'So, What Are We Looking at Here?' -

Research, its Position and Pedagogy in the UK Radiography Profession

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Abstract

Context

As a diagnostic radiographer, educator, and researcher, the focus of my study is research pedagogy in radiography and the importance of research for our profession. I explored how current practice in one educational setting endeavours to realise the aims of The Society and College of Radiographers *Research Strategy 2016-2021* around embedding research in the curriculum, from the perspective of educators and radiography students.

Method

Searching for a research method in harmony with my position within the interpretivist paradigm, while acknowledging my entanglement within the research as a co-constructor with my participants and also mindful of the voices of individuals, I developed Co-Constructed Depiction as an innovative use of imagery in both data collection, analysis and presentation of results. This new method is symbolic of, and congruent with, the practices of the radiography profession since it maintains the importance of images, their interpretation, and use in my research. Participants, who were radiography staff, post-graduate radiography and ultrasound students and 3rd year radiography undergraduate students, took part in individual semi-structured interviews that included participant image making. Information gathered was reported as a pictorial and written depiction and analysis, in an echo of our professional work of image making and reporting. Using a Bourdieusian lens, I looked at the concept of habitus for radiographers and explored replacing the concept of 'profession' with that of 'field', looking through the data for patterns and noted the *puncta*- that which struck me as important.

Results

I developed Bourdieu's work on symbolic capital to propose a new concept of 'symbolic research capital' to explain the importance of a spectrum of research activity for a profession. The results show that radiography students and educators do see the

importance of research for individuals and the profession, but they identify many constraints to teaching and learning. There are however many suggestions for improvements, some of which have already had an impact on my teaching. While students were able to identify places where research was embedded in the curriculum, staff did not feel embedding was done well, if at all.

Conclusion and Recommendations

The findings will inform future research pedagogy and curriculum development in radiography around embedding research in the curriculum in a way that educators and students recognise. A greater awareness of the importance of research and ‘symbolic research capital’ for radiographers will lead to them being better prepared to take on advanced practice roles for the benefit of patients. My ongoing aim is to make clear to students how important research is for them, their profession and most importantly, for our patients rather than, as one participant described it, ‘a hoop to jump through’ on the way to qualification.

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List of Key Abbreviations

CCD- Co-Constructed Depiction

COR- College of Radiographers

CPD- Continual Professional Development

CPSM- Council for Professions Supplementary to Medicine

CT- Computerised Tomography

DCR- Diploma of the College of Radiographers

HCPC- Health and Care Professions Council

HEI- Higher Education Institution

MRI- Magnetic resonance imaging

MS PPT- Microsoft PowerPoint

NHS- National Health Service

OED- Oxford English Dictionary

RCR- Royal College of Radiologists

REF- Research Excellence Framework

SA- Situational Analysis

SCoR- Society and College of Radiographers

SOR- Society of Radiographers

UK- United Kingdom

Chapter 1 Introduction to me and my study

1.1 #Hellomynameis Louise

When the late Dr. Kate Granger was undergoing treatment for cancer, she noticed how few of her carers introduced themselves. She and her husband started the #Hellomynameis campaign to encourage healthcare staff to remember to introduce themselves not just as a courtesy, but to help make human connections between patients and staff (Granger, n.d.). So, in the personification of this campaign where connection through introduction is key, I wish to introduce myself: #Hellomynameis Louise. I am a diagnostic radiographer, educator, and researcher all three simultaneously, echoing the condition of Schrödinger's cat 'mixed or smeared out in equal parts' perhaps (Trimmer, 1980: 8). I work in a university to which I refer as 'Midlands University' throughout this thesis, to avoid naming it directly with possible consequences for the anonymity of my participants. As a radiographer images are an important and integral part of my practice, both clinically and academically and I follow this theme of images through my research by collecting data using participant created drawings and words and presenting the results as a depiction of images and words.

1.2 Context of the study

There are two strands to radiography, one being therapeutic radiographers who mainly treat cancer with radiation while making use of medical images to plan treatments, and also diagnostic radiographers, like me, who produce diagnostic medical images of patients using a variety of technologies such as x-ray equipment which use radiation on the electromagnetic spectrum, ultrasound scanning and magnetic resonance imaging. In the UK, the professional body of radiographers is known as The Society and College of Radiographers (SCoR) which is divided into two parts, the first being the Society of Radiographers (SOR) which is the trade union and professional body for the UK radiography workforce. Meanwhile the College of Radiographers (COR) is a charitable body focussing on benefits for the public, research and education. Many publications are made by each branch

separately, and some under the umbrella of the SCoR. While the abbreviations used throughout this thesis are not interchangeable since they reflect the exact source of publications cited, they all refer to the body having overview of professional and educational matters for radiography in the UK. The Health and Care Professions Council (HCPC) is a statutory regulator with whom radiographers must be registered to be able to practise in the UK.

The radiography profession has a four-tier career framework (Society of Radiographers, 2013) encompassing four levels. In ascending order these are: assistant practitioners, practitioners who are state registered, advanced practitioners and finally consultant practitioners. Radiographers attaining these last two levels work in specialised areas of practice and usually require further education at Master's or Doctoral level to enable them to incorporate the 'four pillars' of advanced practice, these being: clinical practice, leadership and management, education, and research into their practice (Health Education England, 2017).

The research pillar is of most interest to me in this study due to my personal engagement in research and a desire to improve my practice as a radiography educator currently teaching research in a higher education institution (HEI). For me, the term 'research' encompasses a range of activity from creating new knowledge to reading, understanding and using that knowledge in practice. This aligns with the aims of the Society and College of Radiographers (2015a) *Research Strategy 2016-2021*, as their recommendations similarly include a spectrum of research activity which should be embedded in radiography practice and education.

When considering where research may already be embedded in the curriculum at Midlands University there are two modules that can be perceived to be overtly research related. One is the Evidence Based Practice module, during which students learn about making decisions in practice, based on the best evidence available. The emphasis is on searching for and

critically evaluating existing research and evidence on professionally relevant topics and how research evidence, patient preferences, clinical expertise and resources are used together to inform practice (Hafslund et al. 2008). Students are also introduced at this stage to data analysis techniques. Building on this base, my teaching in their third year Research Module helps students to plan and write their own research project (collecting and analysing original data) or proposal (data analysis demonstrated using data created by the student). While there are some keynote lectures and in-class practical activities, the majority of the learning in this module occurs when students develop and write up their project or proposal under the supervision of staff in the radiography department. This means students are able to engage in research in a practical way, from reading and critiquing literature, to designing a proposal and having a go at analysing data. My aim is to encourage more students to do a research project in future, in other words practising research for themselves as a practical activity. I discuss reasons why research is important for the profession, and thus a necessary part of radiographer education later, in Chapter 2 (starting on page 11).

When preparing a patient for medical imaging, the radiographer will ensure that the 'area of interest', that is, the part of the patient to be imaged, is correctly identified and positioned in relation to the imaging technology being used. My area of interest in this study is research and research pedagogy in radiography. This study aims to investigate current and historical contexts to understand the position and importance of research within the radiography profession and to investigate and evaluate issues around embedding research in the radiography curriculum in the higher education setting where I work. This understanding contextualises research in a relatively new profession and will inform future research pedagogy and curriculum development in radiography. All HEIs can draw on my work to help address the challenges identified by the Society and College of Radiographers (2015a) *Research Strategy 2016-2021.* Lecturers and students of radiography, both therapeutic and diagnostic, including undergraduate and postgraduate students currently employed by or studying at the post 1992 Midlands University participated in the research. They were invited

to share their opinions and beliefs during interviews that included dialogue and image making in the new data collection and analysis method I have developed.

1.3 Defining my area of interest

This study addresses issues raised by the latest five-year plan *Research Strategy 2016-2021* (Society and College of Radiographers, 2015a) published by the SCoR. This is the latest of a series of documents supporting the evolving discourse on research in the profession including Gambling et al. (2003), Reeves et al. (2004), Probst et al. (2011) and Reid & Edwards (2011).

The document from the SCoR above has three key aims, namely:

1. Embed research at all levels of radiography practice and education

2. Raise the impact and profile of radiography through high quality research focussed on improving patient care and/or service delivery

3. Expand UK radiography research capacity through development of skilled and motivated research-active members of the profession (Society and College of Radiographers, 2015a: 4).

Each of these aims is short and clear and accompanied by a list of recommendations for actions required to achieve each aim. These action points identify *who* in the profession should be responsible for the implementation of each recommendation, however there is no guidance regarding *how* these aims are to be achieved, this being left to the discretion of the agents responsible for effecting them.

The expectation of this vision statement is that embedding research, particularly in education as explored in this study, will raise the professional standing of radiography by increasing the amount and quality of research undertaken. What is perhaps not evident enough in these statements is that the profession does research for the benefit of patients, as the emphasis is on raising the profile of the profession and research capacity. I feel however that the

benefit to patients is at the heart of this vision but is dependent on promoting the profession of radiography. This research explores radiographers' and students' understanding of this apparent interdependence. While investigating the value of practitioner research for the benefit of patients in practice, this research will explore the equally important value of research as a form of symbolic capital (Bourdieu and Wacquant, 1992), an expression explicated in the next chapter, for the profession of radiography and its implications for the future of radiographer education.

The SCoR (2015a) *Research Strategy* document regularly uses the word 'embed' when discussing research. The *Oxford English Dictionary* (OED) (2016) defines embed as 'to fix firmly in a surrounding mass of some material', however in the context of research in the curriculum a better definition may be one of the alternatives given by OED (2016): 'implant (an idea or feeling) so that it becomes ingrained within a particular context'. This definition supports the intention that research should be an integral part of teaching, learning and professional practice in radiography. This study therefore identifies how current practice in Midlands University endeavours to realise the aims of embedding research with reference to those action points identified by the SCoR as the responsibility of HEIs. Drawing on the experiences of radiography educators and students, any improvements and changes suggested could be integrated into research teaching in radiography in order to fulfil these obligations. Enquiry into the current and historical influences on radiography research positions research within the profession and exposes problematic or constraining influences on the teaching and practice of research by the profession. I intend this new knowledge to lead to future policy recommendations and curriculum evolution in the short term, and in line with the SCoR policy, increased levels of research in the radiography profession in the long term. In the radiography profession, my findings contribute to the understanding of research and radiography and in a wider context to the debate on professions, particularly emergent ones within health care, and their boundaries**.**

To summarise, this study aims to understand the importance of research for a profession, and to make a response to the SCoR (2015a) *Research Strategy* document by understanding the importance of radiography research in context and its location embedded in the radiography curriculum in Midlands University. This knowledge can be used to enthuse, educate and enable students, educators, and radiography practitioners by communicating the clearly articulated position of research in the profession.

1.4 My entangled position within the research study

I approached the Professional Doctorate training with a positivist ontology, based on years of cultivating a scientific outlook. This started during my school education when I focussed on science subjects and continued through my training and practice as a radiographer; a profession based on science, in particular physics, and positioned within the medical field. As a new doctoral student, with a positivist ontology, I believed that the only way to do 'real' research was to measure something, make a change and then measure again to see the difference, in other words experimental designs collecting numbers for analysis. However, being exposed to new ideas and philosophies, for example my readings and group discussions of the work of Lyotard (1984), Lather (2006), Barad (2007) and Howell (2013), I have developed my thinking towards an interpretivist paradigm. I now believe that shared understandings of the world, known as social constructionism (Howell 2013), are as important as direct measurements of it, and that some things cannot be 'measured' only an attempt made to understand them.

