and 6.8, the asking of questions to the student by the mentor in relation to the clinical indications, images they have taken, and reporting should be undertaken routinely between mentor and student, where time permits. This activity also linked with the conceptual framework presented in section 2.19 where the overlapping roles and duties of the mentor are discussed. Detail is provided regarding how to support students in difficult situations and where issues outside the control of the mentor may arise.

Reflection is included in Table 56 for a number of reasons; firstly, as detailed in Section 2.15, the NMC and HCPC require evidence of reflection from registrants as part of the continued CPD. The second reason for the inclusion of reflective activities arises from the discussion of tacit knowledge in Section 2.9 and the work of Kolb (1984) in relation to the experiential learning cycle; one of the stages of learning is that of reflection on what has been done and experienced. The final reason for the inclusion of reflection activities for mentors stems from Section 3.3.7 regarding phenomenology. Phenomenology is also said to include an element of a self-fulfilling prophecy (Appelbaum et al., 1994), which is a factor sometimes encountered

within mentoring, by encouraging mentors to reflect on their practices it is hoped any negative self-fulling practice be recognised and steps taken to eradicate them.

The feedback from the 2014 mentor training was entirely positive, and the section of the feedback form that asks attendees to indicate the least useful parts of the day was left blank by all. When asked to indicate the most useful parts of the day, most responded 'all'. Given this feedback, the training remained the same in 2015 and 2016, and again received positive feedback on both occasions. At this stage (2016-17 academic year) there still seems to be no need to further revise the mentor training. However, should negative feedback be received, or if new literature is published, the content will be reviewed.

Following the 2014 mentor training, a Senior Lecturer colleague who also teaches on the ultrasound programme in this University said:

> I could deliver the same content and it wouldn't be the same –
> it's because you're interested in mentoring that makes it good.
> (Cameron, C., Senior Lecturer, personal communication, 2014)

It is thought that part of the reason for the success of the mentor training and positive feedback is due to personal passion and enthusiasm for the subject. Cheung-Judge (2012) discusses the importance of having awareness of the trainer's potential influence within mentor training, when using the self as an instrument. When this particular piece of research is complete, my personal goal is to ensure that I maintain up-to-date knowledge and expertise in the area, through further research and reflection into my own and others' practice. The mentoring training also needs to be sustainable in my absence. The detailed structure and guidance notes produced for the mentor training will ensure its continuation despite any staff changes.

7.3.3 Updating the mentor handbook

The final support mechanism to aid in answering research question 1 was the updating of the mentor handbook. Section 5.5.3 of the pilot study responses to question 7 showed that the mentors viewed the handbook as a useful resource as it was, with 50% indicating there was nothing different they would like with regards to training and support. However, a revised version included more theoretical background to mentoring practices, since it was considered important to embed published literature within it as identified as important in section 4.5.9. The handbook was revised, despite the mentors' responses. Table 2 in Section 1.3 showed

that mentors do not have professional teaching qualifications; as a result, they might be unaware of the theoretical importance of certain aspects. So, corresponding to the four stage model of competence, the mentors might be currently *unconsciously incompetent* with regards to mentoring practices. The mentor training and mentor handbook can facilitate progressing to *conscious incompetence*, *conscious competence* and finally to the goal of *unconscious competence* in their mentoring. The origins of the model are uncertain, despite repeated references to it within literature: its development has been attributed to authors such as Burch, Maslow or Socrates; however no concrete reference could be identified.

Within the pilot and main studies, students indicated that they were unaware of the existence of the handbook, and went on to suggest some areas for inclusion, these being: 'details about assessment', 'contact details', 'outline of expectations' and information about 'body language and empathy'. Detail regarding the expectations of a mentor, mock assessment and how to give feedback were included, based on the findings of these studies. The handbook was also referred to during student induction sessions and students were encouraged to discuss the handbook with their mentors. The expanded content of the handbook and the increase in reference to it was intended to further support mentors in the role. It is interesting to note the requested mention of the inclusion of information regarding *empathy,* as this arose as a theme within the main study.

7.3.4 Summary of answers to research question 1.

The research question that asked 'What guidelines and support mechanisms may be shown to be effective in helping colleagues and students in mentoring practice?' has been answered in multiple areas as investigated by this study, three are direct support mechanism for mentors, and two for students. Following the study outcomes the following changes were brought in during the course of the study to improve mentoring practice, so it aligned with the research outcomes.

1. The introduction of increased, formalised feedback mechanisms within the clinical portfolio has been introduced to facilitate reflection and learning. This is a support mechanism completed by sonographers for students.

2. A more formalised process for undertaking formative clinical assessments was introduced. This supports both the mentor and the student in preparation for the final summative clinical assessment, linking with the literature review where Kilgallon & Thompson, (2012) presented their opinions that for the summative clinical

assessment, the opinion of the mentor is most valid. The importance of formative assessments are fundamental with HEI's, however their importance within the clinical setting is less well appreciated (information regarding the importance of this is now integrated within the next two points also.)

3. The mentor training offered to mentors was restructured to include more theoretical underpinnings. Linking with the conceptual framework the multifaceted role of the mentor to include supervision, support and teaching is discussed with attendees. In addition, this mentor training supports the three themes identified within Section 6.4.2, where discussion regarding blurring of role boundaries, difference in expectations and relationship between student and mentor are highlighted though the new activities. The mentor training is provided to directly support mentors, however it indirectly support students as the skills and knowledge obtained may be applied to supporting mentoring practice within the clinical departments.

4. The final method identified for providing guidelines and support mechanism is through the revised mentor handbook. The content of this provides a reference point for material covered during the mentor training day.

These improvements have been included as a direct result of the early findings to benefit students and mentors and are the result of the question being asked.

7.4 Research question 2

The second research question asked: What factors may influence the relationship between the mentors and mentees?

Throughout the exploratory, pilot and main studies, information was gained which contributed to providing answers to this research questions. The factors which may influence the relationship between the mentor and student identified as a result of reflecting on the findings of the three aforementioned studies, related to this research question will now be outlined. The two factors identified are characteristics of the mentor and the attitude of the student towards their mentor. Following the exploratory study it was decided that assignment of mentors according to gender did not have an influence on the relationship and as a result was not investigated further.

7.4.1 Characteristics of a mentor

Within the pilot and main studies, both questionnaires and student interviews asked about ideal characteristics that a mentor should ideally possess. Questions were asked about characteristics as it was thought that they may influence the relationships between a mentor and student.

It has been identified within the pilot and main studies that there are a number of characteristics or traits that an ideal mentor, teacher, or clinical supervisor should have. These have been cross-referenced with published literature and are amalgamated into Tables 57-60. It can be seen from Tables 57-60 that throughout these three studies, the findings from the mentors and students mainly support the findings of the literature review.

Table 57

Ideal characteristics according to Morton-Cooper & Palmer (1999)		
Role title	Characteristic	Mentioned within this study
Mentor	Advice	✓
Mentor	Coaching	
Mentor	Confidence building	
Mentor	Counselling	
Mentor	Creativity	✓
Mentor	Fulfilment of potential	✓
Mentor	Guidance	
Mentor	Interpersonal relationships	✓
Mentor	Networking	
Mentor	Risk taking	
Mentor	Role modelling	✓
Mentor	Self-development	✓
Mentor	Sharing	
Mentor	Social relationships	✓
Mentor	Sponsorship	
Mentor	Support	✓
Mentor	Teaching	✓
Mentor	Trust	✓

Table 58

Ideal characteristics according to Fugill (2005)		
Role title	Characteristic	Mentioned within this study
Clinical teacher	Approachable	
Clinical teacher	Availability	
Clinical teacher	Competence	✓
Clinical teacher	Consistency	
Clinical teacher	Practicality	
Clinical teacher	Punctuality	
Clinical teacher	Understand limits of student knowledge	

Table 59

Ideal characteristics according to Laschober et al. (2012)		
Role title	Characteristic	Mentioned within this study
Clinical supervisor	Deliver evidence based practice	✓
Clinical supervisor	Educate	✓
Clinical supervisor	Pass on knowledge	✓
Clinical supervisor	Promote professional development	✓
Clinical supervisor	Support	✓
Clinical supervisor	Train	✓

Table 60

Ideal characteristics according to Kilminster and Jolly (2000)		
Role title	Characteristic	Mentioned within this study
Clinical supervisor	Empathy	✓
Clinical supervisor	Flexibility in instruction	✓
Clinical supervisor	Good communication	✓
Clinical supervisor	Interest in supervision	✓
Clinical supervisor	Knowledge	✓
Clinical supervisor	Organisational skills	✓
Clinical supervisor	Support	✓

The findings of the pilot and main studies can also be linked with Section 2.17, which considered the use of the title of those doing the mentoring role. It was concluded in Section 2.17.5 that the role title does not matter as long as the person doing the role undertakes the required duties.

However in Table 58, where Fugill (2005) refers to the clinical teacher, only one of these characteristics was found within any of the pilot and main studies, leading to the consideration that the term *clinical teacher* is not appropriate for use within ultrasound. Nevertheless, I would suggest that all the characteristics presented in Table 58 would be desirable to have in a mentor. Conversely in Tables 59 and 60, all of the ideal characteristics of a clinical supervisor, according to the work of Laschober et al. (2012) and Kilminster and Jolly (2000), were mentioned within this study and I would consider are important characteristics for a mentor to possess.

The literature cited in Tables 57-60 demonstrates that there are common themes in clinical mentoring relationships that are transferable. There were 14 characteristics identified within the literature that were not identified by the students or mentors within the pilot and main studies. The words used within Tables 57-60 have been taken directly from the literature. However, if the meanings of the words are considered and comparable words of similar meaning accepted, then, there are seven other characteristics from Tables 57-60 that could then be claimed to have been mentioned within this study. These are shown in Table 61. For example, where Morton-Cooper and Palmer (1999) state *sharing* as an ideal characteristic, responses within my research said *pass on knowledge,* and these terms are considered comparable.

Table 61

	Literature		Characteristic from literature	Comparable term(s) within this research
Ideal characteristics noted within literature, not identified within this research				
1	Fugill (2005)		Approachable	Interpersonal relationships Social relationships
2	Morton-Cooper	and Palmer (1999)	Confidence building	Promote professional development Trust
3	Morton-Cooper	and Palmer (1999)	Guidance	Deliver evidence based practice Educate
4	Fugill (2005)		Practicality	Organisational skills
5	Fugill (2005)		Punctuality	Role modelling
6	Morton-Cooper	and Palmer (1999)	Sharing	Pass on knowledge
7	Fugill (2005)		Understand limits of student knowledge	Flexibility in instruction

On the other hand, there were nine characteristics mentioned within the pilot and main studies that were not directly found within the literature, when considered alongside comparable meanings, (shown in Table 62), the descriptions where comparable terms could not be found within the literature were *patience*, *perseverance* and being *self-critical*.

Table 62

	Ideal characteristics noted within **this research**, **not** directly identified within the literature		
	Characteristic from this research	Comparable term(s) within literature	Literature
1	Dedication	Fulfilment of potential Support Interest in supervision	Morton-Cooper and Palmer (1999)
2	Feedback	Guidance Pass on knowledge	Morton-Cooper and Palmer (1999) Laschober et al. (2012)
3	Listening	Good communication	Kilminster and Jolly (2000)
4	Motivational	Interest in supervision Role modelling	Kilminster and Jolly (2000) Morton-Cooper and Palmer (1999)
5	Pastoral	Counselling Fulfilment of potential Guidance Interpersonal relationships Support Approachable	Morton-Cooper and Palmer (1999) Fugill (2005)
6	Patience		
7	Perseverance		
8	Self-critical		
9	Sincerity	Trust	Morton-Cooper and Palmer (1999)

This consideration of comparable meanings supports previous discussion regarding considering things within a wider context, rather than considering standalone words. Table 11

in Section 3.3 showed that an advantage of using a qualitative approach to data collection is that the context and meaning can be considered, where this is not always possible with quantitative approaches. Section 5.4.6 of the pilot study and Section 6.13 of the main study again discussed the importance of considering the context of words.