Howell (2013) describes social constructionism as a paradigm in which an understanding of reality is based on social interaction and while, according to Crotty (1998) there is no true or valid interpretation of the world, it is possible to come to useful interpretations. How people make sense of their world is influenced by other people- the social constructionism, and also by nonhuman material aspects such as technology and visual representations, in other words the nonhuman matter that matters to us (Barad, 2007; Clarke et al., 2017). A constructionist epistemology assumes that everyone involved in my study has their own

perspective on the research questions asked, so my interpretation of what I am investigating will be built by discovering what these individual views are (Creswell and Poth, 2018), indicating the use of an interpretive method of data gathering and analysis, simultaneously acknowledging the entangled presence of me as the researcher. Barad (2007) suggests that we are entangled with both human and nonhuman phenomena, meaning that everything we try to measure is dependent on what we measure and how we measure it. For me this means that I have come to accept that I am entangled within my research because I am making these measuring decisions. Therefore, a qualitative approach will provide the overarching framework within which this study will be conducted, drawing inspiration for my use of images and interviews for data collection and their analysis from my practice, from Clarke et al. (2017) who discuss using grounded theory after the postmodern/interpretivist turn and from Riessman's (2007) work on narrative enquiry, to develop a new method of data collection and analysis: 'Co-Constructed Depiction'.

In diagnostic radiography, a radiographer produces an image of a patient. The reporter, who is often a different person to the radiographer by whom the image was made, will later view the image and may see an abnormality which, based on their previous experience and training, they are able to identify as a pathology. Because the reporter is basing their diagnosis on their own previous experience and knowledge while looking at a representation of the pathology, there is room for error. The wording of imaging reports often reflects this uncertainty, as the phrases: 'gives the appearance of' or 'appears to be' are frequently used since a more accurate description of the abnormality cannot be given until further investigations are made, for example by biopsy of what appears to be a tumour. It is possible for the reporter to make an incorrect or partial diagnosis, and I appreciate that as the sole interpreter of the data in this research, any analysis will be from my own perspective, and will not be definitive or infallible. However, just as all diagnostic medical images must be reported on (The Royal College of Radiologists, 2006), some interpretation of my data is necessary as individuals' collected data do not speak for themselves.

1.5 Defining my focus- the research questions

There are three research questions to be answered by this research all of which are related to research pedagogy in radiography. The first research question asks:

> Why is a research base important for the radiography profession?

The aim of this question is to understand the position and importance of research from the perspective of a relatively new profession, drawing on previous literature and the responses of my participants. I use Bourdieu's concepts of 'habitus', the replacement of the concept of 'profession' with that of 'field' with borders around it, and of 'symbolic capital' to explore these ideas, all of which are further explained in the next chapter (Bourdieu, 1977; 1986; Bourdieu and Wacquant, 1992).

The second research question asks:

> What are the perceived influences on radiography educators in their endeavours to teach research in the radiography curriculum, from both educators' and students' perspectives?

I want to find out what both educators and students think influences how we teach research to radiographers, from their perspectives, including both human and nonhuman elements (Barad, 2007).

The third question asks:

> How is embedding of research in the radiography curriculum at Midlands University perceived, from both educators' and students' perspectives?

The aim of my third question is for me to gain an understanding about whether educators and students are aware of research embedded in the Midlands University curriculum, and what form that takes for them.

1.6 Structure of my thesis

So far in this chapter I have explained that my aim throughout this research is to answer the questions posed using an appropriate methodology and new method of data collection and

analysis that maintain the importance of images, their interpretation, and their use in a reflection of the practices of the radiography profession. As a radiographer and educator currently teaching research, I aim to understand from other radiography educators and students what they feel are the influences and constraints on teaching research, and to gain a better understanding of how we embed research in our teaching and curriculum. Based on my understanding of the situation I will use this knowledge to make any changes needed to our teaching, with the long-term aim of improving the quality and quantity of research output in the radiography profession. Informing these aims is the desire to have a better understanding of the current position of research in radiography by evaluating important historical and current influences that inform the drive within this 'new' profession to make research fundamental to its identity.

In Chapter 2, I introduce contextual literature and explain how I have used a Bourdieusian lens to explore the research themes and background. I explore further how Barad's (2007) concept of entanglement helps develop thinking around professional practice in radiography. I show how Barthes (Barthes, 1978: 1982) has helped me develop a new method of data collection and analysis which is expanded on in the following chapter. Chapter 3 discusses the processes by which I arrived at an appropriate method for data collection and analysis, drawing on narrative and visual methods. Data gathered were analysed and presented together in a new method I have created called Co-Constructed Depiction. Chapter 4 contains images and reports that form the description and analysis phases of my research. Finally, Chapter 5 offers a conclusion of my findings with relation to the research questions I ask, and my recommendations, with a note of limitations of the project. The chapter ends with a presentation of the contribution of my work to the field.

1.7 Conclusion

This study aims to explore and evaluate issues around embedding research in the radiography curriculum in one HEI, to lay a foundation in understanding the position and

importance of research within the profession and proposes reasons why research is important for a relatively new profession.

This understanding helps explain the place of research in an emerging profession and to inform future research pedagogy and curriculum development in radiography, offering ideas to all HEIs to address the problems identified by the SCoR (2015a) *Research Strategy 2016-2021*. Participants include radiography lecturers and students of radiography, both therapy and diagnostic, at all levels from Undergraduate Degree to Doctoral student level currently employed by or studying at a post 1992 Midlands university. In the radiography profession, the findings will contribute to the understanding of research and radiography and in a wider context to the debate on professions, particularly emergent ones, and their boundaries**.**

Chapter 2 Introducing radiography to Bourdieu

This chapter has several main sections. In the first section I give an overview of some of Bourdieu's main concepts: habitus, field and capital, which I use throughout the thesis to help explore and explain the links between radiography, radiographers and research. Each concept and the way I use them is explained through this chapter. The second section positions radiography within the context of contemporary health care professions from its beginnings in the early twentieth century to the present day, with an emphasis on the development of the education of radiographers and how research is incorporated into teaching. The third section discusses the relationship between radiographers, technology and patients, drawing on Bourdieu and Barad. The fourth section uses Bourdieu's field theory to explore professional status and boundary work (Bourdieu and Wacquant, 1992) in the context of radiography, followed by a section introducing what I am calling 'symbolic research capital'. Research in a health care profession has patients as its focus so this concept is further explored in the next section, with a discussion of the impact on patients of the radiographer's dual roles of technology users and patient carer, and the practical role of research in clinical practice. Following a discussion of influences and constraints in research in clinical practice, the chapter closes with a section about Barthes, and how his ideas helped me think about images and their interpretation.

To conclude this introduction, I would like to briefly explain my literature search strategy. To identify relevant literature, I conducted searches on the British Education Index, Summon, ERIC, CINHAL and Google Scholar, using the search terms student, research, investigation, radiography, radiographers, health, teaching, pedagogy, curriculum, university, research methods, profession and professional identity. Once I had chosen to use the theoretical work of Bourdieu, Barad and Barthes, I conducted further searches using their names and the terms above as well as habitus, field, capital, borders, boundaries, entangled, images, medical, and radiology. In addition, the 'snowball' method was useful for locating further relevant material from the reference lists of the papers and books found in these searches,

in particular leading to unpublished theses which revealed other sources of information not found in previous searches on databases. I did not delimit the search by date or by language, although in practice I only used literature which had been written in or translated into English. To demonstrate the profession's 'symbolic research capital' I drew on and cited literature produced by radiographers wherever possible.

2.1 Introducing Bourdieu

Bourdieu suggests that theory should be used to aid understanding and solve problems rather than as theory for its own sake; a position which sits well with practitioner research such as this project where I depict problems, perceptions, and solutions regarding research pedagogy in radiography from my position as a radiography lecturer and researcher. I was introduced to Bourdieu as one of the theorists we discussed during the first part of the doctoral training. What attracted me to his ideas was how they could help me think about radiographers, profession and research in an interlinked way. For example, the concept of habitus, as the embodiment of values and dispositions within an individual, corresponds with the experiences of and attitudes of radiographers towards research, which I wanted to understand. My development of one part of the concept of symbolic capital into 'symbolic research capital' and the use of Bourdieu's replacement of the concept of 'profession' with that of 'field' led me through the practical issues I faced when evaluating whether or not radiography is a profession or not (Bourdieu and Wacquant, 1992). My conclusion, based on my argument through this chapter, is that radiography is indeed a profession. Each of Bourdieu's concepts, habitus, field and symbolic capital and how I used them are explained in further depth through this chapter.

2.2 Introducing radiography: The historical context of the radiography profession from 1895

As Bourdieu (1992) suggests, it is important to outline the historical background of a field to understand the dynamics and structure within the field. This section gives an understanding

of the background to the radiography profession, explaining the implications to the profession of its fairly recent addition to health care before using Bourdieu to think further.

The late nineteenth and early twentieth century saw the emergence of several health care groups as professions in Europe and North America distinct from, but dominated by, medicine (Freidson, 1988). For example, in Great Britain occupational therapy and physiotherapy became distinct groups in the late nineteenth century (Larkin, 1983), with physiotherapy setting professional examinations and rules for professional conduct in 1895. Midwives first became a registered profession in 1902 with nurses following soon after in 1919 (Freidson, 1988). Social work became one professional association later in 1970 from several separate professions (Davis, 2008).

Meanwhile in Germany, Roentgen had first discovered and reported X-rays in 1895 and their use in diagnostic medical imaging was recognised by the following year (Larkin, 1978) while cancer treatment using the newly discovered rays began in 1900 (Sutton, 2014). By 1910 in the UK, a combined practical and theoretical training for radiographers was in place. The inception of the UK profession of radiography, as a separate group of health care workers, occurred soon after in 1922 when the first radiographers qualified under the SOR aegis (Bentley, 2004). Sutton (2014) suggests that this is when radiography became a separate profession, distinct from medical doctors, due to the technical nature of the work undertaken. At this time, the two branches of radiography started to become distinct from each other, diagnostic radiography concentrating on using imaging to aid diagnosis of disease, while in radiotherapy x-rays were used to treat disease. So, following the chance discovery of x-rays around the time of the development and professionalisation of other professions allied to medicine, radiography was ready at the same time as these other groups to be recognised as a profession.

The Society of Radiographers was founded, ironically in light of future professional boundary issues that I discuss later in Section 2.4.2 (starting on page 31), by two radiologists (medical

doctors) in 1920. Bentley (2004), in his examination of the archives of the SCoR presents an insight from a meeting in 1935 which shows that the professional status of radiographers was already under consideration when it was suggested that if a candidate wanted to sit the Membership examination, they should have been educated at a recognised teaching centre. There is no explanation of how this training would raise the radiographers' status, but the suggestion is that radiographers should have a recognised practical training for a vocational occupation rather than just the ability to pass an examination, which is still true in current radiographer education. Moodie (1970) suggests that examination was necessary to maintain high standards of professional knowledge since by 1929 the adverse side effects of x-rays were becoming known. Further the SOR suggested that 'the quality of a radiographer was implicit in his [*sic*] qualification' (Moodie, 1970: 17), making clear the need for radiographers to possess a body of knowledge before practising. This dual aspect of training, both academic and practical vocational skills with similar weighting on the importance of each was present at the inception of the radiographer 'habitus' and is still a consideration when developing curricula for radiography degrees.

2.3 Using Bourdieu's concept of habitus to explore the embodiment of *radiographer*

In radiography, reference is sometimes made to the patient's bodily habitus in reports, for example McKiernan (2010) and Schneider (2013) with reference to ultrasound scanning, while Woods (2015) and Beck (2015) discuss bodily habitus and plain film radiography. Plain film radiography refers to the oldest and most common type of medical imaging, for example a set of images used for diagnosing injury to bone, or single image chest x-ray. In the context of imaging, habitus refers to the physique or body-build and is often used negatively, as in these papers and other examples, to denote obesity in a patient and a resultant loss of detail within the images.

However, for Bourdieu, habitus is an embodiment of the values and dispositions within an individual, and not only the physical appearances as radiographers understand the term. Bourdieu describes habitus as:

> …an acquired system of generative schemes objectively adjusted to the particular conditions in which it is constituted. (Bourdieu, 1977: 95).

This means a person's habitus is formed by the influences on them and Wacquant, who worked closely with Bourdieu, suggests there is a primary habitus shaped in childhood, and a secondary habitus shaped by 'the specialized pedagogical labor [*sic*] of the school and other didactic institutions' (Wacquant, 2016: 5), of which Midlands University is one example.