The word *feedback* within Table 62 warrants further comment. Feedback, and the importance of it, is currently widely used within universities. There has been an increased focus on feedback in recent years since the commencement of the National Student Survey in 2005, where feedback receives the lowest scores year on year (The Higher Education Academy, 2013). It is expected that students would identify feedback as an important issue; however, due to the somewhat dated nature of the literature cited here, at the time of publication the word feedback might not have been used so frequently, hence its omission from Tables 57-60.

When the ideal characteristics between mentor and student pairings were matched, where students and their mentors provided a closely matched list, the student displayed a more positive overall attitude towards mentoring. On the other hand, where the student and the mentor provided no matches in their lists of ideal characteristics, the student displayed a more negative attitude towards mentoring. Therefore, in relation to the research question posed, one answer would be that a factor that influences the mentoring relationship is having shared expectations, developed from understanding each other's perspective.

Eby et al. (2010), Kay and Hinds (2005), Nick et al. (2012) and Straus et al. (2009), discuss the importance of carefully matching the student and the mentor. The pilot study suggested that the mentors who were involved in the selection process of the student tended to be more passionate and enthusiastic towards mentoring. This might be due to a sense of responsibility towards their clinical department, to produce an effective sonographer at the end of the programme of study. The passion and enthusiasm could also be due to the increased job satisfaction gained by being a mentor, as stated by Baranik et al. (2010) and discussed in Section 2.8. The mentor/student relationships which were perceived as negative were those where the mentor had not been involved in student selection. So it is proposed that another factor which influences the relationship positively between mentor and student is having the mentor involved in selecting the student who they will mentor (see Section 5.5).

In aiding the answering of research question 2, the data obtained within the pilot and main studies supports the work of Kay and Hinds (2005), Straus et al. (2009), Eby et al. (2010) and Nick et al. (2012) in that the matching of the mentor and student is an important aspect influencing the success of the relationship.

7.4.2 Attitude / Relationship

Within section 6.7 the attitude rating of students was presented. This was considered a factor which may have an effect on the students' relationships with their mentors.

The pilot study specifically asked students if they considered their mentor had an effect on their ability to pass the clinical assessment. Respondents SP1 and SP2 were purposefully selected due to a known positive relationship they had with their mentors. Their responses to this question regarding the effect of their mentor were: 'I could have passed without my mentor but not so easily' and 'Yes, my mentor helped but my personality did too'. These positive responses demonstrate a positive attitude toward training, when a good relationship between mentor and student is noted.

As discussed in Section 6.7 with regards to the attitude rating, where mentors and students who, as part of their relationship, demonstrate a high level of empathy (as defined in Section 6.6.5) the result is a student with a more positive attitude towards mentoring. Table 10 in Section 2.18, which summarised the findings of the literature review, showed that original ultrasound practices at this University were different from the recommendations within the literature. The link discovered between attitude and empathy led to the introduction of two new areas of practice, which it was anticipated would contribute to an improved relationship between mentor and student. The first new initiative was instigated within the induction session at the start of each new academic year.

In small groups, students were asked to discuss the following two questions:

1. What do you expect from your mentors?
2. What do your mentors expect from you?

After 20-30 minutes of discussion, each group reported back to the class for an overall discussion. Similarities and differences between expectations were noted. Permission was gained from the students to share their anonymised responses with the mentors.

A similar activity was implemented into the mentor training, outlined below, in relation to answering the research question 1. Following induction and mentor training, students were encouraged to arrange a conversation with their mentors where they could feedback on their expectations of each other. It is anticipated that this encouragement of discussion regarding expectations will further improve the relationship between the two from the outset, and set a foundation for honest discussions throughout the clinical assessment programme. Further research is required in order to investigate this further.

Additional evidence supporting this research question came from the student interviews in the main study, regarding feelings towards their mentor's attendance or non-attendance at the mentor training sessions. Four students presented negative responses regarding their mentor not attending mentor training. These comments included: 'concerned, worried, would it be a disadvantage to me'; 'confused'; 'they're not probably giving me 100%' and 'they just couldn't be bothered, it was just always too much of a hassle'. Although no conclusions were drawn regarding how the mentor's attendance at mentor training impacted on subsequent student results, non-attendance by the mentor can affect the student's attitude towards their mentor and thus affect their relationship.

7.4.3 Summary of answers to research question 2.

There were numerous characteristic mentioned within the literature, that were also identified within the pilot and main studies. Whilst it may not be realistic to expect a single mentor to possess all the characteristics mentioned within this section, it is thought that a mentor who possesses a number of these traits might have a better relationship with their student compared to those who do not have many of them. There are some characteristics that are inherent, such as sincerity, organisation and approachability; someone without these traits may not easy be able to develop them. There are other traits however that can be developed if one recognises the benefit of developing them.

The attitude displayed by the student towards their mentor can affect the relationship between them and their mentor. Activities to facilitate discussion of expectations is intended to have a positive influence on the attitude of the student, and thus lead to a better mentor / student relationship.

7.5 Ancillary consideration

Within section 1.6, the issues of whether the pass rates within obstetric, gynaecological and abdominal ultrasound modules could be related to mentoring practices was raised.

It is anticipated that the changes made within the portfolio outlined in section 7.3.1 in relation to feedback and formative assessment may have an effect on the pass rates; however, other variables need to be considered that may have also had an effect on the pass rates noted in 2015 and 2016. These variables include the purchase of a MedaPhor® transvaginal ScanTrainer® in 2012, and the installation of a new Philips Ultrasound system into a specialised laboratory space. These are used in formative tasks within the portfolio to be completed on this equipment.

Another consideration that could possibly have a minor effect on the pass rates for the clinical ultrasound modules is the engagement of the mentor in the completion of their student's portfolio, which involved giving clear feedback. In Chapter 5 it was indicated that more effective feedback was an area of development requested by mentors to further help them improve their mentoring role, as was considered in Section 7.3.1. The pilot study indicated that students would like their mentors to take more responsibility for them; for example, completing the feedback forms in the portfolio and undertaking mock assessments were two methods by which this could happen. It was mentioned in Section 6.5 that mentors were disappointed when a student ignored their feedback, so by altering the feedback mechanism in the portfolio, it is anticipated this will make it more difficult for a student to ignore mentor feedback. Section 2.11 presented differing opinions regarding whether the responsibility for the mentoring relationship lay with the mentor or with the student. Current practices within the ultrasound programme at this University, shown in Table 10 in Section 2.18, indicate that the responsibility for mentoring is placed with the mentor. This is in relation to the provision of feedback within the student's clinical portfolio and the undertaking of formative clinical assessments.

This University sets a threshold level for acceptable failure rates. At postgraduate level, this expectation, according to school guidelines, is that no more than 10% of students fail (This University, 2016). This threshold is considered important within the school; however, there is no research evidence to support the selected threshold values.

Each ultrasound clinical module has three elements of summative assessment: a written case study, an unseen objective structured clinical assessment (OSCE) and a practical clinical assessment. There is one element of formative assessment – the clinical portfolio, the changes to which have been explained in Section 7.3.1 so will not be repeated here. The pass rates for the theoretical components were above the threshold levels. Students are only permitted to take the summative clinical assessment if the theoretical comments have been passed.

I became the pathway lead for the PGCert/PGDip/MSc Diagnostic Ultrasound in 2008, at a time where failure rates for the ultrasound clinical assessments ranged from 33% to 67%: all below the threshold level. Figure 1.1 in Chapter 1 showed the pass rates for the ultrasound clinical assessments from 2009 to the 2014 cohort. Figure 7.1 is a replica of Figure 1.1 with the inclusion of the pass rates for 2015 and 2016.
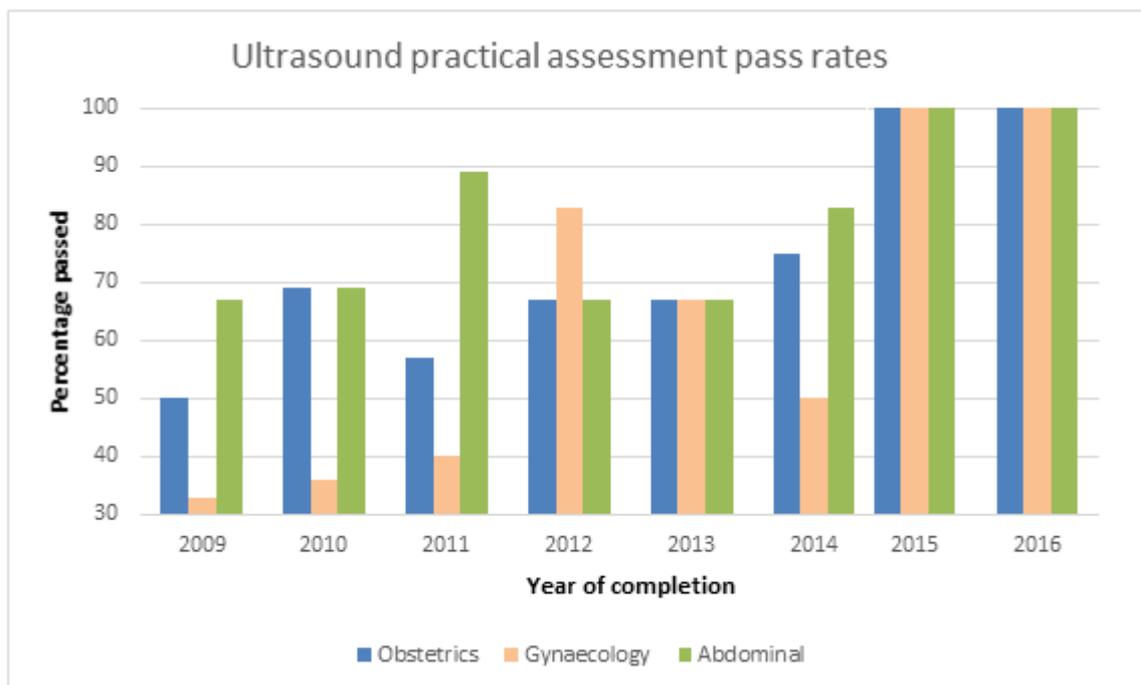
 Figure 7.1

It is shown in Figure 7.1 that the pass rate was 100% in 2015 and 2016. Whilst a causal link between the pass rate and changes detailed Sections 7.3 and 7.4 cannot be made, it is suggest that the changes made may have contributed to the increasing pass rates. It needs to be acknowledged that there are numerous other variables that may have impacted on the pass rates, such as university staff, funding, student demographic, mentor demographics etc.

In relation to Figure 7.1, it should be mentioned that the 2014 cohort, completing in 2015, was non-typical in regards to background professions. The 2015 cohort, completing in 2016, contained a more typical mix with only 50% of the cohort having a radiography background. As the pass mark for those completing in 2015 and 2016 was comparable it is deduced that in relation to this sample, the background profession of the sonographer does not affect their ability to pass, and although investigating this was not an aim of this research, this observation can be reassuring for future entrants.

7.6 Contributions to practice

The answers to the research questions stated in Chapter 1 have been presented above. Throughout the process of answering the research questions, contributions to both practice and knowledge have been made. This section will outline the specific contributions to practice. There are two areas to which this research has already contributed towards practice, one within the ultrasound programme and another in the undergraduate radiography programme; both of these will now be discussed.

7.6.1 Contributing to ultrasound practice

There have been contributions to ultrasound practice that have informed changes within the ultrasound programme at this University, and have made contributions to practice which have an impact beyond this University.

The second research question considered the factors that may influence the relationship between the mentors and students. This question was answered in Section 7.4 by consideration of the characteristics of a mentor along with expectations of a mentor and student in relation to attitude were detailed. Activities about expectations of a student and their mentor were introduced into both the student induction programme from the 2014 cohort onwards and into the mentor training from 2014. These activities have certainly impacted on this University's ultrasound students' knowledge of the expectations of mentors. There has also been a contribution to knowledge as a result of these activities, which is detailed in Section 7.7.

The dissemination of elements of this work related to roles and expectations of a mentor at the BMUS (2014) and UKRC (2016) conferences (detailed in Section 7.10) may have impacted upon many other radiographers and sonographers, including current, past and future mentors

and students. Presentation at these two conferences was intended to increase knowledge which can be applied to ultrasound practices.

As an increase in awareness of expectations was found within the findings of the main and pilot study, it was considered particularly important to include within the student induction and mentor training specific to the most recent (2016) cohort. Although not part of my research, the findings presented below arose from work informed by this research and provide further evidence of the contribution made to practice.