Many writers in education have used Bourdieu's idea of habitus, but as a radiographer educator, my interest is in how his concepts have been used in research into the education of healthcare professionals, of which there are a few examples. Some writers use the idea of habitus as a descriptor for characteristics and roles, such as Morberg et al. (2012) who studied school nurses in Sweden. However, in this study they did not consider how habitus had changed during training, only how it had developed in already qualified nurses. Hayes (2013) did consider how the habitus of nurses is shaped by their education, claiming that she was the first to use Bourdieu's theories in this way in the profession of nursing. Hayes suggests that the habitus of nurses in general has changed because of their education transferring to degree level qualifications within Higher Education. As radiography education similarly moved from hospital-based schools to Higher Education, although slightly earlier than nursing, it may be expected that radiographers' habitus has undergone similar changes. These include, according to Hayes, changes in the skills learned by nurses to enable extended roles, an opportunity which has also been afforded to radiographers.

Following Wacquant's (2016) and Hayes's (2013) suggestions that habitus is changed by education, a radiography student's secondary habitus is shaped by the academic education and practical training which gradually modifies their habitus, from lay-person on arrival at the university, into that of a radiographer. During their education, students will take on aspects of a radiographer habitus, which in practical terms means successful students become competent to pass assessments and also become clinically skilled, so they can be state registered as a radiographer, a requisite for professional practice. Hence, education could be

seen as the cultural production of *radiographer habitus* in individuals, allowing them to 'swim like a fish in water' (Bourdieu and Wacquant, 1992: 127) once qualified. My interpretation of the SCoR *Research Strategy* (2016-2021) through the lens of habitus is that by embedding research in student education, research practice should become embodied within radiographers' habitus and part of the doxa, the 'second nature' or 'taken for granted' in radiography practice. My research aims to gain an understanding of how research fits in to both students' and lecturers' habitus and how well we are embedding research in the curriculum with the ultimate aim of improving patient care and experience.

2.3.1 Physical embodiment of habitus: Technological habitus entangled with patient care

Thus far in this chapter I have discussed how for radiographers, one purpose of vocational degree professional training is to enable a student to take on the habitus of a radiographer, able to play their part in the field as a health care professional. However, radiography as a profession could not exist before the discovery of x-rays and the technological advances that made it possible to develop the equipment needed to harness their uses, so a radiographer cannot practise without the necessary technology to support their role.

Another way to conceptualise changing habitus during their education is to suggest that the students become the embodiment of 'radiographer actions', as well as thoughts. For example, the particular way an examination is performed is learned as a practical skill and enacted in similar ways by different radiographers. The practice of performing radiographic imaging examinations is dependent on technology and equipment since without them the radiographer and patient alone cannot make diagnostic medical images. Freund (2004) draws on Bourdieu's concept of habitus to propose the 'technological habitus', as being 'an internalised form of control that allows individuals to function in a "technological" society' (Freund, 2004: 273). Freund also draws on what Haraway (1991) calls cyborg relationships to suggest that 'Everyday life in a "technological" society demands that humans and machines mesh into cyborg-like relationships' (Freund, 2004: 276). Freund then uses the

analogy of car driving, while Czaja (2011) similarly discusses technology such as mobile telephones to explore an enmeshed, or in Barad's (2007) term, entangled, relationship between human and technology.

Barad draws on her background as a physicist to theorise on the interactions between humans and nonhumans, or as she calls it matter. She suggests that matter, meaning the nonhuman, becomes 'an active participant in the world's becoming' (Barad, 2003: 803); in other words she says, 'matter matters' (Barad, 2003: 803) and the nonhuman has agency in the moment it interacts with humans. Barad (2003) says:

> Agency is not an attribute whatsoever—it is 'doing'/'being' *in its intra-activity*. (my emphasis) (Barad, 2003: 827).

This concept of entangled relationship can be extended to that between radiographers and imaging technology. The imaging machines become not only a tool to work with, but also part of the technological habitus of the radiographer due to humans' dependence on the technology needed to perform their role. Using these arguments, radiographers become cyborg-like, as the radiographer and technology become co-dependent. At the very moment the radiographer chooses to 'press the button', x-rays are produced and then computers manipulate the data collected to produce images almost instantly, but both human and machine are entangled, human and nonhuman, with each other in this moment. In Bourdieusian terms, this close, indeed essential, relationship becomes part of the doxa, or 'taken for granted' (Bourdieu, 1977: 164) of practising as a radiographer, which students learn from the start of their training.

This is not a new phenomenon in radiography though and is what Latour describes as black boxing, saying:

> …the way scientific and technical work is made invisible by its own success. When a machine runs efficiently, when a matter of fact is settled, one need focus only on its inputs and outputs and not on its internal complexity. Thus, paradoxically, the more science and technology succeed, the more opaque and obscure they become (Latour, 1999: 304).

Pasveer (1989) in an historical overview of medical imaging, identified the term being used to illustrate the change in content of publications about imaging. At first, the technology was given similar weighting in publications to the product of the technology, the images. However, as the equipment improved, and x-rays became an accepted part of medical diagnosis in the early twentieth century, discussion about how the technology worked became less interesting than its product, so becoming hidden in a metaphorical black box.

However, while the machines may be part of radiographers' 'technological habitus' there is more involved in imaging than just the radiographer and the machine, as the objective is to produce an image of part of another human. The entangled relationship between radiographer and technology becomes partially ruptured and reconstituted by the presence of the patient. The paradox between the skilled use of technology and patient care in a radiographer's work was noted by Murphy (2006), suggesting that the radiographer acts as a bridge between the two by avoiding objectification of the patient. Similarly, a phenomenological study by Bolderston et al. (2010) into the perceptions of the equivalent of therapeutic radiographers in Canada found three themes. These were the human connection between the professionals and their patients, secondly technical care, and thirdly the technology-using radiographer professionals' unique identities compared to other professionals. These findings suggest that radiographers are aware of the way their role encompasses both patient care and technology. I agree with Bolderston's (2010) suggestion that individuals within the therapeutic radiography profession have evolved to utilise new technology, and I believe this is true also for diagnostic radiographers. However, the other part of radiographers' roles is patient care, and without social interactions, radiographers cannot practise effectively, since the patient needs to be positioned correctly for their examination, as well as cared for as a person.

In contrast with Bolderston's view, Burri and Dumit (2008) who are writers in science and technology, omit the patient in their discussion of diagnostic imaging, mentioning only how and by whom images are made and used. Similarly, Burri (2008) discusses boundary work

in radiology in terms of the control of new technology, which was identified in Bourdieusian terms as symbolic capital, and the ability of those in the medical imaging field to report on images. Again, the patient, as a body being imaged and as a person for whom care is provided, is omitted from the discussion. However, in medical imaging the patient's body is integral, entangled as it is with the technology and the radiographer. For radiographers the recognition of the patient as a person is as important as the depersonalised body presented as a product of the imaging process. This dual aspect of radiography offers opportunities for both qualitative and quantitative research to add to the professional body of knowledge.

2.3.2 The conflicted radiographer habitus: 'Hit the floor running' versus 'Hit the floor thinking'

Teaching students on a vocational degree such as radiography can lead to tensions between the need to enable students to be ready for practice on qualification, and building the skills needed to foster the future of lifelong learning, particularly in postgraduate education which may in turn lead to an increase in research output as anticipated by the SCoR (2015a). Findlow's (2012) study of nurse education similarly identifies a dichotomy between training students for a practical job and improving their education skills, which is reflected in radiography training. For example, Payne & Nixon (2001), when describing the type of newly qualified radiographer required by clinical departments used the phrase 'hits the floor running'. This expression is used to describe newly qualified radiographers being ready to work clinically in an imaging department as a fully competent member of staff from the day they start, with little time to acclimatise themselves to the environment. Later Jackson (2013) used the same phrase in his study of the UK radiography curriculum where he identified a disparity between the radiography community and educators in their identification of the significance of research as a skill vital for radiographers. Jackson's (2013) findings confirm that there is a lack of awareness of the research culture within the workforce in accord with the SCoR, which may be addressed by improving research teaching at undergraduate level, so radiographers enter the professional field equipped for

and confident to perform research. In other words, ready to ‘hit the floor running and thinking’ and with the ability, based on their education, to progress both their embodied practical skills and intellectual skills into advanced practice.

Some of the skills associated with the practice of research are critical thinking and writing, both of which can be taught to students. Since research is of little value without dissemination, writing skills are essential for researchers and by implication all radiographers. Castle (2010) suggests radiography students can practise their critical thinking and analysis skills using a health-based exercise and worked example as an in-class exercise or an assignment. Unfortunately, he does not give any evaluation of this method in practice. Drago (2007), an American radiography educator, identifies the importance of writing skills for radiographers as students and as they progress through their education and careers, suggesting that writing needs to be embedded in the curriculum. Several practical exercises are suggested which can be used to help students at all stages of their training although again there is no evaluation of their effectiveness. Once students qualify as radiographers there is little need to engage with research or writing in the clinical setting, so although these will be useful skills for postgraduate research, unless radiographers engage in Continuing Professional Development (CPD) these skills may not be maintained and so lost from their embodied habitus. Part of the academic educators’ role may be to reconcile the need for clinical ready entry-level radiographers integrating patients and technology in their practice, with the needs of a health care service pursuing evidence-based practice, and of radiography in positioning itself as a profession. This research will explore ways in which educators approach these potential problems.

Radiography is not the only health profession to have undergone changes in education as degree courses in all professions allied to medicine and nursing have become more academic and university based. This change in emphasis on the academic component of education may have had an adverse effect on the integration of the practical nature and training for the job of radiography. For example, Baird (1996) writing only four years after

radiography became a graduate entry profession, discusses the difficulties for students in matching practice in the clinical setting, the practicum, with knowledge learned in the university. Baird continues that technical ability needs to be complemented by critical thinking skills, implying that a professional radiographer needs both types of skill. However, she suggests that most professional undergraduate programmes' practicum focussed on the technical learning or how to *do* the job, at the expense of academia, which includes research and critique or how to *think* about the job. Baird's proposed solution to bridge this perceived gap is to include more reflection in practice. In other words, students need to develop their skills to think critically about what they are doing in practice rather than becoming technicians, sticking to the 'unambiguous implementation of rigid rules and procedures' (Baird, 1996: 172). Writing later, McInerney and Baird (2016) state that, in accord with professional registration bodies' requirements, critical thinking is essential for radiographers. They suggest integrating critical thinking into the whole curriculum and discuss their analysis of three learning activities. They acknowledge the limitations of their small-scale research and that while their study assessed pedagogical tools from a students' perspectives, there is no guarantee that it will translate into an increase in critical skills in practice. However, this study matches with my argument that students need to study research in the curriculum to help develop their critical thinking with the expectation that it will lead to an increase in criticality in practice. If we do not teach these skills, there is a reduced prospect of them being available to students, as part of their habitus, once qualified and in practice.

Hammick (1995) also writing soon after the move to degree education for radiographers, suggested that there may be resistance from members of the profession to the introduction of research into the curriculum and practicum, particularly among radiography managers who questioned what might be lost from the curriculum in order to add research to it. Similarly, Jackson (2013) made a study of a current UK radiography curriculum and agrees that there should be some research training within the undergraduate curriculum but his participants from within the wider radiography community did not clearly identify research as

a skill or knowledge vital to the radiographer, although interestingly the educators interviewed did. This is a further example of the gap in knowledge and expectations Jackson found between the educational setting and clinical practice. This perhaps highlights the dichotomy which can be explored between getting students ready for practice, to 'hit the ground running' on qualifying, and building in the skills needed to foster the future of lifelong learning and postgraduate learning, leading to an increase in the research output of the profession. The aim should rather be to produce radiographers who 'hit the ground thinking'.

Bourdieu (1992) noted the possibility of subfields existing within fields, each with their own rules. Moving between these subfields, for example between clinical and academic radiography would require a move across the division or boundary, such as I experienced when joining academia. The existence of this boundary within the field of radiography might explain Jackson's findings and the difficulties experienced by clinical and academic staff when handing students back and forth across this divide during their training. In this atmosphere, students may perceive *doing research* to be an academic pursuit rather than an embodied skill in clinical practice, so embedding research in the curriculum should also embed research within the radiographer habitus, meaning research will then be a normal part of practice, part of the *doxa*.

2.4 Exploring the use of Bourdieu's replacement of the concept of 'profession' with that of 'field'

There are many suggestions of how to define a profession, and what a profession is, some with lists or tick boxes of essential characteristics such as behaving morally and ethically, or having specialist knowledge all of which *need* to be matched in order for an occupational group to be called a profession. Like Whiting (2009b), a radiographer writing about professionalism in radiography students, I could find no definitive list or definition of 'profession' against which I could measure radiography. Whiting (2009b) noted thirteen characteristics of a profession but found disagreement between different authors as to which should be included when judging whether 'profession' was a fair epithet for any occupational

group. Therefore, it is almost impossible to work out if any profession is a *true* profession based on these ideas, due to the contradictions between authors and the different interpretations that may be made. My first research question is 'Why is a research base important for the radiography profession?' in which I am claiming that radiography *is* a profession. In an effort to work out if this claim can be made, I had no clear way of proceeding as no single checklist exists. However, when I read Bourdieu, and his notion of replacement of the concept of 'profession' with that of 'field', my interest was piqued, (a *punctum* in action as I explain later in Section 2.9.1 (starting on page 55), and I applied the notion of replacement of the concept of 'profession' with that of 'field' to my discussion of the radiography profession. In the first part of this section I explore Bourdieu's concept of field, which leads on to the application of his suggestion that professions act like fields (Bourdieu and Wacquant, 1992). Then with particular reference to the profession of radiography, I argue against tick box type definitions of profession, and subsequently against some of the profession's own members to suggest that when using Bourdieu's notion of replacement of the concept of 'profession' with that of 'field', radiography is indeed a profession.

Bourdieu defines a field in terms of a network loosely holding its occupants with common attributes, each of whose position in relation to their field is dependent upon the power, or capital, they possess. Bourdieu likens people within the field, such as radiographers in the field of radiography, to players in a game:

> Players agree, by the mere fact of playing…. that the game is worth playing. (Bourdieu and Wacquant, 1992: 98).

For radiography this suggests that radiographers are players who 'have a feel for the game' (Bourdieu, 1998: 80) within the field of radiography, holding different positions within one field according to their clinical or educational work. Each member of the game or field holds the knowledge and skills to be a radiographer within their habitus and is able to enact them in their work. For the game to work, all players need to have an interest in the game and must build symbolic capital to maintain the field in which they operate (Bourdieu and

Wacquant, 1992). I discuss one aspect of this symbolic capital in relation to research later, in Section 2.5 (starting on page 38).

Bourdieu made few remarks about the concept of professionalism, which Schinkel and Noordegraaf (2011) suggest may be due to Bourdieu's discussion of the concept from his perspective as a French citizen. However, Bourdieu (1992: 242) wrote that he wanted to replace the concept of 'profession' with that of 'field', in which the players of the game can only join once they have the required skills and knowledge. This idea has been taken up by others since, including Schinkel and Noordegraaf (2011) and Sahin-Dikmen (2013) although I could not find any writers in healthcare using this particular concept. Noordegraaf and Schinkel (2011) suggest that Bourdieusian concepts of field, habitus and capital, particularly of symbolic capital, can indeed be used to give an insight into professionalism and that professionalism is itself a form of symbolic capital which is socially constructed. However, if professionalism and power are related by where they sit within a field, as suggested by the term 'capital' then it is inevitable that there will be continuing struggles to maintain and grow that power through inter- and extra-professional struggles. In addition to professionalism being a form of symbolic capital, (Schinkel and Noordegraaf, 2011), certain other forms of symbolic capital need to be held by a group and recognised by outsiders before it can be seen as a profession in field terms, and acquisition of these forms of symbolic capital is the process of professionalisation.

An individual's power depends on their position within a field or the place they play in the 'game' and the amount of capital they possess, and the more power a group has within their field, the more influence they have over defining what counts as capital within their field. If, as Bourdieu suggests, individuals' expectations of the amount of capital they can attain is related to their place within the field then increasing overall capital depends on increasing expectations. I suggest that one way to increase the capital held is for radiographers to increase their expectations, to be more ambitious as a profession and continue the work of

defending their field borders, for instance against the medical field which is discussed in Section 2.4.2 (starting on page 31).

Symbolic violence is a term Bourdieu uses to describe the way individuals are limited in some way through being treated differently by a dominant group, for example by being denied resources, treated as inferior or having their aspirations limited. Moreover, Bourdieu suggests that symbolic violence 'is exercised upon a social agent with his or her complicity' (Bourdieu and Wacquant, 1992: 167). This happens because for those subject to symbolic violence, this seems to be the normal situation, whereas, to use Bourdieu's terms, they have misrecognised the reality of the situation. For radiography, the dominant groups as perceived by students could be educators, both academic and clinical, or individuals within the field of radiography who may be perceived as dominant because of the symbolic capital they hold. For radiographers themselves, the dominant group most closely associated is the radiologists. Similarly, the profession is subject to symbolic violence by the media who propagate the myth that only nurses and doctors staff hospitals. This situation was recently addressed by the SOR with their campaign 'The NHS is NOT just doctors and nurses', saying this was:

> in response to member frustrations about the perception that health services are staffed only by doctors and nurses and how they are responsible for every aspect of patient care (Society of Radiographers, 2018).

In addition, they give the example the BBC's *Holby City* and *Casualty* as television hospital dramas that do not accurately portray the roles of radiographers.

2.4.1 Putting replacement of the concept of 'profession' with that of 'field' to the test for radiography

To be recognised as a profession, an occupational group needs recognition as such by others. For radiography, these others are other professions such as medical practitioners, other allied health professionals and nurses, and also service users and the public. However, as I have discussed here, there are many definitions of 'profession' between which

there is variation in what exactly constitutes a profession. Using Bourdieu's notion of a 'field' to represent a profession, it is less important to know what exactly a profession *is* and more important to know *what it does* to maintain its position. Writing from an American perspective Campeau (1999) suggests that non-medical health professions have gained respect and professional recognition by promoting the education of practitioners and by defining their role themselves as professionals. In the UK, one of the ways the SCoR asks radiography to affect the view of others is by increasing the range and volume of research performed by its members. This is an attempt to increase the symbolic capital of radiography, thus strengthening the borders of its field and strengthen its identity as a profession.

Freidson (1988) suggests that occupations he refers to as 'paramedical' professions (Freidson, 1988: 69) need to control an area of work separate to that of the body of medicine, but he says this does not make them professions in themselves. His definition of 'professional' such as medicine is a group with a research base. However, Freidson was writing in 1988, around the time that in the UK, professional groups such as his 'paramedicals' were moving to a university, research-based education. Accepting Freidson's idea of a research-based education being necessary for a profession renders his view to be outdated and contradictory, since he suggests that the professionalisation of medicine began with the advent of university tuition for medical doctors so to follow his argument, university tuition for other groups, including radiography, confers professionalisation. A university education is another example of cultural and symbolic capital working for radiography to be seen as a profession.

In the hierarchy of occupations (Freidson, 1988), those occupations seen to occupy the highest tier tend to call themselves professions (Howsam, 1985) although as Hugman (1991) suggests, professions are not types of occupations but social constructions by which members of an occupation seek to control that occupation, or rather the membership of the profession. Traditional professions of this sort include law, medicine, and university professors while newer professions include architecture and engineering. Both Etzioni

(1969) and Howsam (1985) identify further, lower tiers of the professional hierarchy, both emergent professions, meaning developing professions which will become professions in the future, and lower still semi-professions (Etzioni, 1969). This last group are seen as occupations meeting some of the criteria of professions but not yet all of them, according to the tick-list method of differentiation. However, they do all occupy Bourdieusian fields, so the concept of profession as field does work here, even for what may have been described by others in terms of *nearly* professions.

Considering these descriptions of profession, radiography is a 'profession' if a field concept is used to reinterpret the original discourses. I now look at what writers in radiography itself have to say about its status.

The SCoR's own discourse is one of professional status, which, according to the available literature outlined below, was achieved many years ago. In 1937 state registration of radiographers became a reality; a situation which Moodie (1970) suggests conferred 'professionalisation' since he maintained that registration means that authorities recognise the high standards of the members of the profession, in other words there was external recognition of the profession by the state. This is an example of the recognition of symbolic capital held by the profession and adding to it by conferring state recognition. In 1960, the Council of Professions Supplementary to Medicine (CPSM) became the registration body for radiographers. The Registrar of the Council said in 1961 that 'supplementary does not mean subordinate' while Moodie (1970) said of the registration that the state registered radiographer title 'on paper at least it put an end to the master servant relationship with the doctor' (p70). Denley summed up the progress of radiography into a profession, suggesting that the SOR would have been surprised to find:

> ...that within a period of 50 years the few bits and pieces which they [the society] were trying to link together would have developed into a profession which would be given State recognition... (Denley, 1967: 192).

With registration, radiography along with other non-medical groups including physiotherapists and speech therapists became recognised by the State as a profession. However, this title was at the time considered to be a recognition of the radiographers' duties, rather than their academic learning, and by implication their lack of a research informed body of knowledge (Larkin, 1978) although this clearly did not seem to matter at the time. The Health Professions Council succeeded the CPSM in 2002, which then became the Health and Care Professions Council in 2012. The HCPC sets standards for the professional conduct of health professions including radiographers (HCPC, 2013) as does the SCoR, who publish a Code of Professional Conduct (Freeman, 2013). The word 'professional' in each title confirms the status that each organisation gives to radiography.

According to the radiography profession's own discourse, radiography has already moved from a semi-profession to a profession, as outlined abov, but there have been voices within the profession offering less-positive views. Writing soon after the move of training into higher education in 1992, Hammick identified the importance of research to radiography in its *claim* to be a profession, saying:

> Systematic enquiry to assemble new knowledge, and to legitimize present practice(s), is vital to support the claim to professionalism by radiography practitioners (Hammick, 1995: 135).

Several years later, in 2006 Adrian-Harris, a radiography educator, questioned whether radiography was still an emerging profession. He suggested that a profession, particularly one in the medical sphere should have the following characteristics:

> ...responsibility to the public, a complex body of knowledge, controlled admission/entry into the profession and, in some definitions, autonomous practice and the need for continuing professional development (CPD) (Adrian-Harris, 2006: 47)

This list of items recalls the tick box exercises that I have found difficult to use to decide on professionalism, due to the inconsistencies between different lists and lack of empirical evidence for the inclusion of items, unlike Bourdieu's replacement of the concept of

‘profession’ with that of ‘field’ there is no need for fixed criteria. Adrian-Harris (2006) goes on to suggest that the profession has made little progress in these areas in the past 10 years (from 1995) or the past 30 years (from 1975). While there is evidence given in the article that there has indeed been change, Adrian-Harris appears to refute his own evidence and suggests that radiography is still an emerging profession at the time of writing. One of his suggestions is for radiography to perform and publish more research, particularly in the science, practice and management of radiography. This complements the theme of my research, although I believe this activity is about symbolic capital and professional field borders, rather than part of a process of professionalisation.

Hogg et al. (2007) use Downie’s (1990) definition of a profession to suggest that although there were clear advances in professional status when comparing the position in 1980 to that in 1920, and again in 2007, they consider that radiography was still not a true profession in the traditional sense, but have only used Downie’s criteria to reach this conclusion. They do however suggest that research, amongst other factors, has increased the radiography knowledge base, which is one of Downie’s criteria for a profession. However, like Adrian-Harris (2006) before them, they seem to feel that the evidence given to show that radiography is a profession is still not enough, while paradoxically constantly referring to radiography as a profession in this and another publication only four years later (Hogg, 2011; Hogg et al., 2011). Perhaps the years since then have seen more change than before as more radiographers become research active and display their ‘symbolic research capital’ from their ‘field’, which might change this opinion.