7.6.2 The 2016 cohort

During the 2016 student induction and mentor training sessions, the following questions were presented for discussion:

1. What do mentors expect from their students?
2. What do students expect from their mentors?

With permission, the students' responses were then presented to the mentors for discussion.

Appendix I provide the responses, in tabular form, from the 2016 induction session and first mentor training activity. The lists have been combined under categories based on that of Morton-Cooper and Palmer (1999) and are then presented alphabetically with duplicates removed. Where factors appeared from both the mentor and student perspective they are identified in **bold** typeface.

Some mentors indicated surprise that, as seen in Appendix I, Table 4, a student thought they were expected to perform menial tasks such as making cups of tea. It was advised that following the mentor training, mentors and students arranged to meet to discuss their expectations of each other and understand where differences in expectations occurred. By promoting discussion regarding expectations at the start of the course, it is expected this will enhance future mentor/student discussions.

Appendix I, Tables 2 and 4, show that the students' lists of expectations of themselves and their mentors was more extensive than their mentors' lists. It is pleasing that these students showed the high expectations appropriate to postgraduate level. The content of Appendix I can be related to the subthemes identified in Section 6.13. One such theme is that of mentor and student relationships and blurring of role boundaries, in that the mentor's role could be clarified during this discussion of expectations. For example, if the student thought the mentor

should teach theory and the mentor did not see that as part of their role, this could be made clear.

The theme of the mentor as a teacher was mentioned by both the mentors and the students during these activities; this again affirms that the original definition of the mentor provided in Chapter 1 is not correct in relation to ultrasound mentoring.

The students mentioned assessment as part of their expectation of their mentor, both formative and summative assessment as well as 'signing off as competent'. The mentors do not mention this as part of their role, linking with the overall theme of difference in expectations. This difference in the involvement of mentors in the assessment process was discussed in Chapter 2, where Kilgallon and Thompson (2012) and Kay and Hinds (2005) present opposing views. The situation within the ultrasound course at this University is that the mentor is integral to the summative assessment and is responsible for signing off as competent, alongside an ultrasound lecturer from this University.

Within Chapter 6 it was stated that 73% of students interviewed considered empathy as a characteristic that they would like to see in their mentors. Their mentors also identified this within their questionnaire response. However, empathy is only mentioned by the mentors in Appendix I, Table 1, with the students not making any mention of it. In Chapter 5, teaching about empathy was mentioned by the students as something that should be included at mentor training. Rather than make this a one-way move, teaching about empathy was also integrated into student induction. It is acknowledged that whilst one can teach *about* empathy, you cannot necessarily teach someone to *have* empathy.

The theme of time was not mentioned overtly; however, students commented they would like their mentor to be available and to arrange clinical hours, which are both time-related. With four out of the six subthemes identified in the thematic analysis in Chapter 6 being mentioned during the recent mentor and induction activities, this further adds weight to the expectation that the correct identification of themes occurred.

When comparing Appendix I, Tables 1 and 2, it can be seen that the list of expectations provided by the students was larger than the list provided by the mentors. It can also be seen that the significant elements expected of the mentor are in relation to functional or academic practices. Tables 3 and 4, which detail the expectations of a student, show that the students

again provided a larger list but both groups included more practical issues expected of the student. These four tables have confirmed what was proposed in the conceptual framework presented in Section 2.19. The role of the mentor is multidimensional, including to teach (shown in these tables as functional or academic), to support and to supervise the practical issues. There is also seen to be more detail within the answers in Appendix I, compared with the limited responses in the pilot study findings. After the third year of revised mentor training and updated student induction, practice has been influenced with regards to the increased level of understanding surrounding the expectations of the student and the mentor, as evidenced above.

7.6.3 Developing radiography mentor training

A further significant impact of the study surrounding ultrasound mentoring is a contribution to practice that has been made outside this University, within local NHS radiology departments. This demonstrates that my findings can be transferable to other professions.

My newly acquired zeal and excitement towards mentoring led to my appointment as the lead for the organisation and delivery of the undergraduate radiography mentor training programme. The 400 undergraduate radiography students undertake clinical placements within 21 NHS Trusts across London, Thames Valley, East Midlands and the East of England. Within each Trust, students work in all areas of radiology – coming into contact with numerous radiographers, each of whom is expected to take an active role in student training. This University advises mentors attend training every two years. Together with a radiography lecturing colleague, I revised the radiography mentor training to follow a very similar format to the ultrasound mentor training. The interactive activities were designed to encourage autonomous thinking, critical reflectivity, whilst being participatory and interactive (Mezirow, 1997) to ensure the intended learning outcomes for those attending mentor training were achieved. The learning outcomes detailed at the outset were:

- Strategies to support students
- Writing feedback
- Reflecting on mentoring experiences

Anecdotal evidence from radiography students and colleagues has shown a clear improvement in the written feedback for students on clinical placement by those who have

attended the mentor training. This is further evidence of the impact and contribution to radiography mentoring practices resulting from my Doctoral study.

7.6.4 Advanced radiography mentor training

Chapter 4 detailed the consideration of training of mentors specific to their experience, with different training options for new mentors, those with experience and those in managerial capacities. As a result, an updated advanced radiography mentor training session was developed in September 2016 for those who had previously attended the mentor training and now required their two yearly update. The additional learning outcomes of the advanced training were:

- Expectations of mentors and students
- Critiquing feedback

This updated session linked to a selection of the subthemes of my study identified in Section 6.13, while still being underpinned by the work of Mezirow (1997) and Kolb (1984).

This updated course was also accredited by The Society of Radiographers as contributing to CPD, and at the same time the 2014 version of the course was re-accredited. This is further evidence to show the contribution of this Doctoral study to broader practice in mentor training.

In 2015, the radiography mentoring team were nominated for a Vice-Chancellor's Award in the category of Excellence in Engagement with Business, Industry and the Professions. This nomination was evidence that my work within mentoring had been recognised by others.

7.7 Contributions to knowledge

In tandem with making a contribution to practice as outlined above, this piece of work has also made contributions to knowledge through the answering of the two research questions. The knowledge gained will be detailed in relation to each research question in turn and will then be followed by contribution of knowledge the ancillary consideration of pass rates and then knowledge specific to ultrasound. Final consideration will be of the contribution to support the work of others.

7.7.1 Contributions to knowledge in relation to Research question 1

This research has led to a number of refinements and developments in guidelines and support mechanisms available that may be effective in helping colleagues and students in their

mentoring practices. The specific resources developed include the revised clinical portfolio, the updated mentor training and the updated mentor handbook. Through these resources, the awareness of the key concepts of this research are disseminated, these being: the role of the mentor to *support*, *train* and *supervise* the student; taking into consideration the importance of aligned *expectations*; the clarity of role *boundaries* and the importance of the *relationship* between the mentor and the student. These concepts are a contribution to the knowledge and are not only specific to the mentoring of ultrasound students but can be applied to wider mentoring practices.

7.7.2 Contributions to knowledge in relation to Research question 2

It has been found, and was reinforced by the literature, that the key consideration that may influence the relationship between a mentor and mentee is having shared expectations, developed from understanding each other's perspective.

Mentors and students were asked about the ideal characteristics of a mentor. Their responses were compared and it was found that with those students and their mentors who provided a closely matched list, the student displayed a more positive overall attitude towards mentoring. On the other hand, where the students and the mentors provided no matches in their list of ideal characteristics, the student displayed a more negative attitude towards mentoring.

7.7.3 Contributions to knowledge in relation to ancillary consideration of pass rates

The contribution to knowledge made regarding pass rates within obstetric, gynaecological and abdominal ultrasound modules is that the background profession of the student sonographer does not affect their ability to pass the summative clinical assessment.

Others factors which might possibly have some effect on pass rate is related to the level of engagement the mentor and student have with formative elements of assessment in the revised clinical portfolio, giving feedback and undertaking mock clinical assessments, although the causality of this was not directly investigated. Changes in support and guidance provided to mentors in the form of the mentor training and updated mentor handbook might also have contributed to changes in pass rates, again this was not directly investigated.

7.7.4 Ultrasound knowledge

The results of question 10 from the pilot study (Section 5.5) showed that 50% of mentors also have involvement with training ultrasound students from other universities. Those mentors who attend mentor training and learn from taking part in activities and discussions can take this knowledge and apply it in other situations. A sonographer may be involved with the training of ultrasound students from other universities. They may also be involved with the training of doctors, radiographers, nurses or midwives, and their knowledge regarding characteristics of an effective mentor can be applied to a wider audience. Therefore, it can be claimed that this research study has had an impact to those outside the ultrasound profession.

As outlined in Chapter 2, there is very limited literature published regarding mentoring within Allied Health Professions and no previous literature reviews specific to the ultrasound profession. This piece of work has contributed to knowledge in this area.

It has been found that the term *mentor* does not have the same meaning to all professions, as detailed in Chapter 4. The results of the exploratory study demonstrated that the term for the role of mentor as used within the ultrasound programme did not match with the term of mentor as used within other programmes within the School of Health and Social Work.

Although the foremost purpose of the pilot study was to test the data collection methods prior to the main study, there were some important findings that arose from the data. When asked about mentoring experiences, the mentors and the students presented different views regarding expectations, particularly in relation to support (Section 5.9). This was reinforced within the main study, where a difference in expectations was identified as one of three overall themes.

The pilot and main study both identified time as a challenge encountered by mentors and students. There was again found to be a difference in expectations regarding amount of time spent together, either scanning or undertaking discussions and tutorials. This highlighted the importance of the mentors attending the training provided, to ensure they are aware of the requirements of the mentor role. These differences in expectations can be highlighted when considering the overall attitude of the students towards mentoring. Those mentors and students who understood each other's perspectives demonstrated empathy, as defined in Section 6.17, and this resulted in an overall more positive student attitude regarding mentoring compared with those who showed little empathy.

The main study identified that the relationship between the mentor and the student is expected to change over the duration of the training period. The importance of this relationship was identified within the literature review in relation to other professions, and has been confirmed through the main study findings.

There were three main themes identified through the data analysis of the main study. These contribute to knowledge specific to ultrasound mentoring practices. These themes identified were: *blurring of role boundaries*, *difference in expectations*, and *relationship between student and mentor*. Raising awareness of these themes at student induction and mentor training sessions is intended to promote discussions between mentors and students, with the aim of clarifying the role boundaries and supporting the development of common expectations.

7.7.5 Supporting the work of others

As a result of the conducting and analysis of pilot and main studies, there has been support of prior theory, thus adding to the knowledge in this area. Referring to the summary of the literature in Table 10, Section 2.18, my findings support the work of Stagg et al. (2012) and Weinburg and Lankau (2011), with regards to the mentor being the one to take responsibility for the management of the mentoring relationship.

Kowtko (2010), Meinel et al. (2011) and Nick et al. (2012) all describe that the mentoring process should be more formalised. The findings from the main study support this, and as such, changes in practice within the ultrasound course at this University were made, as detailed earlier in this chapter.

Eby et al. (2010); Meinel et al. (2011); Poteat et al. (2009), and Straus et al. (2009), give consideration to the relationship between the mentor and the student. One of the three main themes identified within the main study was that of the relationship between the mentor and the student, thus this is evidence that this piece of research has added a new additional study that contributes to supporting prior knowledge regarding mentoring.

7.8 Dissemination of work supporting contributions to knowledge and practice

At the time of writing, my work has been disseminated in five different arenas, offering evidence of a contribution to knowledge and to professional practice.

1. I was invited to present the findings of my exploratory study at the Department of Allied Health Professions and Midwifery Annual Clinical Research Forum and the Council for Allied Health Professions Research Event in September 2014. Attendees came from a range of professional backgrounds, both internally and externally to the university.

2. Following acceptance of a peer-reviewed abstract based on the exploratory study, I contributed a poster for the British Medical Ultrasound Society's annual scientific meeting in December 2014. See Appendix R.

3. In order to reach a wider audience, the next submission of an abstract, based on my pilot study, was to the United Kingdom Radiological Congress. The submission was peer reviewed and I was invited to present a poster at the June 2015 event. The poster was presented alongside a handout. Over 300 handouts were taken by attendees over the three day event. Copies can be found in Appendix S.