A radiography educator, Whiting (2009c; 2010) wrote about radiography and professionalism following on from her doctoral thesis (2009a). I agree with Whiting that it is difficult to define ‘profession’, but she considers that radiography was still moving towards professional status during the fifteen years up to 2009. Whiting suggested that these changes included increased education and training for radiographers that would lead to:

> ...opportunities for radiographers to influence changes in practice, negotiate further role extensions, and contribute equally with other professional groups - thus validating professional status (Whiting, 2009c: 4).

While increased opportunities for radiographers represents progress for the profession, the opportunities do not in themselves 'validate' the professional status but could be seen as ways in which radiographers are increasing their capital by doing boundary work around the field of radiography: a continuous process rather than an event. Indeed, Whiting acknowledges this saying:

> Without substantial practice-based research, radiography cannot satisfy its responsibilities towards quality and effectiveness – moreover it restricts radiography's authoritative influence within healthcare, which further undermines professional status (Whiting, 2009c: 4).

The importance to radiography of being a profession is to bring status and respect which Whiting (2009c) suggests will bring a concomitant improvement in the quantity and quality of student applicants in terms of 'skill, humanity, academic ability, and ambition' (Whiting, 2009c: 5) to the profession. She suggests this is due to increased competition for places, leading to increased patient care and public visibility of and trust in the profession. This view from 2009 is perhaps not so relevant now in 2019 when the removal in 2017 of grants and bursaries for health courses may be having different effects on recruitment.

Arguing against professionalism for radiography, Whiting (2009a), further suggested that professional development may be adversely affected as some of the traits of professionalism which she identified may be suppressed by a perceived need for a radiographer to be technically competent and efficient in practice, echoing the thoughts of Bolderston (2010) above. This agrees with Freidson (1988), who, writing in 1988, suggested that the professionalisation of some occupations may have the adverse effect of leaving students dissatisfied with their choice of profession when they find that they are not able to act as fully independent professionals, but can feel subordinate to the medical profession, feeling they are instead a *technician*.

The main arguments by these writers is that radiography is not a profession when compared to different criteria for defining a profession, which is surprising given the discourse from professional and governing bodies. However, there is disagreement about what defines a profession, and the choice of benchmarks is arbitrary and not explained. This is where Bourdieu's (1992) suggestion of replacing the concept of 'profession' with that of 'field' makes sense as it offers no definition of profession but does offer the concept of 'field' as a way to think about occupational and professional groups. Based on this concept radiography IS a profession. Perhaps regardless of the label given by others to radiography, whether semi-profession, a group undergoing professionalisation or profession, what is important is the work done by its members for the benefit of its patients. A thread runs through some of these writers above, which suggests that an increase in research activity could improve the way others see radiography as a profession through their recognition of symbolic capital within the field of radiography and this concept is discussed next.

2.4.2 Maintaining the field: Professional bodies and boundary work

Applying Bourdieu's notion of replacement of the concept of 'profession' with that of 'field' means that the profession of radiography, as all professions, must constantly attend to their borders, which they do by building capital. For radiography, those at the edges of the field include radiology the medical doctors who work alongside radiographers, into whose field radiographers are trying to extend their reach and other health professionals from whom radiography is defending the boundaries of their field. In the 1920's, when radiology and radiography were emerging as professions, radiologists resisted allowing anyone but medical practitioners, in other words themselves, to report on x-ray images (Witz, 1992). I interpret this as boundary work by early radiologists to make their position clear not only as being above radiographers but also being equal to other medical specialities. In a study of radiologists, Burri (2008) suggests that there has been a breakdown of some of the barriers between radiologists and radiographers more recently as the result of new technology such as Computerised Tomography (CT) and Magnetic Resonance Imaging (MRI) producing a

new kind of image compared to plain x-ray and ultrasound images. In the 1970's when these changes in image production started, Burri draws on Barley's (1986) observations of radiology departments to suggest these changes to the barriers came about because the new technologies had to be learned by looking at images and discussing them as they were produced rather than later in a reporting session. In other words, for a while radiologists came out of their reporting offices and into the scanner control rooms, where the radiographers worked. However, at that time radiologists still resisted allowing radiographers to report on the images demonstrating the 'space of competition and struggle' (Bourdieu and Wacquant 1992: 243) at the borders between the professions. Burri (2008) continues with a discussion of radiologists defending their professional field against other medics, which centres on radiologists feeling that they have the best knowledge and experience to interpret and report on images. This attitude may account for the longstanding resistance towards radiographer reporting as radiologists resisted reporting by *any* other group or profession outside the boundaries of radiology. Indeed, some twenty years after the inception of radiographer reporting, a skill previously wholly within the domain of radiologists, there is still resistance from radiologists despite numerous research papers written by radiographers in support, for example Piper et al. (2005), Brealey et al. (2005) and Woznitza et al. (2018), perhaps as radiologists continue the defence of their boundaries. Interestingly there are no papers by radiologists proving they are as good as radiographers are at reporting- it is always the other way around, perhaps because radiologists claimed reporting exclusively as their work since the early days of the two professions (Larkin, 1978).

2.4.3 Expanding the field: Radiographers 'care for' and 'care about' patients

Radiographers are now increasingly taking on roles and activities previously within the remit of the medical profession, in particular of radiologists, but these have not been easily gained. Writing in 1983, before radiographer role extension was happening, Larkin (1983) suggested that medical specialities had found space and resources to develop by passing those tasks deemed less pleasant or lacking in esteem to other members of the health labour force. An

example of this is the way radiographers started reporting some, perhaps more basic, radiographs so that radiologists could concentrate on reporting the ‘new’ imaging formats such as CT and MRI.

This process of delegation of tasks from an established professional group such as medicine implies that the new group of operators is in some way inferior to the first group. Larkin (1978) suggests that radiology, a group of medical practitioners, started this way itself as a new division within medicine, so having a low status themselves compared to established branches of medicine such as general physicians and surgeons. At the beginning of the twentieth century, they shared this low status with specialists such as anaesthetists, pathologists, and obstetricians. By passing less-desirable tasks to radiographers, in those times the act of producing the images, while keeping the task of reporting images to themselves, radiologists worked on strengthening the boundaries of their own profession. Since radiography evolved as a lower status to radiology, it may be that the radiology profession, in an effort to boost its own status, suppressed the status of radiography more than might have happened if radiology had already been an established division within medicine. Larkin (1978) notes that as early as 1903 there were comments about lay radiographers in the BMJ (British Medical Journal) and a position evolved where lay radiographers could practise radiography but could not offer a diagnosis based on the images produced. Larkin (1978) also reports on the issue of the medical profession basing some of its control over the use of x-rays on the fact that they are dangerous due to their nature as ionizing radiation even though at the time, the early twentieth century, the nature of this danger was not fully understood. Nevertheless, as part of their professional boundary building, the medical profession claimed that public safety could only be maintained by them having supervisory powers over anyone unqualified as a medical doctor using x-ray equipment: another way of suppressing the field of radiography.

The power relationships in caring professions including nursing, remedial therapies and social work were explored by Hugman (1991) and links to the notions discussed of less

desirable tasks being passed down to an ‘inferior’ profession. While his work did not specifically include radiographers the background to their professionalisation is similar to the other professions included, and Hugman’s theories can help to explore power and the radiography profession in a like manner. Hugman (1991) suggests that there is a difference between ‘caring for’ a patient and ‘caring about’ a patient. ‘Caring for’ a patient involves the physical acts of caring for a patient such as administering medicines and changing soiled linen, physical tasks historically associated with women, either in the home or in a professional caring role and which can be equated to less-desirable tasks. By contrast, ‘caring about’ is described as a hands-off thinking task such as prescribing the medicine or being concerned, (at a distance from the patient), about cross infection risks, which are associated with the historically masculine role of medicine. For medical imaging this can be interpreted as the ‘caring for’ duties of the radiographer looking after the patient being imaged, while the radiologist is more at a distance, reporting on images taken, in some cases after the patient has left the department. This split of doing or thinking links back to the idea of ‘hit the floor running’ versus ‘hit the floor thinking’. I suggested before that a ‘hit the floor thinking’ habitus is needed instead of a dichotomous split. However, the roles of both professions are not always as clear-cut as this and, like other professions, have increasing overlap.

Each profession attempts not only to control its own members but also to exclude others who do not have the necessary qualifications to join. Hugman (1991) refers to this phenomenon as closure, by which a profession restricts access to others for example by setting an educational barrier to entry, thus forming strong boundaries around itself. Hugman continues that the stronger the barriers to entry through its control of who may enter the profession by the awarding of its qualifications, the stronger the perceived boundaries of that profession. Radiography is actively maintaining its boundaries, or barriers to entry as a state registered profession by defining the qualifications needed to become registered to practise, but so is radiology as part of medicine, meaning there is an interface at which some

undesirable tasks, perhaps undesirable because of their consumption of time or their routineness, may be handed down to radiography. As this is a one-way movement, the boundary barriers between the two professions are maintained more robustly by radiology, in an effort to keep all desirable or high prestige work for themselves.

The place of research in increasing the body of knowledge and thus infer professionalism on a discipline such as radiography is well recognised and promoted by writers in the field of radiography (Malamateniou, 2009; Probst et al., 2011). However, radiography has been slow to perform and report its own research, its knowledge base originally being built on research by other professions such as doctors and physicists and has thus been described by Nixon (2001), echoing the words of Etzioni (1969: 31) as 'semi-professional'. Nixon proposed that the primary tool in the professionalisation of radiography is research skills, a sentiment echoed by Sim and Radloff:

> An important aspect of professionalisation is the continuous growth of professional knowledge through ongoing research conducted by members of the profession (Sim and Radloff, 2009: 205).

In a discourse analysis of articles related to professional identity in the leading journal for radiographers, *Radiography* Niemi and Paasivaara (2006) found three main themes related to professional identity: a technical discourse related to changes in technology, a safety discourse related to patient care during examinations and thirdly a professional discourse concerning promoting the profession and professional identity. Again, radiographers are articulating the importance of research by radiographers.

Even the type of research in which the radiography profession has been involved has been influenced by the position of the radiography field within medicine. For example, both Hammick (1995) and later Adams and Smith (2003) note that physicists and clinicians historically controlled research in imaging to the detriment of radiographers' development in this area in the past. Perpetuation of this system through the previous lack of research teaching for radiographers led to some methodologically weak studies and poor rates of

publication. Hammick suggested in 1995 that research in radiography was 'strongly influenced by the positivistic tradition' (Hammick, 1995: 140) derived from the 'biomedical model of health in a market-orientated service, driven by quantitative outcomes' (Hammick, 1995: 139). She argued for a new paradigm in radiography research in which both quantitative and qualitative research have a place, to cover the positivistic, scientific technology driven element of radiography and the interpretive, social, patient focussed aspect of the profession. Fortunately, fifteen years later Murphy & Yielder (2010) found that radiographers were starting to conduct research within a qualitative paradigm but questioned the rigour of other researchers' approaches. They seem to critique qualitative research from a position of scepticism of the qualitative paradigm, even though they are attempting to assist the budding qualitative researcher. For example, they suggest that:

> Qualitative research can be hampered by confusing and conflicting literature, verbose terminology and a lack of structured models to provide a rigorous measure of the quality (Murphy and Yielder, 2010: 62).

I question whether it might really be any more 'confusing', especially to a novice researcher, than understanding statistical analysis in the quantitative paradigm and feel this is a weak argument against qualitative methods. Munn et al. (2013) comment that although there is a history in medical imaging of quantitative research, more qualitative research may preserve the 'humanity' (Munn et al., 2013: 47) within the profession, in the way Punch (1998) suggests that using qualitative data is a way of interpreting the human relationships aspect of the practical side of the daily delivery of the service.

2.4.4 Expanding the field: Not just 'women's work'

Hugman (1991) in his discussion around 'caring for' and 'caring about' touched on the historical basis of the differences between the caring professions in terms of gender, and through that, power and the influence on professionalism. Many writers have discussed this issue but here I briefly contextualise the issue of gender in radiography.

Witz (1992) discussing professions and patriarchy, notes that although radiography was mixed gender from the beginning, male radiographers who were mainly army personnel had sought to exclude females, who were civilians, by setting up a diploma and examination. The premise was that females would be unable to cope with the rigours of the training and lack the academic abilities needed to pass the exams. However, this exclusion attempt was not effective, and by the 1920s, radiography was a female dominated occupation. Indeed, both Moodie (1970) and later Witz (1992) noted an article in the Daily Telegraph in 1930 suggesting that radiography was a job suited to women as it was undemanding and easy to succeed, requiring an investment of only one year and 20 guineas to train. At the time, the SOR wrote to the editor complaining that the article was misleading, and while I also take issue with the idea of radiography being an undemanding job, certainly many women have made successful careers in the profession. Munn et al. (2013) comment that there is a history in medical imaging of quantitative research, a legacy of the medical profession's investigation into disease and imaging, without consideration of the human relationship between the professional and the patient. This has had a lasting an effect on the profession while Hammick (1995) notes that physicists and clinicians historically controlled research in imaging to the detriment of radiographers' development in this area. This has led to a proliferation of quantitative research in radiography, although more qualitative work is now undertaken as the profession defines its own field. This phenomenon is not confined to radiography, for example Challen et al. (1996) compare radiography to midwifery, another profession aiming to increase their profile through research. Their main aspect of comparison is that both are female dominated professions working with mainly male medical staff, intimating that this gender imbalance may have led to a lack of confidence within the female dominated profession. Similarly, Yielder (2010) suggests that power in the field of health is held by the medical profession partially as a consequence of it being an established, male dominated profession compared to radiography which from as early as the 1930s was dominated by female members.

While the gender profile of radiographers and medical doctors has changed in the last twenty years, this gender difference legacy may still be affecting the profession as a form of symbolic violence defined as a subjugation of one group, radiographers, by another, the medical doctors (Bourdieu and Wacquant, 1992). This needs to be challenged by radiographers with a research element to their habitus as they 'care about' as well as 'care for' patients in their practice.

2.5 Symbolic capital: Building 'symbolic research capital' from the base

Bourdieu outlines three forms of capital, first economic capital such as income or property, secondly cultural capital such as holding academic qualifications which could be converted to economic capital, and thirdly social capital such as a network of personal relations which again may be convertible to economic capital (Bourdieu, 1986: 17). Each of these three types of capital can be seen as symbolic capital:

> …which is the form that one or another of these species may take when it is grasped through categories of perception that *recognise* its specific logic or, if you prefer, misrecognize the arbitrariness of its possession and accumulation. (italics in the original) (Bourdieu and Wacquant, 1992: 119)

This suggests that it is not enough to accumulate symbolic capital, as it needs to be seen and understood to be such by outsiders, for example those in other professions or the public.

I am proposing the expression 'symbolic research capital' to mean a particular form of symbolic capital which can be seen and recognised as a capital by others, which in this case is the body of work produced by a profession in the form of research activity, including those who produce it and those who use research in their practice. Individuals can act across this spectrum of research activity, taking different roles at different times. This varies from previously suggested ideas about research capital, for example Green and Rein (2013) used the term 'research capital' to encompass the resources and expertise needed for research projects. Later Brown (2017) used the term 'research capital' to denote the use of research by practitioners:

> …the notion of research capital (RC) corresponds to situations in which teachers both can and wish to use research collaboratively to improve teaching and learning, with higher levels of research capital being more optimal in nature (Brown, 2017, online journal)

This suggests the term was used to describe how likely teachers are to use research evidence practically, rather than doing their own research or how this situation is perceived by others. Neither of these uses of the term, or mine, are related to investment of money (capital) in research projects by funding bodies.

For radiography 'symbolic research capital' takes the form of a body of knowledge based on published research outputs and a growing number of visibly research active members of the profession but also includes all radiographers who partake in research activities such as critical reading or implement evidence based practice in their activities. For example, the SCoR (2015a) *Research Strategy* document quantifies the number of radiographers who should hold a doctorate by 2021 as 1% of the workforce, or about 300 radiographers, with many strategies suggested to help reach that number, including embedding research in the curriculum, which is the focus of my research. Clearly building the numbers of research active radiographers in a visible, countable way seems to be important to the profession in maintaining and growing its status. This includes being recognised as trustworthy by patients and other professionals. I shall explore further the concept of cultural capital in the form of academic qualifications and 'symbolic research capital' in the next section.

As previously discussed, the SCoR (2015a) defines research in radiography in terms of its importance for radiographic practice and education, raising the profile of the profession and improved patient care by expanding research capacity within the profession, using research as a form of symbolic capital. One focus of that work came from the SCoR *Research Strategy* document. This was the aim of 'Building professional credibility through research' (Society and College of Radiographers, 2015a: 3). The following section explains how radiographer education has moved from the apprentice type training of a diploma to a degree qualification, a move that was essential to support research within the profession. I

discuss here the changes in radiographer education over time and how the boundaries of the radiography field have been formed, with reference to the importance of research for the profession. I discuss how to use this to improve patient care in Section 2.6 (starting on page 48).

2.5.1 Student body: The position of research in the radiography curriculum

There follows below a discussion of the implications of the introduction of research into radiographer education, which has culminated in a compulsory research project module, which must be passed to give the student enough Level 6 credits to gain the 'Hons.' appellation needed for registering for practice with the UK professional register, the HCPC.

By the 1930s, radiographers needed the qualification Diploma of the College of Radiographers (DCR) to practise, which combined both academic and practical clinically based skills in similar ratios (Bentley, 2004). The syllabus was produced centrally by the College of Radiographers for educational establishments and involved much rote learning (Hammick, 1995; Hogg et al., 2007; Merriman, 1998) but no critical thinking or research skills. This became a problem for the profession as Price (2009) shows, when in 1986 discussions were underway between different professions allied to medicine, including Occupational Therapists, Speech Therapists, Orthoptists, Dieticians, Chiropodists and Physiotherapists and the now defunct Council for National Academic Awards (CNAA) with reference to the move to a degree qualification. At the time, the DCR was not recognised as a degree equivalent qualification, although other professions' qualifications were accepted as such. This was because the academic content of the DCR was not considered to be of a high enough standard for a degree. Radiography risked being demoted from being a profession equal to other professions allied to medicine if it had not become a degree at this point, but fortunately, following further discussions, the CNAA did eventually recognise the DCR as a degree equivalent. As a result, in 1989 the qualification for registration changed from a diploma to a bachelor's degree (Price, 2009). From the perspective of syllabus setting and examinations, radiographer education ceased to be a function of the College and

Society of Radiographers, and local hospital-based schools of radiography became part of HEIs. In many cases, these HEIs were polytechnics (Pratt and Adams, 2003). With this move to the higher education sector, at the same time as the other professions allied to medicine, the curriculum content became the responsibility of the HEIs. The impact on radiography was a move from the content-based DCR to the evidence-based curriculum of a degree while still maintaining an equal split between academic and practical learning, as is still the case today. After the 1992 Further and Higher Education Act (HMSO, 1992) the polytechnics became universities, and in 1993, radiography became an all-graduate entry profession. Thus, the new occupation of radiography became a university degree-based profession within one hundred years.

Writing in 1998 soon after these changes, Merriman (1998) found little difference between diploma and degree graduates' attitudes to how they felt on qualification, in three health professions. However, she cites Jowett et al. (1994) who found the opposite in nursing, perhaps due to greater publicity around the Project 2000 nursing education changes impacting graduates' expectations. Merriman suggests that one of the drivers for change in the location of non-medical student training was linked to contemporary government pressure on HEIs to increase student numbers and add vocational and professional degrees to their traditional subjects rather than any efforts to raise the level of research being done in these professions. Coles (2004) hints at the perceived difference between vocational and traditional academic subjects, with the former being seen as lesser or second class compared to the latter. However, the now superseded Higher Education Funding Council for England (HEFCE), in a report on vocational degrees suggest that highly vocational degrees such as medicine, dentistry, veterinary sciences and subjects allied to medicine of which radiography is one, are those in which a high proportion of graduates are employed in a small range of highly skilled occupations (Higher Education Funding Council for England, 2018). Therefore, for radiography, the label vocational degree should not obscure the

academic quality of the degree, indeed students on the course have to combine a rigorous academic programme with their practicum.

Research has not always been a feature of the radiography curriculum. As previously mentioned, the DCR training involved practical clinical experience and academic rote learning and was the highest qualification attained by the majority of the radiography workforce. The post-registration course, Higher Diploma of the College of Radiographers (HDCR), first introduced research into the post-qualification curriculum during the 1980s (Challen et al., 1996). By contrast, learning about research is now part of the undergraduate curriculum for all radiographers, culminating for many students in a compulsory research project. In Midlands University, where my research took place, the project must be passed by students for them to gain enough credits for an 'Hons.' status undergraduate degree, without which a radiographer cannot register with the Health Care Professions Council (HCPC), itself a prerequisite for practice. Now at postgraduate levels, radiographers have the opportunity to study and practise research at PGDip, MSc, and Doctoral levels, with the first radiographer gaining a doctoral degree in 1994 (Snaith et al., 2016).

About 20 years ago Nixon (1999) investigated the links between the research needs of the radiography profession and how educators were meeting those needs for undergraduates. At the time, research methods were taught in all education centres with final year students carrying out primary research leading to a third-year dissertation. Nixon noted that political and ethical issues abounded, for example, there might be changes to some student projects to avoid needing ethical committee approval, which is still a consideration now, and one of the reasons why primary research was stopped at my university. Nixon identified overall three aims of undergraduate teaching, which are current today, and appear in the original document as follows:

- develop a basic understanding of the skills and knowledge required to undertake research
- develop a questioning attitude toward clinical practice
- instil an awareness of the current and future needs of the profession with the ability to develop appropriate research questions. (Nixon, 1999: 243)

These aims include skills and abilities in research practice but there is also an awareness of the link to the future of the profession both for the benefit of patients and the profession. Although at the time of writing in 1999, Nixon spoke of a fight for recognition as a profession, I argue that radiography is already a profession in 2019, but I agree that there is ongoing work needed to maintain that position.

Writers from other disciplines also value the final year dissertation, for example Garde-Hanson and Calvert (2007) note that the dissertation has a prominent role in a student's learning about research, calling it the 'gold standard' of undergraduate assessment. Several other writers outside radiography discuss ways of teaching research in the curriculum whereby students are enabled to perform a research project themselves. For example, Winn (1995) and Jansen et al. (2015) describe students joining in an established research project in co-operation with teaching and clinical staff while Krüger (2015) discusses third year research projects building on research teaching throughout the first two years. Their comment about additional resources to realise these schemes acknowledges the extra input from teaching staff. In addition, they identify a mismatch between descriptors used in the UK in both Further and Higher Education at Level 4 and the higher-level descriptors such as appraisal and evaluation more often associated with research, but the overall message is that research should be incorporated in the curriculum rather than research teaching being a *how-to* set of lectures.

A few years before the SCoR (2015a) *Research Strategy* was published, with its emphasis on embedding research in the curriculum, Healey & Jenkins (2009) and Healey et al. (2014) in association with the Higher Education Academy authored papers on undergraduates'

engagement with research and how this might impact on higher education in practice. The focus of the 2009 paper was on integrating research into the curriculum, with examples from various disciplines including health-based students, but not specifically radiography. However, it describes many projects that were successful in their words 'integrating' research into education. The 2014 paper published with The Higher Education Academy (HEA) offers strategies based on case study analysis for introducing first year students into research, which I interpret as ways of 'embedding' research. All these writers value the third-year project and Healey's use of the expressions 'integrating' and 'embedding' echo the SCoR's use of the word. Embedding, in the way I am using the word, meaning implanting an idea so it becomes ingrained, is stronger in purpose than integrating, which suggests 'combining'. So to me, embedding research within the curriculum needs doing in conjunction with embedding within the habitus.

While the research just discussed is from a variety of backgrounds, I found little that deals with teaching research in the radiography curriculum apart from Higgins et al. (2013) and Higgins et al. (2014) who suggest that the radiography profession lags behind others in health care when comparing research output which might lead to a weakening of the professional field boundaries. They advocate that teaching research early in the course will improve the research culture, in line with the 'embedding' of research in the curriculum by the SCoR. Higgins et al. (2014) identify that a change in research culture is needed, and requires strategic policies and actions, in other words this is a change that must be supported by the profession, the universities, and the policy makers, as well as local teaching teams.