4. The Erasmus+ programme provides UK staff with the opportunity to teach abroad on an exchange programme. Following submission of our curriculum vitae, a colleague and I were selected and awarded funding to visit the Oslo and Akershus University College of Applied Sciences in August 2016. I was asked to demonstrate this University's ultrasound mentor training programme for their clinical staff and talk to their students about mentoring. In the end, I was personally unable to attend due to health restrictions at the time but my colleague facilitated the mentor training on my behalf, using my materials. The clinical and university staff, along with the Norwegian students, reported this to be a very useful and informative process.

5. Contributing to this University's theme of global awareness, the revised mentoring programme has been developed for a franchise radiography programme in Cyprus. During a visit in September 2016, the team I led provided mentor training for their key radiography staff; the local team will in turn train all the radiographers in Cyprus who mentor students on this University's franchise programme. Copies of the feedback cards and the mentoring resources were provided to them to facilitate the ongoing mentor training.

7.9 Recommendations & Future work

In October 2016, I contributed to a team from this University who successfully gained the tender for a clinical mentorship programme for paramedics in the East of England. I was invited to take part in this, due to my Doctoral work in the area of mentoring. This project will take place over the coming three years, providing a non-accredited two day course and a 15 credit face-to-face course, along with distance learning options. My involvement within this would not have been possible without this Doctoral study and I intend to continue sharing my acquired knowledge to benefit these courses.

In order to further evaluate the impact of the mentor training provided, both on the radiography and ultrasound courses, an application was made to the 'Early Career and Returning to Research Staff' Research Grants Competition for 2016/17. Due to my Doctoral study I was not permitted to be the main named person on this bid; however, the colleague who runs the mentor training alongside me applied, with me named as supporting staff. If the application is successful, an external person will be employed to evaluate the impact of the mentor training and advice on any alterations considered necessary to improve it further.

It was beyond the remit of this study to ascertain a correlation between perceived poor mentoring and extension to, or performance in, assessment – but it is something that will be taken forward in future research.

Arising from the exploratory study the concept of joint mentor training between programmes / profession was proposed. The benefit of such joint training could be increased sharing of practice between professions and better staff efficiency in delivery,

Support mechanism in the form of the mentor handbook and mentor training will continue to be updated and delivered regularly. Issues of empathy, characteristics and awareness of expectations are included. The activities undertaken during mentor training could be adapted for use with other professional groups, and also outside of healthcare settings.

Future research could investigate the link between pass rates and engagement with both formative assessment mechanisms and mentor support and guidance provided.

7.10 Transferability and generalisability

This research focused on a small sample size of students and mentors at one UK university; however, the key findings and conclusions regarding those aspects which can impact mentoring training have been applied to other ultrasound courses and across other health professions, as shown in the dissemination of findings section with the mentor training for radiographers as detailed in Section 7.8.

The conclusions can also be applied successfully beyond the healthcare and educational remit. I have already been able to apply the principles learned regarding relationships, expectations and boundaries to mentoring within other sectors in which I am involved, such as church and event catering. It is likely that the findings can be relevant to other domains also, due to the relational nature of mentoring. However, these have not yet been explored.

During the five-year duration of this research, there have been many changes to ultrasound training across the UK at other universities. Direct entry postgraduate courses now allow entrants with no health backgrounds to apply, including the first undergraduate ultrasound course in September 2016. Consultation is ongoing regarding apprenticeships within ultrasound. It was outside the scope of this research to consider these; however, the findings of this study regarding mentoring can be applied to the direct entry postgraduate and undergraduate ultrasound developments.

7.11 Final conclusions

The conceptual framework outlined within Chapter 2 has shown that the key concepts of the mentor role are to *support*, *train* and *supervise* the student. This should be done taking three issues into consideration. Firstly, the importance of aligning *expectations* between the student and the mentor. Secondly, there needs to be clarification of role *boundaries* between mentors, sonographers and assessors. Thirdly and finally, the importance of continual reflection in the *relationship* between the mentor and the student. These three factors can help result in a student with a more positive attitude towards mentoring and a higher pass rate in the clinical assessment. The initial aim of this thesis, as stated in Section 1.2: to investigate the factors that affect the mentoring of ultrasound students during the clinical element of their programme of study is considered to have been met, resulting in a variety of contributions to both practice and knowledge.

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Appendices

Appendix A: Paperwork relation to Ethical applications.

UNIVERSITY OF HERTFORDSHIRE
SOCIAL SCIENCES, ARTS AND HUMANITIES

M E M O R A N D U M

TO	Naomi Brown
CC	Dr Amanda Jeffereis & Dr Trevor Barker
FROM	Caroline Large, Social Sciences, Arts and Humanities ECDA Chairman
DATE	5/12/13

Protocol number: EDU/PG/UH/00387

Title of study: An exploration of mentoring within Ultrasound clinical practice

Your application for ethical approval has been accepted and approved by the ECDA for your school.

This approval is valid:

From: 1/1/14

To: 1/1/16

Please note:

Approval applies specifically to the research study/methodology and timings as detailed in your Form EC1. Should you amend any aspect of your research, or wish to apply for an extension to your study, you will need your supervisor's approval and must complete and submit form EC2. In cases where the amendments to the original study are deemed to be substantial, a new Form EC1 may need to be completed prior to the study being undertaken.

UNIVERSITY OF HERTFORDSHIRE
SOCIAL SCIENCES, ARTS AND HUMANITIES

ETHICS APPROVAL NOTIFICATION

TO	Naomi Brown
CC	Dr Amanda Jeffries & Dr Trevor Barker
FROM	Dr Timothy H Parke, Social Sciences, Arts and Humanities ECDA Chairman
DATE	13/05/15

Protocol number: **aEDU/PG/UH/00387**

Title of study: An exploration of mentoring within Ultrasound clinical practice.

Your application to modify the existing protocol **EDU/PG/UH/00387** as detailed below has been accepted and approved by the ECDA for your school.

Modification: Revised question in interviews and questionnaires

This approval is valid:

From: 13/05/15

To: 01/01/16

Please note:

Any conditions relating to the original protocol approval remain and must be complied with.

Approval applies specifically to the research study/methodology and timings as detailed in your Form EC1 or as detailed in the EC2 request. Should you amend any further aspect of your research, or wish to apply for an extension to your study, you will need your supervisor's approval and must complete and submit a further EC2 request. In cases where the amendments to the original study are deemed to be substantial, a new Form EC1 may need to be completed prior to the study being undertaken.

Should adverse circumstances arise during this study such as physical reaction/harm, mental/emotional harm, intrusion of privacy or breach of confidentiality this must be reported to the approving Committee immediately. Failure to report adverse circumstance/s would be considered misconduct.

Ensure you quote the UH protocol number and the name of the approving Committee on all paperwork, including recruitment advertisements/online requests, for this study.

Students must include this Approval Notification with their submission.

Appendix B: Questions and Interview prompts – Pilot study:

1. Please can you tell me about your experiences of the mentoring you received during your ultrasound training?

Prompts
Can you give me some examples of the good practices your mentor demonstrated?
Can you give me some examples of the poor practices your mentor demonstrated?
Was there anything you would have liked your mentor to do differently and why?

2. Please can you describe your relationships with your mentor

Prompts
Did this change throughout the duration of the course?
Did you have any say in who your mentor was?
Did you know them before you started the course

3. The university provides a mentor handbook and mentor training for all mentors. What do you think should be included in the handbook and training sessions?

Prompts
Did you know about the handbook?
Have you seen a copy of the mentor handbook?
Did your mentor refer to it?
Do you know if your mentor attended training?
Did they seem confident on knowing how to mentor you?

4. If you were asked to be a mentor in the future, what would you make as your priorities in this role?

Prompts
Why would you want to or not want to be a mentor?
Do you think you would be good/bad at it and why?
How structure the role?
What support would you want from University?

For recently qualified sonographers:

5. a. Did you pass your clinical assessment first time?

Prompts
In your opinion did mentoring affect your ability to pass the clinical assessment?

If no, could you have passed without them?
If yes, ask for more details

For current students:

5. b. Do you think the mentoring you are receiving   will affect your ability to pass the clinical assessment?

If no, could you could pass without them?
If yes, ask for more details

6. Is there anything else you would like to tell me about mentoring of ultrasound students?

Appendix C: Questionnaire for mentors – Pilot study

<u>Demographic details:</u>

Name:

Department(s) where you worked as a mentor :

Names of the University of Hertfordshire students which you have mentored:

1. How were you selected to be a mentor?   Please tick all that apply

☐ I've always been the student mentor in this department

☐ I was the only volunteer

☐ I was one of a few people who volunteered

☐ I'm passionate about the mentoring and teaching students

☐ Randomly selected

☐ I was given no choice but was happy to be a mentor

☐ I was given no choice and did not want to be a mentor

☐ Rather not say

☐ Other, please give details:

2. Did you have any involvement in selection of the student for training? Please tick all that apply

☐ Yes, shortlisting of applicants

☐ Yes, interviewing of applicants

☐ Was asked to be involved but declined

☐ No involvement

☐ Other, please give details:

3. Please can you give some examples of the good practices you think you demonstrate in your mentoring

274
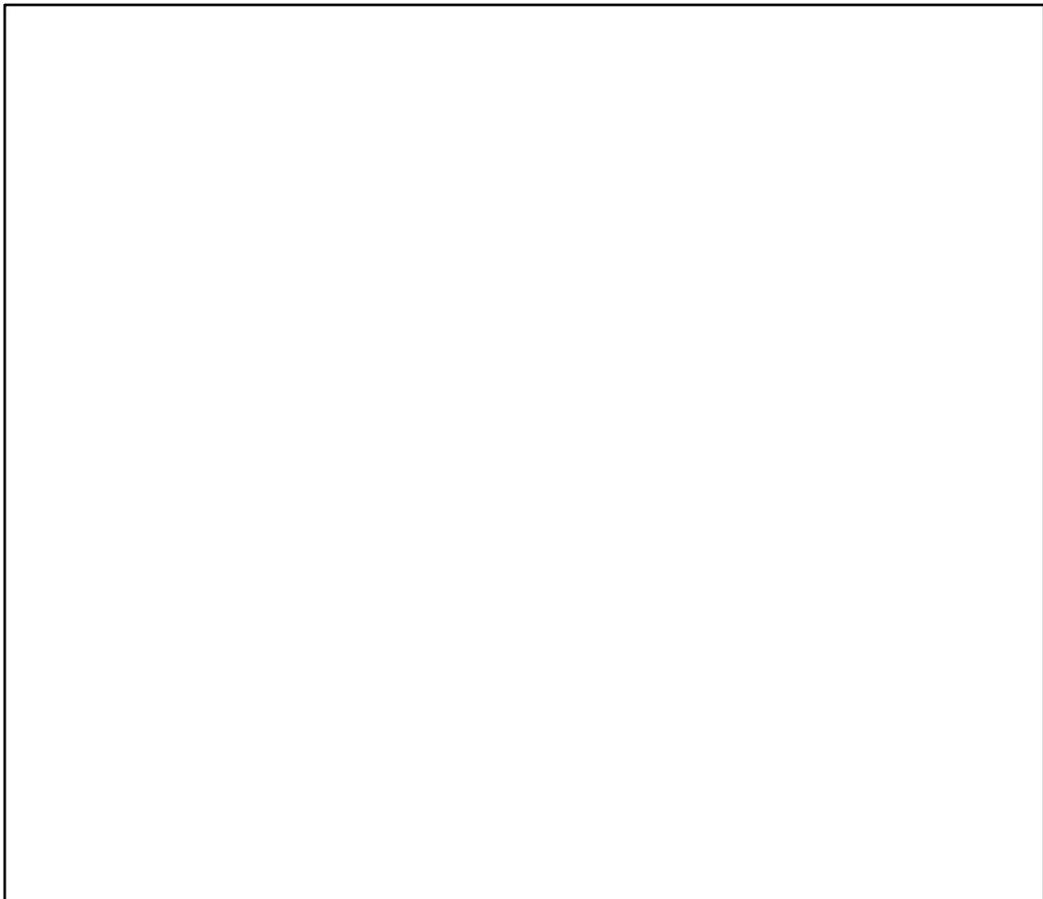
4. Please can you give some examples of the things you would like to do differently in relation to your mentoring if there were no constraints.

5.

6. What if any, constraint do you encounter in your mentoring   Please tick all that apply

☐ None

☐ Lack of support from University

☐ Lack of support from Department managers

☐ Lack of support from colleagues

☐ Time

☐ Student motivation/enthusiasm

☐ There are constraint but rather not give details

☐ Other, please give details:

7. Please can you describe what you consider to be the ideal relationships between mentor and student and if this changes over time

8. To what extent did you use the mentor handbook provided by the University of Hertfordshire?   Please tick all that apply

☐ Didn't have a handbook

☐ Read it at the start then not again

☐ Made regular use over year

☐ Directly prior to assessment

☐ Had a copy but did not read

☐ Found it a useful resource

☐ Found it an unhelp resource

☐ Other, please give details:

9. Please think about the two mentoring training days offer by the University of Hertfordshire   Please tick all that apply

☐   Invited to training day 1 in timely manner

☐   Invited to training day 1 but needed more notice

☐   Invited to training day 2 in timely manner

☐   Invited to training day 2 but needed more notice

☐   Attended training day 1

☐   Attended training day 2

☐   My department could not support me to attend

☐   Attended in the past and did not want to attend

☐   Not interested in attending

☐   Training day 1 is useful

☐   Training day 2 is useful

10. Please give details of any improvements in training or support you would like the University to provide to help you in your mentoring role

11. Have you had experience training ultrasound student from other Universities in the UK?   Please tick all that apply

☐ No

☐ Yes. Their mentoring training and support is comparable to the University of Hertfordshire

☐ Yes. Their mentoring training and support is better than the University of Hertfordshire

☐ Yes. Their mentoring training and support is not as good as the University of Hertfordshire

☐ Other, please give details.

12. Please use this space to add any further comments you have about the mentoring of ultrasound students in clinical practice.

Appendix D: Interview questions -Main study

Semi structured Interviews   - Questions

Anonymity code:

Anonymity code of mentor:

1. Please can you tell me about your experiences of the quality of mentoring you received during your ultrasound training?

Prompts
Can you give me some examples of the good practices your mentor demonstrated?
Can you give me some examples of the poor practices your mentor demonstrated?
Was there anything you would have liked your mentor to do differently and why?

Follow up questions:
How did you feel when 'good example' happened?
Why did you think your mentor did 'good example'
What is it like to experience 'poor mentoring' practices?
Why do you think your mentor did 'poor example'
Do you think your mentor realises the 'poor example' was perceived as poor by you?

2. Please can you tell me some of the characteristics you think an ideal mentor should have?

   Follow up questions:
   Which of these do you think are the most important?
   Which of these do you think your <u>mentor</u> would identify as the most important?
   Did your mentor have many of these characteristics?

3. Please can you tell me some of the role/duties you think an ideal mentor should do?

   Follow up questions:
   Which of these do you think are the most important?
   Did your mentor do many of these roles?

4. Please can you tell me some of the characteristics you think sonographer who is working with you should have?

   Follow up questions:
   Which of these do you think are the most important?
   Which of these do you think the sonographer would identify as the most important?
   Did many of the sonographer have these characteristics?

5. Please can you tell me some of the role/duties you think a sonographer should do when working with you?

Follow up questions:
Which of these do you think are the most important?
Which of these do you think the sonographer would identify as the most important?
Did many of the sonographer undertake these roles?

6. Please can you tell me some of the characteristics you think the person performing your summative clinical assessment should have?

   Follow up questions:
   Which of these do you think are the most important?
   Which of these do you think the assessor would identify as the most important?

   Follow-up up question: Are the boundaries clear between roles?

Please can you describe what you consider to be the ideal relationships between the student and their mentor?

   7. at the start of the course
   8. during the course
   9. just prior to your assessment

   10. How did you feel when your mentor gave you positive feedback?

   11. How did you feel when your mentor had to give negative feedback to you?

The university provides a mentor handbook and mentor training for all mentors.

   12. Do you know if your mentor attended the training?

Follow up questions – depending on previous answers
Did you notice a different in the practice after they attended training?

How did it make you feel if your mentor didn't attend?

13. Did your mentor mention or make use of the handbook?

Follow up questions:
Did you know about the handbook?
Have you seen a copy of the mentor handbook?
What do you think should be included in the handbook?

14. In the future, would you be interested in being a mentor?

Prompts
Why (strengths and weaknesses)
What would you make as your priorities in this role?

15. Is there anything else you would like to tell me about mentoring of ultrasound students?

Appendix E: Questionnaire for mentors - Main study
Anonymity code:

1. Please detail how you were selected to be a mentor.

2. Please explain how you felt when you were identified as a mentor

3.   What involvement did you have in selection of the student for training?

4.   Please identify by placing a cross on the scale below, your satisfaction with your level of involvement in the student selection.

| Very Satisfied | Somewhat Satisfied | Neutral | Somewhat Dissatisfied | Very Dissatified |

5. Please can you list some of the characteristics you think an ideal mentor should have

| You can add or remove rows as required | Please tick the THREE you think are most important | Please tick the THREE you think your student would identify as the most important |

6. Please can you list some of the roles/duties your mentor role involves

You can add or remove rows as required	Please tick the THREE you think are most important	Please tick the THREE you think your student would identify as the most important

7. Please can you list some of the characteristics you think a sonographer who is working with a student should have

You can add or remove rows as required	Please tick the THREE you think are most important	Please tick the THREE you think your student would identify as the most important

8. Please can you list some of the roles/duties of a sonographer working with a student

You can add or remove rows as required	Please tick the THREE you think are most important	Please tick the THREE you think your student would

identify as the most important

9. Please can you list some of the characteristics you think the person performing your summative clinical assessment should have

You can add or remove rows as required	Please tick the THREE you think are most important	Please tick the THREE you think your student would identify as the most important

10. Are the boundaries clear between mentors, sonographer and assessors roles clear?
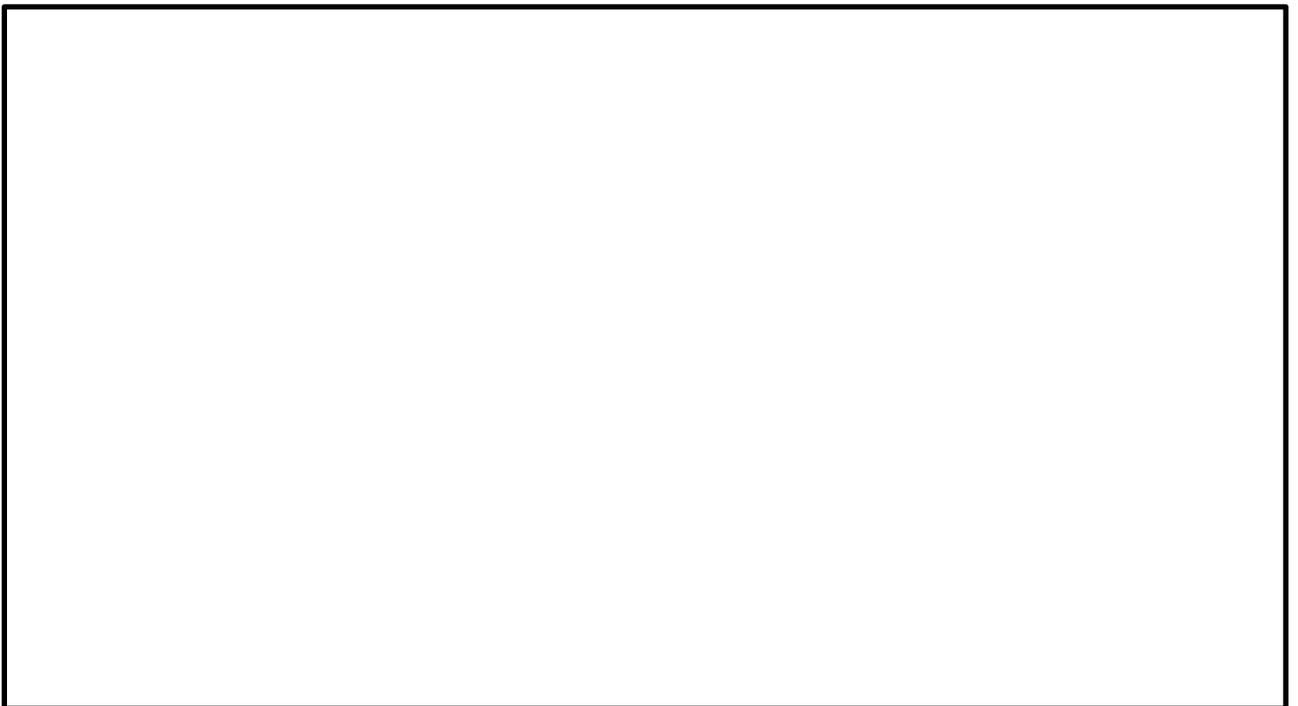
11. Please describe how you feel when you encounter factors which impact on your mentoring that are outside your control
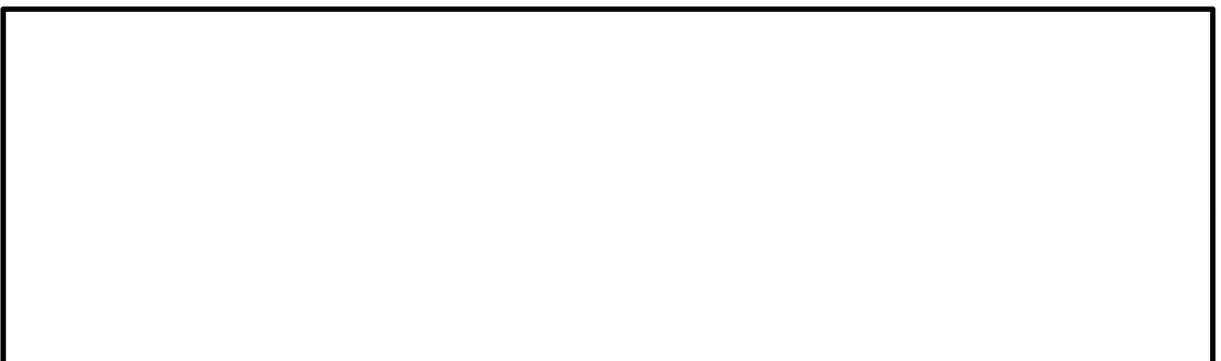
12. Please can you describe what you consider to be the ideal relationships between mentor and student

       a. At the start of the course

       b. During the course

       c. At the end of the course, just prior to their final assessment

13. Please give an example of the good mentoring you have demonstrated and describe how it made you feel.

14. Please explain how you would feel if your student ignored you, did not respond positively or is unmotivated.
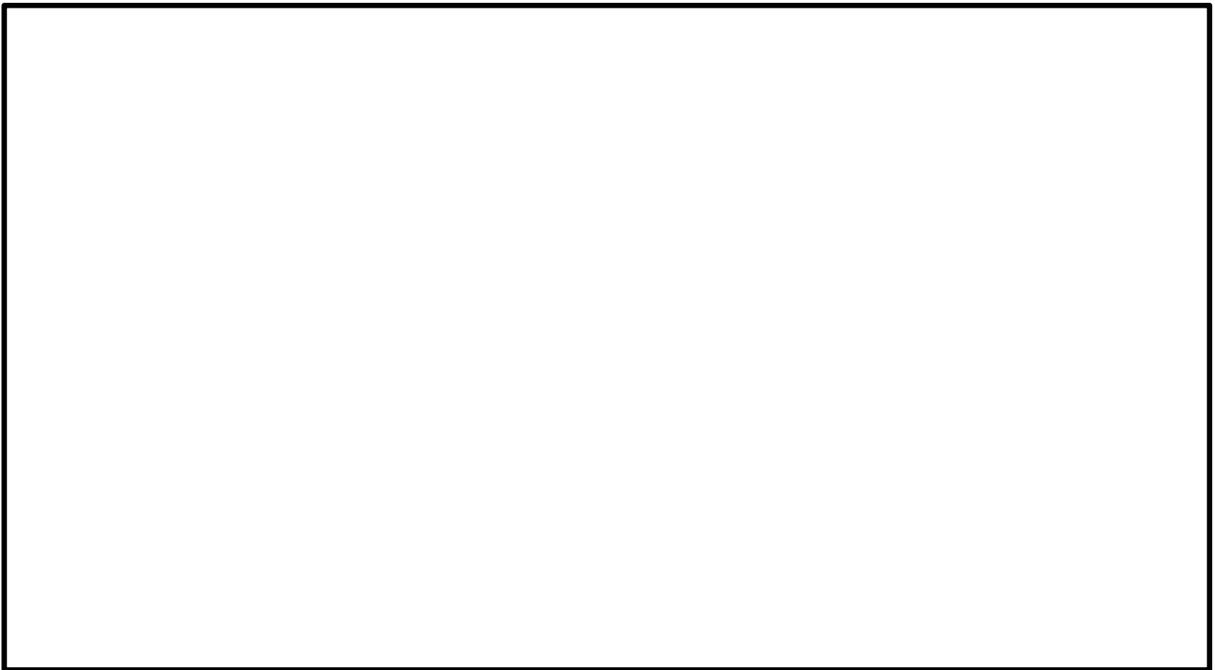
Please use this space to add any further comments you have about the mentoring, supervision and teaching of ultrasound students in clinical practice.