To conclude, the twentieth century saw the emergence and establishment of many professions allied to medicine that have evolved from apprenticeship type training under the control of the established medical profession, to degree level registration as professions themselves. In Bourdieusian terms, the fields of these professions have become more clearly defined as they have become separate from medicine. The introduction of increased

academic skills and research teaching into these professions' syllabi is, I believe, a step towards these professions increasing their academic and symbolic capital, giving them the power to maintain their professional field boundaries. Over time, research teaching and learning has become a compulsory feature of all radiographer training and how this is approached in one HEI is the subject of this research.

2.5.2 Evaluating 'symbolic research capital' in boundary work

In Section 2.3 (starting on page 14), I suggested that there is a need to embed research in the curriculum to ensure that radiographers have skills and abilities related to research activity when they qualify. In this section I explore how the spectrum of research activity as a form of 'symbolic research capital' can be used to maintain the professional 'field' with particular reference to the expansion of radiographers' work into reporting images.

The role of the radiographer has developed since Furby's (1944) opinion in 1944 that the radiographer was primarily of service to the radiologist. Speaking as a radiographer, Furby recognised that to improve their status, radiographers needed to study beyond their first qualification although he expressed reservations about radiographers attempting to interpret images. During the 1990s, there was a breakdown of some of the previously strong professional barriers between radiology and radiography leading to radiographers taking on some of the tasks previously performed by medical staff. At this point postgraduate level education became available for radiographers as they learned new skills for practice. One of these arenas of change was radiographers training to interpret images, with the agreement of radiologists. Snaith has written extensively over the last ten years on the now established role of radiographers in reporting images suggesting that one of the drivers of this role extension is professional aspiration. However, as I suggested above, it could also be due to radiologists letting go of a less desirable task, for example plain film reporting, in order to concentrate on more complex new imaging such as CT and MRI (Burri, 2008; Snaith et al., 2015).

There are many examples of publications by radiographers which have found that radiographers are able to report plain films to the same standard of accuracy as radiologists, with the aim of *proving* through research that one profession is as good as another in a particular role (for example Brealey et al., 2005; Piper et al., 2005; Woznitza et al., 2018). In a systematic review Hardy et al. (2016) confirm that interprofessional comparisons were one of the main issues addressed by this type of research, suggesting this reflected priorities in radiography at the time the papers in their study were written. In this competitive relationship, which equates to boundary work, there is a marked absence of radiologists undertaking and publishing studies to show that they are as good as radiographers in some aspects of professional activity. Similarly, there are papers asking radiologists about their perceptions of radiographer role development but not the reverse. For example, Forsyth and Robertson (2007) found that the 132 Scottish radiologists surveyed were supportive of the development of radiographers, acknowledging that the professional standing of radiographers would benefit from role development, but they had some reservations including adverse impacts on their own profession and encroachment on its boundaries in another example, as previously, of one profession defending its borders against another.

2.5.3 Evaluating 'symbolic research capital' in promoting the radiography profession

Coombs et al. (2003) in a qualitative study to investigate perceived barriers to working as a radiographer in the NHS, interviewed eighty-eight individuals from school children to radiographers in a range of roles, none of whom were currently working in the NHS. While their main aim was to find out how attractive the NHS was seen as an employer, they found that radiography as a career was perceived as boring and routine, the only positive aspect being working with patients. This reinforces the feeling within the profession that radiographers are seen as 'button-pushers', a phrase in use as early as 1944 when Furby (1944) suggested that to others the role of the radiographer may seem to be just 'press the button' (Furby, 1944: 9). Indeed, the public may be completely unaware of the role of radiographers. Djurić et al. (2010) asked university students and members of the public in

Slovenia about the radiography profession. Although a small sample, one third of the members of the public asked did not know what radiographers did. Similarly, in the UK, while the press often mentions nurses and doctors as health worker, it is rare for other health care professions to be mentioned, much less radiographers. For example, 2017 saw the removal of the bursary for all nursing, midwifery and most allied health students, but the UK press discourse is about the removal of nursing student bursaries, with other groups only gaining mention outside the headlines, if at all.

There is discussion about whether any health profession *needs* a degree course much less one focussed on research. McNamara (2008) debated this subject in relation to nursing, noting a 'discourse of opposition' (McNamara, 2008: 459) in Ireland when nursing education moved to the higher education sector. As radiography is less well known by the public than nursing, the debate in the UK public has not yet been noted. One answer to this criticism of higher education is that particularly in the UK the development of allied health professionals and nurses as advanced practitioners demands that individuals have a good academic background to allow them to progress to the required post-graduate training. In practical terms radiographers need to be able to practise, and to develop practice (Henderson, 2011) for the profession to strengthen its position and for patients to benefit in the clinical situation.

These studies show that radiography is a poorly recognised profession among the public, despite 43.1 million imaging tests taking place in England alone in the 12 months from December 2017 to November 2018 (NHS England, 2019) on a population of 55.6 million people (Office for National Statistics, 2018). The value of radiographers' symbolic research capital to 'Raise the impact and profile of radiography through high quality research focussed on improving patient care and/or service delivery' (Society and College of Radiographers, 2015a) seems clear, but we need to create that research before it can be used.

2.6 Research in practice- impact on the patient body

Radiography is a caring profession, combining the use of technically advanced machines and patient care to produce diagnostic medical images. Research only has value in this setting when used to inform practice within the professional field, which for radiographers means using research to the benefit of patients. As previously discussed, the SCoR (2015a) defines research in radiography in terms of its importance for radiographic practice and education, raising the profile of the profession, and improved patient care by expanding research capacity within the profession, thus using research as a form of symbolic capital. One focus used for that document came from the SCoR Strategy 2015-17 document. This was the aim of 'Building professional credibility through research' (Society and College of Radiographers, 2015b, 3). Although that document is no longer available, it has been superseded by *The 2018-20 Strategy of the Society and College of Radiographers*. In this newer document the aim above is the more inclusive and patient oriented 'Raise the impact of radiography world-wide through patient focussed research' (Society and College of Radiographers, 2018). This section explores the theme of building the evidence base for radiographic practice and its impact on professional credibility and how this is used to improve patient care.

2.6.1 Constructing the knowledge base for radiography - Evidence Based Practice

There is an expectation by the CoR (2013) and the HCPC (2013) that radiographers base their activities on evidence-based practice, meaning that previous research informs current practices. Hafslund et al. (2008) identify the act of decision making in care as the culmination of an individual's critical assessment of available data, suggesting that these skills need to be taught before qualification. This means it is not enough for members of the profession to perform research since an evidence-based profession must also act upon the findings of research. This position presents research as something in which every radiographer can participate, some contributing to the field of knowledge while all members can use the findings to make improvements to practice. It follows then that research as a concept

‘embedded in the curriculum’ and hence embodied in the habitus, is valuable for nurturing research active radiographers *and* research informed practice, with the proviso that there must be a sufficiently large pool of radiographers *doing* research for there to be an increasing knowledge base on which to draw.

Snaith (2013) questioned why radiography is still not a research active profession with the main bulk of the research being done by a minority within the profession. When combined with the fact that a few individuals are publishing many papers compared to many authors publishing just one (Snaith, 2013), and that some research active radiographers are publishing very little (Harris and Paterson, 2016) there may be an imbalance between the clinical professional base and the influence and impact of the few on the profession’s evidence base. Further Snaith (2013) notes that academic radiographers are expected to undertake scholarly activity and improve their research skills to doctoral level, but if there is an emphasis on one area of interest within a group of academics this may further skew the evidence base. For example, Hogg (2011) discusses how one university radiography department made conscious choices about the research direction they would take, defining two areas of interest to which all staff would contribute. Hogg noted that research output for the next Research Excellence Framework (REF) submission was one of the drivers for this decision, which was useful for the profession in terms of increasing ‘symbolic research capital’. However, there is also discussion in his paper of the clinical impact of research and by implication for patients, which brings back a balance between professional needs and patient benefits.

Meanwhile in a survey of UK radiographers’ doctoral status, Snaith et al. (2016) found that 0.1% of UK radiographers held doctoral degrees, a figure which is slowly increasing year by year. Snaith et al. concluded that ‘radiography is emerging as a research active profession’ (Snaith et al., 2016: 285), but they do not make clear whether they mean this as an increase in research within an already established profession or whether an increasing volume of research is aiding the establishment of radiography as a profession. If the first meaning is

correct here based on Snaith's earlier work where she refers to radiography as a true profession (Snaith, 2013), the suggestion is that radiography is already a profession which continues to do boundary work using 'symbolic research capital' in the form of research, its use and its dissemination. In other words, it is the research activity which is emerging or increasing, rather than radiography 'emerging' as a profession; a meaning with which I agree.

Price (2015) also raises the REF as a consideration about the importance of research output for educational establishments. The assessment of research output in the UK, known as the REF periodically assesses research outputs and allocates research grants corresponding to their evaluation of each institution's research output and environment. Radiography research first formed part of universities' return to the then Research Assessment Exercise in 1996, just after radiography's establishment in higher education (Williams, 2002). Price (2015) suggests that staff at HEIs must 'do what they can' (Price, 2015: 110) to ensure future research funding, which might mean that more focussed groups, such as Hogg's, might develop research along narrow pathways. Radiography research is returned to Unit of Assessment (UoA) 3 in the REF, alongside other allied health professions, dentistry, nursing, midwifery, and pharmacy. While radiography falls into a different UoA to medicine, it still has competition from other well-funded and larger professions which encourages Hogg's strategy of focusing of activities for impact, but as much on the REF return as on patient care (Research Excellence Framework, 2018).

Here then the link between the SCoR document's aims and the aims of HEIs to perform well in the next REF may be in conflict. Price (2015) placed the burden of increasing research firmly on HEIs suggesting that some academic staff should have a research focus, but this ignored clinical staff and their contribution to research. Similarly, Snaith et al. (2016), in a survey of 90 UK radiographers holding or studying for doctorates, found that 63% were academics and a further 10% had joint academic and clinical roles. This suggests that there is currently a bias towards academics rather than clinical radiographers being research

active within the profession, which needs to change as advanced practitioners and consultant practitioners combine clinical with educational roles. As fewer than 0.1% of UK radiographers hold doctoral degrees (Snaith et al., 2016) these figures show a further bias towards a very small proportion of the profession being engaged in research at this level whereas I suggest that all members of the profession should be research active in some way.

This discussion suggests that for a profession, it is important to consider where the evidence base originates, to avoid a possible over-reliance on academics within the workforce defining the areas of interest and evidence. Efforts to encourage more radiographers to engage with research by enthusing students, combined with pressure on advanced practitioners, and particularly consultant radiographers to engage with research as one of the four pillars of advanced clinical practice, may help to increase the number of clinical radiographers performing research and the scope of topics investigated.

2.6.2 Researchers in clinical practice

While there is a consensus that research training is important for those working in clinical practice (Harris and Paterson, 2016; Health Education England, 2017; Society of Radiographers, 2013), there is ongoing debate around the need for clinical consultant radiographers to have (non-medical) doctoral research training and a commensurate publication profile. Harris (2013) in a grounded theory exploration of consultant radiographers concluded that research was not yet fully embedded in their roles, as they are spending more time on the clinical aspects of their role than the research element. This is at variance with the ethos of the 'four tier structure' (Society of Radiographers, 2013) which expects research training and practice to be an integral part of these roles. Harris (2013) argues, as I do, that research should be a part of all radiographers' work, aligning with the position of the SCoR (2015a). Responsibility for embedding research within the profession lies with higher education (Price, 2015; Society and College of Radiographers, 2015a): the starting point for this thesis. As Reeves (2008) suggests, research in radiography is essential

to build an evidence base and calls on consultant radiographers to lead this growth, something which can only happen if research is embedded in radiography education to start with.