Appendix F: Attitude rating tables

Attitude rating tables completed by researcher.

S10

Measuring attitude towards mentoring: (intensity)	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5
My mentor also teaches me			✓3		
My mentor is organised			✓3		
My mentors does not spend enough time with me	✓5				
My mentor discuses images / examinations with me					✓5
I have confidence in my mentor				✓4	
Sonographers know what to do with me			✓3		
My mentor is good mentor					✓5
My mentor is not interested in my training		✓4			
Me and my mentor have different expectations			✓3		
I'm happy that my mentor is also assessing me		✓2			
I get good feedback on my progress			✓3		
I know what I need to do in order to improve			✓3		

I've had a bad mentoring experience	✓**1**				
I think I'll be a good mentor	✓**1**				

REVERSE score the *negatives*   **TOTAL score:**   49

S11

Measuring attitude towards mentoring: (intensity)	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5
My mentor also teaches me			✓**3**		
My mentor is organised		✓**2**			
My mentors does not spend enough time with me					✓**1**
My mentor discusses images / examinations with me	✓**1**				
I have confidence in my mentor	✓**1**				
Sonographers know what to do with me		✓**2**			
My mentor is good mentor	✓**1**				

My mentor is not interested in my training				✓1
Me and my mentor have different expectations			✓2	
I'm happy that my mentor is also assessing me	✓1			
I get good feedback on my progress	✓1			
I know what I need to do in order to improve		✓2		
I've had a bad mentoring experience				✓1
I think I'll be a good mentor		✓2		

REVERSE score the *negatives*   **TOTAL score:**   21

S12

| Measuring attitude towards mentoring: (intensity) | Strongly agree

1 | Agree

2 | neutral

3 | Disagree

4 | Strongly Disagree

5 |
|---|---|---|---|---|---|
| My mentor also teaches me | | ✓2 | | | |

	1	2	3	4	5
My mentor is organised			✓3		
My mentors does not spend enough time with me		✓4			
My mentor discuses images / examinations with me				✓4	
I have confidence in my mentor			✓3		
Sonographers know what to do with me			✓3		
My mentor is good mentor					✓5
My mentor is not interested in my training	✓5				
Me and my mentor have different expectations		✓4			
I'm happy that my mentor is also assessing me	✓1				
I get good feedback on my progress					✓5
I know what I need to do in order to improve				✓4	
I've had a bad mentoring experience	✓5				
I think I'll be a good mentor	✓2				

REVERSE score the *negatives*   **TOTAL score:** 50

S13

Measuring attitude towards mentoring: (intensity)	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5
My mentor also teaches me			✓3		
My mentor is organised				✓4	
My mentors does not spend enough time with me	✓5				
My mentor discuses images / examinations with me		✓2			
I have confidence in my mentor		✓2			
Sonographers know what to do with me				✓4	
My mentor is good mentor	✓1				
My mentor is not interested in my training					✓1
Me and my mentor have different expectations			✓3		

	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5
I'm happy that my mentor is also assessing me	✓1				
I get good feedback on my progress	✓1				
I know what I need to do in order to improve	✓1				
I've had a bad mentoring experience					✓1
I think I'll be a good mentor	✓1				

REVERSE score the *negatives*   **TOTAL score:**   30

S14

Measuring attitude towards mentoring: (intensity)	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5
My mentor also teaches me		✓2			
My mentor is organised			✓3		
My mentors does not spend enough time with me	✓5				
My mentor discuses images /		✓2			

examinations with me

I have confidence in my mentor	✓2			
Sonographers know what to do with me				✓5
My mentor is good mentor	✓2			
My mentor is not interested in my training		✓3		
Me and my mentor have different expectations			✓2	
I'm happy that my mentor is also assessing me	✓2			
I get good feedback on my progress	✓1			
I know what I need to do in order to improve	✓2			
I've had a bad mentoring experience			✓2	
I think I'll be a good mentor	✓1			

REVERSE score the *negatives*   **TOTAL score:**   34

S15

Measuring attitude towards mentoring: (intensity)	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5
My mentor also teaches me	✓1				
My mentor is organised			✓3		
My mentors does not spend enough time with me			✓3		
My mentor discuses images / examinations with me		✓2			
I have confidence in my mentor				✓4	
Sonographers know what to do with me					✓5
My mentor is good mentor			✓3		
My mentor is not interested in my training				✓2	
Me and my mentor have different expectations		✓4			
I'm happy that my mentor is also assessing me		✓2			
I get good feedback on my progress				✓4	
I know what I need to do in order to improve				✓4	

	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5
I've had a bad mentoring experience			✓3		
I think I'll be a good mentor			✓3		

REVERSE score the *negatives* **TOTAL score:** 43

S16

Measuring attitude towards mentoring: (intensity)	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5
My mentor also teaches me		✓2			
My mentor is organised		✓2			
My mentors does not spend enough time with me	✓5				
My mentor discusses images / examinations with me		✓2			
I have confidence in my mentor		✓2			
Sonographers know what to do with me					✓5

Statement	Strongly agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly Disagree (5)
My mentor is good mentor	✓1				
My mentor is not interested in my training				✓2	
Me and my mentor have different expectations			✓3		
I'm happy that my mentor is also assessing me	✓1				
I get good feedback on my progress	✓1				
I know what I need to do in order to improve		✓2			
I've had a bad mentoring experience					✓1
I think I'll be a good mentor		✓2			

REVERSE score the *negatives*   **TOTAL score:** 31

S17

Measuring attitude towards mentoring: (intensity)	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5

My mentor also teaches me ✓**1**

My mentor is organised ✓**3**

My mentors does not spend enough time with me ✓**2**

My mentor discuses images / examinations with me ✓**1**

I have confidence in my mentor ✓**2**

Sonographers know what to do with me ✓**5**

My mentor is good mentor ✓**1**

My mentor is not interested in my training ✓**2**

Me and my mentor have different expectations ✓**3**

I'm happy that my mentor is also assessing me ✓**1**

I get good feedback on my progress ✓**1**

I know what I need to do in order to improve ✓**2**

I've had a bad mentoring experience ✓**2**

I think I'll be a good mentor ✓**3**

REVERSE score the *negatives*   **TOTAL score:**   29

S18

Measuring attitude towards mentoring: (intensity)	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5
My mentor also teaches me		✓2			
My mentor is organised			✓3		
My mentors does not spend enough time with me				✓2	
My mentor discuses images / examinations with me			✓3		
I have confidence in my mentor	✓1				
Sonographers know what to do with me					✓5
My mentor is good mentor	✓1				
My mentor is not interested in my training				✓2	

	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5
Me and my mentor have different expectations			✓3		
I'm happy that my mentor is also assessing me		✓2			
I get good feedback on my progress	✓1				
I know what I need to do in order to improve		✓2			
I've had a bad mentoring experience					✓1
I think I'll be a good mentor	✓1				

REVERSE score the *negatives* TOTAL score: 29

S19

Measuring attitude towards mentoring: (intensity)	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5
My mentor also teaches me				✓4	
My mentor is organised			✓3		

My mentors does not spend enough time with me	✓**4**			
My mentor discuses images / examinations with me		✓**3**		
I have confidence in my mentor			✓**4**	
Sonographers know what to do with me				✓**5**
My mentor is good mentor		✓**3**		
My mentor is not interested in my training			✓**2**	
Me and my mentor have different expectations		✓**3**		
I'm happy that my mentor is also assessing me			✓**4**	
I get good feedback on my progress			✓**4**	
I know what I need to do in order to improve			✓**4**	
I've had a bad mentoring experience	✓**4**			
I think I'll be a good mentor	✓**2**			

REVERSE score the *negatives*   **TOTAL score:**   49

S20

Measuring attitude towards mentoring: (intensity)	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5
My mentor also teaches me	✓1				
My mentor is organised			✓3		
My mentors does not spend enough time with me	✓5				
My mentor discuses images / examinations with me				✓4	
I have confidence in my mentor		✓2			
Sonographers know what to do with me					✓5
My mentor is good mentor		✓2			
My mentor is not interested in my training				✓2	
Me and my mentor have different expectations			✓3		
I'm happy that my mentor is also assessing me	✓1				

	Strongly agree	Agree	neutral	Disagree	Strongly Disagree
I get good feedback on my progress		✓2			
I know what I need to do in order to improve		✓2			
I've had a bad mentoring experience					✓1
I think I'll be a good mentor		✓2			

REVERSE score the *negatives*   **TOTAL score:** 35

Attitude rating tables completed by second reviewer.

S10

Measuring attitude towards mentoring: (intensity)	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5
My mentor also teaches me			✓3		
My mentor is organised			✓3		
My mentors does not spend enough time with me				✓2	
My mentor discuses images /			✓3		

examinations with me

Statement				
I have confidence in my mentor			✓3	
Sonographers know what to do with me				✓4
My mentor is good mentor			✓3	
My mentor is not interested in my training			✓3	
Me and my mentor have different expectations				✓1
I'm happy that my mentor is also assessing me			✓3	
I get good feedback on my progress		✓2		
I know what I need to do in order to improve		✓2		
I've had a bad mentoring experience				✓1
I think I'll be a good mentor		✓2		

REVERSE score the *negatives* **TOTAL score:** 35

S11

Measuring attitude towards mentoring: (intensity)	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5
My mentor also teaches me	✓1				
My mentor is organised	✓1				
My mentors does not spend enough time with me	✓5				
My mentor discuses images / examinations with me	✓1				
I have confidence in my mentor	✓1				
Sonographers know what to do with me		✓2			
My mentor is good mentor	✓1				
My mentor is not interested in my training	✓5				
Me and my mentor have different expectations	✓5				
I'm happy that my mentor is also assessing me	✓1				
I get good feedback on my progress	✓1				
I know what I need to do in order to improve	✓1				

I've had a bad mentoring experience	✓**5**	
I think I'll be a good mentor		✓**2**

REVERSE score the *negatives*   **TOTAL score:**   31

S12

Measuring attitude towards mentoring: (intensity)	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5
My mentor also teaches me				✓**4**	
My mentor is organised					✓**5**
My mentors does not spend enough time with me					✓**1**
My mentor discusses images / examinations with me					✓**5**
I have confidence in my mentor					✓**5**
Sonographers know what to do with me			✓**3**		
My mentor is good mentor					✓**5**

	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5
My mentor is not interested in my training					✓1
Me and my mentor have different expectations					✓1
I'm happy that my mentor is also assessing me		✓2			
I get good feedback on my progress				✓4	
I know what I need to do in order to improve				✓4	
I've had a bad mentoring experience	✓5				
I think I'll be a good mentor		✓2			

REVERSE score the *negatives*   **TOTAL score:**   47

S13

Measuring attitude towards mentoring: (intensity)	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5
My mentor also teaches me		✓2			

Statement	1	2	3	4	5
My mentor is organised		✓2			
My mentors does not spend enough time with me				✓4	
My mentor discuses images / examinations with me	✓1				
I have confidence in my mentor	✓1				
Sonographers know what to do with me					✓4
My mentor is good mentor	✓1				
My mentor is not interested in my training	✓5				
Me and my mentor have different expectations				✓4	
I'm happy that my mentor is also assessing me	✓1				
I get good feedback on my progress		✓2			
I know what I need to do in order to improve		✓2			
I've had a bad mentoring experience				✓4	
I think I'll be a good mentor		✓2			

REVERSE score the *negatives*

TOTAL score: 35

S14

Measuring attitude towards mentoring: (intensity)	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5
My mentor also teaches me		✓2			
My mentor is organised			✓3		
My mentors does not spend enough time with me		✓4			
My mentor discuses images / examinations with me			✓3		
I have confidence in my mentor		✓2			
Sonographers know what to do with me				✓4	
My mentor is good mentor		✓2			
My mentor is not interested in my training		✓4			
Me and my mentor have different expectations		✓4			

I'm happy that my mentor is also assessing me			✓3		
I get good feedback on my progress	✓2				
I know what I need to do in order to improve	✓2				
I've had a bad mentoring experience			✓3		
I think I'll be a good mentor	✓1				

REVERSE score the *negatives* **TOTAL score:**   39

S15

Measuring attitude towards mentoring: (intensity)	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5
My mentor also teaches me		✓2			
My mentor is organised		✓2			
My mentors does not spend enough time with me			✓3		
My mentor discuses images /		✓2			

examinations with me				
I have confidence in my mentor	✓**2**			
Sonographers know what to do with me			✓**4**	
My mentor is good mentor	✓**2**			
My mentor is not interested in my training	✓**4**			
Me and my mentor have different expectations	✓**4**			
I'm happy that my mentor is also assessing me	✓**2**			
I get good feedback on my progress	✓**2**			
I know what I need to do in order to improve		✓**3**		
I've had a bad mentoring experience	✓**4**			
I think I'll be a good mentor	✓**2**			

REVERSE score the *negatives*   **TOTAL score:**   38

S16

Measuring attitude towards mentoring: (intensity)	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5
My mentor also teaches me		✓2			
My mentor is organised		✓2			
My mentors does not spend enough time with me		✓4			
My mentor discuses images / examinations with me		✓2			
I have confidence in my mentor	✓1				
Sonographers know what to do with me				✓4	
My mentor is good mentor	✓1				
My mentor is not interested in my training	✓5				
Me and my mentor have different expectations		✓4			
I'm happy that my mentor is also assessing me	✓1				
I get good feedback on my progress	✓1				
I know what I need to do in order to improve	✓1				

I've had a bad mentoring experience	✓5				
I think I'll be a good mentor		✓2			

REVERSE score the *negatives*   **TOTAL score:**   35

S17

Measuring attitude towards mentoring: (intensity)	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5
My mentor also teaches me	✓1				
My mentor is organised		✓2			
My mentors does not spend enough time with me	✓5				
My mentor discusses images / examinations with me	✓1				
I have confidence in my mentor	✓1				
Sonographers know what to do with me				✓4	
My mentor is good mentor	✓1				

My mentor is not interested in my training	✓5

Me and my mentor have different expectations	✓4

I'm happy that my mentor is also assessing me	✓2

I get good feedback on my progress	✓1

I know what I need to do in order to improve	✓1

I've had a bad mentoring experience	✓4

I think I'll be a good mentor	✓3

REVERSE score the *negatives*   **TOTAL score:** 35

S18

Measuring attitude towards mentoring: (intensity)	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5
My mentor also teaches me	✓1				

My mentor is organised	✓1				
My mentors does not spend enough time with me	✓4				
My mentor discuses images / examinations with me	✓1				
I have confidence in my mentor	✓1				
Sonographers know what to do with me				✓4	
My mentor is good mentor	✓1				
My mentor is not interested in my training	✓5				
Me and my mentor have different expectations	✓5				
I'm happy that my mentor is also assessing me		✓2			
I get good feedback on my progress		✓2			
I know what I need to do in order to improve	✓1				
I've had a bad mentoring experience	✓5				
I think I'll be a good mentor		✓2			

REVERSE score the *negatives*   **TOTAL score:**   35

S19

Measuring attitude towards mentoring: (intensity)	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5
My mentor also teaches me			✓3		
My mentor is organised			✓3		
My mentors does not spend enough time with me				✓2	
My mentor discuses images / examinations with me			✓3		
I have confidence in my mentor			✓3		
Sonographers know what to do with me				✓4	
My mentor is good mentor			✓3		
My mentor is not interested in my training			✓3		
Me and my mentor have different expectations					✓1

	Strongly agree	Agree	neutral	Disagree	Strongly Disagree
I'm happy that my mentor is also assessing me			✓3		
I get good feedback on my progress		✓2			
I know what I need to do in order to improve		✓2			
I've had a bad mentoring experience					✓1
I think I'll be a good mentor		✓2			

REVERSE score the *negatives*   **TOTAL score:**   35

S20

Measuring attitude towards mentoring: (intensity)	Strongly agree 1	Agree 2	neutral 3	Disagree 4	Strongly Disagree 5
My mentor also teaches me		✓2			
My mentor is organised			✓3		
My mentors does not spend enough time with me		✓4			
My mentor discuses images /		✓2			

examinations with me

I have confidence in my mentor	✓2		
Sonographers know what to do with me			✓3
My mentor is good mentor	✓2		
My mentor is not interested in my training	✓4		
Me and my mentor have different expectations				✓2
I'm happy that my mentor is also assessing me	✓2		
I get good feedback on my progress	✓2		
I know what I need to do in order to improve	✓2		
I've had a bad mentoring experience	✓4		
I think I'll be a good mentor	✓2		

REVERSE score the *negatives*   **TOTAL score:**   36

Appendix G: Findings from questionnaires - Main study

Question 5:

Please can you list some of the characteristics you think an ideal mentor should have.

Code	Response	Identified as most important by mentor	Which they think the student would identified as most important
MM11	Good communication	✓	✓
	Patience	✓	✓
	Lead by example	✓	✓
	Self-critical		
	Empathetic		
	Extensive knowledge of pathology		
MM15	Experienced	✓	✓
	Calm		
	Knowledge of guidelines	✓	✓
	Approachable		✓
	Listening skills	✓	
	Motivational		
	Enthusiasm		
	Ability to discuss cases		
MM16	Patience and understanding	✓	
	Calm		
	Ordered		
	Approachable	✓	

Code	Response	Identified as most important by mentor	Which they think the student would identified as most important
	Interested in teaching	✓	
	Good communication		
MM18	Skills	✓	✓
	Knowledge	✓	✓
	Patience	✓	✓
	Perseverance		
MM19	Knowledge of subject		
	People skills	✓	
	Patience	✓	
	Up to date knowledge	✓	
	Ability to teach		✓
	Ability to listen		✓

Question 6

Please can you list some of the roles/duties your mentor role involves

Code	Response	Identified as most important by mentor	Which they think the student would identified as most important
MM11	Assess technique	✓	✓
	Demonstrate excellence	✓	✓
	Check student is ok (stress)	✓	✓
	Liaise between student and doctor		
	Constructive criticism		

Rewarding study and exams

Take part in assessment and mocks

Teach technique

Teach pathology and anatomy

MM15	Listening		
	Instilling confidence		
	Guiding towards routine roles	✓	
	Completing portfolio		✓
	Time to allow shadowing	✓	✓
	Encouraging	✓	
	Discuss unusual/atypical cases		✓

MM16	Organisation of rota		
	Support to students	✓	
	Ensuring portfolio completed	✓	
	Liaising with other staff members	✓	
	Communication with university		
	Support to sonographers		

MM18	Teaching anatomy		
	Teaching machine controls		✓
	Teaching scan technique	✓	✓
	Observe the scan	✓	
	Rescan the patient if necessary		
	Correct the report		

Code	Response		
	Discuss learning points	✓	
MM19	Timetables	✓	
	Allocation / Rota	✓	✓
	Teaching		✓
	Listening to issues		
	Pastoral	✓	✓

Question 7:

Please can you list some of the characteristics you think a sonographer who is working with a student should have

Code	Response	Identified as most important my mentor	Which they think the student would identified as most important
MM11	Patience/time	✓	✓
	Good communication		✓
	Tolerance		
	Empathy	✓	
	Good technical ability		✓
	Good anatomical knowledge		
	Good knowledge of pathology		
MM15	Experience		✓
	Patience		

	Variety of exposure to normal and abnormal findings		
	Knowledgeable of local guidelines	✓	✓
	Approachable		
	Time to demonstrate and explain while scanning	✓	
	Referral pathways	✓	
MM16	Willingness to teach	✓	
	Patience	✓	
	Approachable		
	Good communication	✓	
MM18	Skills	✓	✓
	Knowledge	✓	✓
	Patience	✓	✓
MM19	Patience/time	✓	
	Listening skills		✓
	Ability to teach	✓	✓
	Knowledge	✓	✓

Question 8:

Please can you list some of the roles/duties of a sonographer working with a student

Code	Response	Identified as most important my mentor	Which they think the student would identified as most important
---	---	:---::	:---:
MM11	Demonstrate technique	✓	✓
	Demonstrate normal and abnormal anatomy	✓	✓
	Assess technique		
	Teach protocols for different examinations	✓	✓
	Make sure student understanding		
MM15	Identify patient	✓	✓
	Review history		
	Introduce oneself and student	✓	
	Prepare patient for scan		✓
	Prepare equipment		
	Inform patient student doing scan		
	Perform ultrasound methodically if possible		
	Record findings in report	✓	
	Explain findings as appropriately as possible		
	Interpersonal skills for referrals		
MM16	Practical skills and assessment of progress	✓	
	Liaise with mentor	✓	
	Discuss request card and clinical history		
	Research pathologies to allow discussion		
	Feedback to student	✓	

Code	Response	Identified as most important my mentor	Which they think the student would identified as most important
MM18	Teaching anatomy		✓
	Teaching machine controls		✓
	Teaching scan technique	✓	✓
	Observe the scan	✓	
	Rescan the patient if necessary		
	Correct the report		
	Discuss learning points with the student	✓	
MM19	Time allocations	✓	✓
	Ability to scan well		✓
	Communication with patient		
	Managing the list	✓	
	Looking after the patient		
	Looking after the student		✓
	Responsibility for the full package	✓	

Question 9:

Please can you list some of the characteristics you think the person performing your summative clinical assessment should have

Code	Response	Identified as most important my mentor	Which they think the student would identified as most important
	Good technical knowledge	✓	✓

		Col 1	Col 2
MM11	Good knowledge of anatomy	✓	✓
	High standards	✓	✓
	Patience		
MM15	Good interpersonal skills		
	Inform mentor of procedure for summative clinical assessment		
	Patience		
	Calm demeanour		
	Decisiveness		
MM16	Good communication	✓	
	Honest feedback and review of student progress	✓	
	Approachable to allow 2 way dialogue between student and assessor	✓	
MM18	No response		
MM19	Knowledge of what you have done		✓
	Knowledge of what you should know	✓	✓
	Knowledge of subject		✓
	Listening skills	✓	
	Communications skills	✓	
	Confidence		

Question 10:

Are the boundaries clear between mentors, sonographer and assessors roles clear?

Code	Response
MM11	In cases where the sonographer has been a fundamental part of the ultrasound team for quite a while, boundaries are difficult first as professional manner by the mentor and assessor must be maintained for a clinical assessment. Each individual would be made aware of the examination procedure and therefore this would make assessment easier and boundaries maintained.
MM15	The boundaries are unclear (somewhat) between sonographer and mentor. Only difference being signing the clinical portfolio.
MM16	Often the roles merge with mentor taking on role of sonographer and assessor. This is not detrimental.
MM18	Don't think so. In my department training is provided by sonographers who usually never had any specialisation in mentorship
MM19	Yes

Question 11:

Please describe how you feel when you encounter factors   which impact on your mentoring that are outside your control

Code	Response
MM11	If I need to leave when a student is part way through the course, I feel guilty that I give that for and cannot be there for their final eventual progression form student to sonographer. Staffing issues also frustrate me as a mentor when I

don't have the time to teach and discuss each case chosen by the sonographer in full.

MM15   I would have liked to have had the opportunity to attend the mentor training referred to in the handbook. If adequate time is not assigned to the student in relevant area of imaging that is frustrating.

MM16   No issues with mentoring role

MM18   Very frustrated. Training programmes are usually well structures and planned by the university but sometime local departments do no offer the necessary support to students or mentors

MM19   Sad, annoyed frustrated. Though a need to take control and sort. Isolation sometimes as I am left to pick up the pieces on my own. Can feel blamed

Question 12:

Please can you describe what you consider to be the ideal relationships between mentor and student

At the start of the course

MM11   Colleagues working together and the mentor leading by example

MM15   Trust is established and gained during the process

MM16   Supportive and encouraging

MM18   Mentor should make it clear to students there is a long way to the final destination

MM19   Friendly though with some distance

During the course

MM11	Colleagues working together and discussions arising more frequently
MM15	That the student may question any aspect of course/guidelines.
MM16	Supportive and encouraging
MM18	Mentor should provide feedback frequently and discuss learning points
MM19	Trust, approachable both ways

	At the end of the course
MM11	Colleagues working together in the knowledge that the student is ready to move on in the profession
MM15	Mutual respect. Encouraging and confidence building
MM16	Supportive and encouraging
MM18	Almost as a colleague. Show confidence in students skills
MM19	Trust, confidence

Question 13:

Please give an example of the good mentoring you have demonstrated and describe how it made you feel

MM11	Mentoring when a student while dealing with a difficult patient and the patient being quite aggressive. I showed the student to be patient and tolerant and explained with good communication skills what is required frequently in ultrasound, it made me feel like I was showing my confidence and that was a good teacher and mentor.
MM15	The student was quite anxious during all examinations, attempted to instruct on and practice mindfulness and breath control. The aim being to calm the student. Remind themselves "I can do this" and build self-esteem. Also remind the student around correct diagnosis she has made.
MM16	To me the sign of a good mentor is when my student has frank and open dialogue with me about their progress and any issues that have arisen. A well trained and motivated competent sonographer is my ultimate aim
MM18	Discussion after each scan about pathology and scanning technique
MM19	The student read on the patient face they were worried about something. The student asked the patient if they were ok. The patient wasn't and they explained why. I acknowledge this to the student and explained this was good practice, well done, this in turn encouraged the student in all areas.

Question 14:

Please explain how you would feel if your student ignored you, did not respond positively or is unmotivated

MM11	If a student ignored me I would see it that the student had the problem whatever was going on I would continue the student positively, I've never had this occur.
MM15	It would feel like time wasting and or insufficient utilisation of resources. Frustrating. Like she did not want to pass the clinical assessment. My reputation is partly 'on the line' also

MM16   Disappointed

MM18   I understand ultrasound training is a long process and there is always room for incorrect answers or lack of motivation

MM19   I am giving time to teach. It is hard work as well as managing a list I find it a real lack of appreciation if the student does not listen, we are only trying to help them. Life with a student isn't easy for us. I think mentors and sonographers are sometimes not appreciated until the student qualifies and has a student to teach. They can be quite selfish while training but perhaps you have to be as it is a hard course.

Please use this space to add any further comments you have about the mentoring, supervision and teaching of ultrasound students in clinical practice.

MM11   None

MM15   As mentoring is essential in producing experienced sonographers, adequate allocation of time is required for the student to become exposed to all the possibilities of diagnosis, management and treatments available, in the mentor handbook role play scenarios could be given as examples to mentors around questioning of students.

MM16   None

MM18   None

MM19   I think often the students do not realise how hard it is to teach/mentor, we often are only doing our best. Though it is a really hard stressful course so patience is needed all round

Appendix H: Cohen's kappa tables

SM10:

	A	B	C	D	E	Total
A	1	1	0	1	0	3
B	0	2	0	0	0	2
C	0	3	0	3	0	6
D	0	0	0	1	0	1
E	0	0	0	1	1	2
Total	1	6	0	6	1	14

Number of observed agreements: 5 (35.71% of the observations)
Number of agreements expected by chance: 1.6 (11.73% of the observations)

Kappa= 0.272
SE of kappa = 0.115
95% confidence interval: From 0.046 to 0.497
The strength of agreement is considered to be 'fair'.

SM11:

	A	B	C	D	E	Total
A	8	0	0	0	0	8
B	2	2	0	0	0	4
C	1	0	0	0	0	1
D	1	0	0	0	0	1
E	0	0	0	0	0	0
Total	12	2	0	0	0	14

Number of observed agreements: 10 (71.43% of the observations)
Number of agreements expected by chance: 7.4 (53.06% of the observations)

Kappa= 0.391
SE of kappa = 0.203
95% confidence interval: From -0.007 to 0.790
The strength of agreement is considered to be 'fair'.

SM12:

	A	B	C	D	E	Total
A	2	1	0	0	0	3
B	1	1	0	1	1	4
C	0	0	1	0	2	3
D	0	0	0	1	1	2
E	0	0	0	1	1	2
Total	3	2	1	3	5	14

Number of observed agreements: 6 (42.86% of the observations)
Number of agreements expected by chance: 2.6 (18.37% of the observations)

Kappa= 0.300
SE of kappa = 0.156
95% confidence interval: From -0.006 to 0.606
The strength of agreement is considered to be 'fair'.

SM13:

	A	B	C	D	E	Total
A	2	3	0	1	0	6
B	2	0	0	0	0	2
C	0	1	0	1	0	2
D	0	1	0	1	0	2
E	0	0	0	1	1	2
Total	4	5	0	4	1	14

Number of observed agreements: 4 (28.57% of the observations)
Number of agreements expected by chance: 3.1 (22.45% of the observations)

Kappa= 0.079
SE of kappa = 0.157
95% confidence interval: From -0.229 to 0.387
The strength of agreement is considered to be 'poor'.

SM14:

	A	B	C	D	E	Total
A	1	1	0	1	0	3
B	0	4	2	0	0	6
C	0	0	1	1	0	2
D	0	0	1	1	0	2
E	0	1	0	0	0	1
Total	1	6	4	3	0	14

Number of observed agreements: 7 (50.00% of the observations)
Number of agreements expected by chance: 3.8 (27.04% of the observations)

Kappa= 0.315
SE of kappa = 0.165
95% confidence interval: From -0.009 to 0.638
The strength of agreement is considered to be 'fair'.

SM15:

	A	B	C	D	E	Total
A	0	1	0	0	0	1
B	0	2	0	1	0	3
C	0	3	1	1	0	5
D	0	2	1	1	0	4
E	0	1	0	0	0	1
Total	0	9	2	3	0	14

Number of observed agreements: 4 (28.57% of the observations)
Number of agreements expected by chance: 3.5 (25.00% of the observations)

Kappa= 0.048
SE of kappa = 0.139
95% confidence interval: From -0.224 to 0.319
The strength of agreement is considered to be 'poor'.

SM16:

	A	B	C	D	E	Total
A	3	0	1	0	0	4
B	2	4	0	0	0	6
C	0	0	0	1	0	1
D	0	0	0	0	1	1
E	0	0	0	1	1	2
Total	5	4	1	2	2	14

Number of observed agreements: 8 (57.14% of the observations)
Number of agreements expected by chance: 3.6 (26.02% of the observations)

Kappa= 0.421
SE of kappa = 0.155
95% confidence interval: From 0.118 to 0.724
The strength of agreement is considered to be 'moderate'.

SM17:

	A	B	C	D	E	Total
A	4	1	0	0	0	5
B	2	0	0	0	0	2
C	0	1	1	1	0	3
D	0	0	0	1	2	3
E	0	1	0	0	0	1
Total	6	3	1	2	2	14

Number of observed agreements: 6 (42.86% of the observations)
Number of agreements expected by chance: 3.4 (23.98% of the observations)

Kappa= 0.248
SE of kappa = 0.148
95% confidence interval: From -0.042 to 0.538
The strength of agreement is considered to be 'fair'.

SM18:

	A	B	C	D	E	Total
A	2	2	0	0	0	4
B	2	1	0	0	0	3
C	1	0	0	0	2	3
D	0	0	0	0	2	2
E	0	0	0	1	1	2
Total	5	3	0	1	5	14

Number of observed agreements: 4 (28.57% of the observations)
Number of agreements expected by chance: 2.9 (20.92% of the observations)

Kappa= 0.097
SE of kappa = 0.135
95% confidence interval: From -0.168 to 0.361
The strength of agreement is considered to be 'poor'.

SM19:

	A	B	C	D	E	Total
A	0	0	0	0	0	0
B	1	2	0	0	0	3
C	1	0	3	0	0	4
D	0	2	4	0	0	6
E	0	1	0	0	0	1
Total	2	5	7	0	0	14

Number of observed agreements: 5 (35.71% of the observations)
Number of agreements expected by chance: 3.1 (21.94% of the observations)

Kappa= 0.176
SE of kappa = 0.112
95% confidence interval: From -0.044 to 0.396
The strength of agreement is considered to be 'poor'.

SM20

	A	B	C	D	E	Total
A	0	2	1	0	0	3
B	0	5	0	0	0	5
C	0	0	1	1	0	2
D	0	1	0	1	0	2
E	0	0	1	1	0	2
Total	0	8	3	3	0	14

Number of observed agreements: 7 (50.00% of the observations)
Number of agreements expected by chance: 3.7 (26.53% of the observations)

Kappa= 0.319
SE of kappa = 0.134
95% confidence interval: From 0.056 to 0.583
The strength of agreement is considered to be 'fair'.

OVERALL:

	A	B	C	D	E	Total
A	23	11	3	3	0	40
B	12	23	2	2	1	40
C	3	8	8	9	4	32
D	1	6	6	7	6	26
E	0	4	1	6	5	16
Total	39	52	20	27	16	154

Number of observed agreements: 66 (42.86% of the observations)
Number of agreements expected by chance: 34.0 (22.09% of the observations)

Kappa= 0.267
SE of kappa = 0.049
95% confidence interval: From 0.170 to 0.364
The strength of agreement is considered to be 'fair'.

Appendix I: 2016 Cohort activities

Table 1

Mentors perspective		
What is expected from the mentor?		
Personal support	Functional or Academic	Practical issues
Caring	**Aware expectations**	**Approachable**
Disciplined	Commitment	Encouragement
Empathy	**Feedback**	Engagement
Motivated	**Guidance**	Friendship
Non-judgemental	**Knowledgeable**	Leadership
Patience	**Learning**	Positivity
Reliable	Set an example	
	Spoon feeding	
	Support	
	Teaching	
	Us to take responsibility	
	Us to take blame	

Table 2

Student perspective		
What is expected from the mentor?		
Personal support	Functional or Academic	Practical issues
Flexibility	Arrange clinical training hours	**Approachable**
Patience	**Clear objectives and expectations**	Available
Support	Continuously assess progress	Likes **teaching**
Understanding	Critical evaluation	
	Ensure correct training	
	Equipment teaching	

Feedback – positive and negative

Guidance

Have good clinical skills

Help achieve learning needs

Help keep us on track

Help organise and set goals

Help to understand the process

Help with directed learning

Help with report writing

Help with study time

Letting us get hands on scanning

Link theory to clinical practice

Mock assessments

Planning assessments

Realistic expectations of practice and learning

Sharing of **knowledge**

Should be experienced

Sign off as competent

Supervision

Teaching

Table 3

Mentors perspective		
What is expected from the student?		
Personal support	Functional or Academic	Practical issues
Caring	Accept **guidance**	**Communication**

	Ask questions	**Dedication**
	Learning	**Enthusiasm**
	Set goals	**Honesty**
	Take on board feedback	Initiative
		Interested
		Positive Attitude
		Preparation
		Professionalism
		Punctuality
		Recognise boundaries
		Reliability
		Respectful
		Responsibility
		Responsible for learning
		Team working

Table 4

Students perspective		
What is expected from the student?		
Personal support	Functional or Academic	Practical issues
Be engaged	**Academic learning**	Adaptable
Dedication	**Agree learning goals**	Attendance
Enthusiastic	Come to them with academic / work issues	Extra study days / CPD
Focused		**Good communication**
Good attitude	**Do homework**	Organised
Honesty	Make cups of tea	**Prepared**

Motivated	**Realistic goals**	**Proactive disciplined learning**
	Seek support and **guidance**	Professional relationships
	Self-awareness of limitations at each stage	**Professionalism**
	To be open to constructive feedback	**Punctuality**
		Reliable
		Self-motivated
		Show initiative
		Show interest
		Team building
		To put effort in
		Willing to learn