2.7 Influences on research capacity in the professional body

In this section, I investigate some of the influences on teaching and performing research in radiography. The Society and College of Radiographers continues to assess the position of research within the profession. In 1994, a Research Group was set up to develop a research strategy. More recently, they have issued a five-year plan *Research Strategy 2016-2021* (Society and College of Radiographers, 2015a). While this document promotes the aims of improving patient focussed evidenced based practice within the profession, it suggests that this is dependent on embedding research in both practice and education and the document states the responsibilities of HEIs. The challenge taken up by my research is to explore these responsibilities within the confines of the policies governing teaching.

Radiography is a registered profession under the Health Care Professions Council (2013), the title 'radiographer' being protected by law (HM Government, 2001). This means that to register and practise as a radiographer, an approved course of study must be undertaken successfully. The courses offered, although open to interpretation by the HEI providing them, are heavily influenced by policies and guidelines produced by the HCPC (2013) and the SOR (2013). Payne & Nixon (2001) also identify professional codes of conduct and National Health Service (NHS) policies, all of which need addressing in training programmes, but which are themselves undergoing cycles of change. Each university has policies and quality initiatives driven by the Quality Assurance Agency for Higher Education (QAA) that will have an influence on courses with regard to curriculum and pedagogy so any changes to a curriculum would have to comply with several different guidelines. My interview questions aim to discover the levels of perception of these influences on our research teaching and to uncover others I may not have considered in order to contextualise the current position of research pedagogy in my HEI.

2.8 Constraints: Barriers to research activity

I have previously discussed the barriers at the field edges between professions, exploring what this means for radiology and radiography. I suggested that building 'symbolic research capital' could help radiography to consolidate its position as a profession, ultimately for the good of patients. However, barriers of a different nature seem to exist between radiographers and their desire and ability to build their 'symbolic research capital' and while the SCoR research document (2015a) does not identify any specifically, the authors seem to be aware of barriers since many suggestions for improvements are made. The nature of some of these barriers to research activity as identified by other authors is now discussed.

Shortly after the introduction of the degree status to radiography training there were attempts to evaluate the position of research within the profession. Challen et al. (1996) questioned 102 qualified clinical staff about their 'research mindedness'. Some of them had not qualified with a degree, but with the older Diploma of the College of Radiographers (DCR), which did not include research in the syllabus. Challen et al. concluded that while there is a belief that radiographers should be research active there are perceived barriers to research activity, so work needs doing to overcome these barriers and promote research activity. This perception of barriers is a recurring theme in investigations into research activity, or the lack thereof. For example, Harris and Paterson (2016), in an investigation of consultant radiographers' attitudes towards research activity found lack of allocated time, lack of skills and a heavy workload to be the main barriers to undertaking research amongst professionals whose job descriptions included research activity. Similarly Whiting (2009a) writing about radiography students, identifies pressures on clinical environments such as rapid development in technology, increased workload and poor recruitment and retention as possible reasons. Factors found to facilitate research activity amongst consultant radiographers (Harris and Paterson, 2016) were skills, knowledge and having a well-defined research question; these may be factors to consider when teaching research skills to radiographers, for example

undergraduate students can struggle to formulate a research question, potentially wasting time which cannot be utilised in writing their time-limited proposal.

2.9 Making and interpreting images: The language of my practice

My interest in images runs through my professional practice as a radiographer and as an educator. Early in the development of this research, I realised that continuing this thread of imagery from my practice to my research was important to me as a practitioner. As I discuss later in the methodology chapter in Section 3.1.5 (starting on page 69), the early twentieth century art movement of cubism helped my paradigm shift from positivist to an acceptance of, and then a strong interest in, qualitative research. Although there is no firm evidence that the cubists were influenced by the then fairly new x-ray images, Henderson (1988) argues that it is likely that they would have been aware of them. For me the interest in cubist art is in the idea of looking at a two-dimensional image of something that exists in three dimensions. This resonates not only with medical imaging, where there is a 'flattening' of the body in plain radiography, but also with the concept of trying to understand other peoples' perspectives from my single viewpoint, and then trying to represent them in some way as research results. The earlier part of the movement has been named 'Analytical Cubism' (Cox, 2000). The artists, mainly Picasso and Braque, would analyse their subject and break it into conceptual blocks. They then reconstructed the subject by painting the constituent blocks from different perspectives.

When a reporter analyses a medical image, they are trying to see if there is a 'normal' appearance, or if they recognise anything as a variation from normal. In this research, my data will be in the form of words as well as images, to find out what 'normal' might look like in my research setting. For example, when thinking about the SCoR *Research Strategy* (Society and College of Radiographers, 2015a) I want to find out what 'embedded in the curriculum' looks like so I will be analysing my data and 'writing a report' on what I find. I am approaching the research question from various perspectives, as one might use different imaging modalities to answer a diagnostic question, but here the different perspectives will

be those of my participants. Some imaging modalities are better than others are at showing certain pathologies, just as different participants will, I hope, share different aspects of what is important to them.

2.9.1 How Barthes' theories 'struck' me as a way to look at images and data

A medical image captures the state of a patient's body at a moment in time, forming an image that will be looked at for the purpose of making a diagnosis. If a pathology is demonstrated, then the image may be used later in discussions with and about the patient to plan treatment. At a further distance from the original moment of capture, the images may be used in teaching, as I do in my practice, with no reference to or knowledge of the person behind the images. Some of Barthes' writing about photographic images is relevant to medical images in several ways. One of these is due to the similarity of capturing a never repeatable moment in a still image (Barthes, 1982) which applies equally to medical imaging as photographic imaging. Barthes calls this the 'what has been' (Barthes, 1982: 77), which equates to the moment in medical imaging when the patient, equipment and radiographer create the image. The image, which represents a single moment on time, lives on through time, to be looked at by whoever sees the image from then on, from someone who reports the image, to its use in clinical situations or teaching, long after the radiographer's original contact with the patient.

Barthes proposes three 'practices' to this process of image making: 'to do, to undergo, to look' (Barthes, 1982: 9). The person 'doing' or making the image is the one Barthes calls the operator, who in radiography is the radiographer them self. Interestingly the term operator is also that used for the person doing the act of exposing the patient to radiation by the UK *Ionising Radiation (Medical Exposure) Regulations (IR(ME)R)* (Gov.UK, 2017). The one 'undergoing' the imaging process is the patient, while the one who 'looks', Barthes calls the 'spectator' meaning anyone who looks at the image.

Another of Barthes' theories that has applications to medical imaging as well as photography is his suggestion there are two elements of a photograph or image that arouse interest. The first is an element of general interest in the image that he calls *studium*, which in medical imaging might be the general interest in looking at images as they are made, and as they are reported. I suggest this might be applicable mainly to the 'normal' appearance of an image, where 'normal' means in practice the absence of any pathology. The second type of interest is what Barthes suggests 'is this element which rises from the scene, shoots out of it like an arrow, and pierces me' (Barthes, 1982: 26). Barthes terms this element a *punctum*, suggesting that this part of the image, perhaps just a detail, metaphorically bruises one's body like a sharp point or tip. So, this is something within the image that piques the interest of the viewer and may have a physical effect on them, it 'animates' them (Barthes, 1982: 20), perhaps with a intake of breath or change in facial expression as they look at a pathology on a medical image even when they do not know the person whose image they are viewing.

Many writers in the field of photography have used Barthes' ideas of *studium* and *punctum* in relation to taking and viewing photographs, for example those in a volume edited by Batchen (2009). However, I have found only one writer who has applied these ideas to medical imaging. In an ethnography of a CT (computerised tomography) suite in America, Saunders (2010) suggests that a lesion, which may represent a pathology, plays the role of a *punctum* in a CT image. Hennlich (2011) later quotes Saunders and mentions the *studium* as well as the *punctum* in relation to medical images in his discussion of William Kentridge's film *History of the Main Complaint* but neither he nor Saunders develop Barthes' idea further.

In my own further development of the theory, I have drawn on Barthes' idea of the *punctum*, to show pictorially what the *puncta* were for me in the data I collected, that is in participants' drawings and interviews. As with Barthes' (1981) 'operator' who takes a photograph, or the radiographer operator who creates a medical image, the product, being the images and the interviews, could not have been made without the participants.

Bourdieu (1968) suggests that anyone looking at art will interpret what they see according to their previous experiences and knowledge as they decode and understand what they are seeing. A first or uninformed look by a viewer may lead them to see only a 'picture' of a form without understanding, but if the viewer has the ability born of previous knowledge about the conventions of art, or looking at art, and has some previous experience of doing this, in other words it is part of their habitus, then they will be able to interpret the image more fully. Therefore, looking at an image can be an aesthetic experience when the viewer sees an image and enjoys it without understanding the meaning or being moved by it, or the experience can be one of corporeal shock- a *puncta* that engages the interest. My Co-Constructed Depictions are an attempt to look at something together with my participants, to produce some useful interpretations between us.

Bourdieu gives the example of understanding the use of a pigment called ultramarine in fifteenth century paintings (Bourdieu, 1996). The contemporary viewer with their knowledge of the high cost of ultramarine knew that its use suggested that the client was rich, and that the ultramarine accents in the picture highlighted the most important parts of the image. To a modern viewer without this knowledge, the image may still have artistic or aesthetic appeal, but the contextual meanings are lost. Like Bourdieu's viewer of art, my first look at the data was like looking at a picture without understanding. I drew on the fifteenth century use of ultramarine purposely to identify *puncta* within an image by using colour to highlight what seemed important to me in my data. This process was partially guided by my interrogation of the data through the theoretical ideas I already had, and some *puncta* were identified because they stood out to me as I read them. My first instinct was to use colour to rank the themes, with gold and ultramarine used to show what I felt was most important, but I soon broke from fifteenth century art convention as I realised that ranking was not necessary or even possible within my themes.

Similarly, Barthes (1978) makes suggestions about the reading of a photograph which can be applied to reading a medical image, saying that the reading of the image depends on the

reader's knowledge of the signs which has previously been learned. Here I am the reader and my reading depends on my previous experience and knowledge. Barthes continues, saying that these readings are expressed using language which 'corresponds to a body of practices and techniques' (Barthes, 1978: 9). Drawing on Barthes' ideas in medical imaging this is the specialist body of knowledge used by radiographers and radiologists, consisting of the learned signifiers (the image) and the signified (the pathology). Together the signifier and signified form what Barthes calls the sign; in medicine, the same term denotes what is 'seen'. For example, a patient may have symptoms of a fracture that they can speak about, but a sign may take the form of a radiolucent line on an image (signifier) which is interpreted as a fracture (signified). In Co-Constructed Depiction, the participants speak about issues, making signs both written and spoken that I interpret and offer a meaning.

When reporting on a medical image the phrase 'has the appearance of' is often used. For example, I can say something looks like a tumour from its appearance but cannot say more about it, I cannot say 'this *is* a tumour', until further investigations are made, for example a biopsy, additional imaging or a second report by someone else. These results, being from a different perspective to the original investigation, may either agree or disagree with the original finding or diagnosis or may still be equivocal. As Magritte said about his painting of a pipe '*Ceci n'est pas une pipe (This is not a Pipe)'*:

> The famous pipe. How people reproached me for it! And yet, could you stuff my pipe? No, it's just a representation, is it not? So if I had written on my picture 'This is a pipe', I'd have been lying! — René Magritte (Torczyner et al., 1977: 118).

Similarly, the position I am taking regarding interpretation of my data is, in my own words: 'I think it looks like this to me, based on my prior experiences and pattern recognition, but the data is open to other interpretations and may be interpreted differently from different perspectives'. The data analysis and interpretation refer to other literature that helped shine a light on my findings from other perspectives thus adding to my analysis and interpretation.

This approach acknowledges the position of me as the researcher being entangled (Barad, 2007) in the research process and allows for the possibility of other interpretations.

2.10 Conclusion

Throughout the history of radiography there has been a desire to be seen as a profession which has prompted and been influenced by changes in education and healthcare. Research is an established part of the curriculum and is becoming more established in practice. Educators are engaging in and publishing research at a higher rate than clinical radiographers are, an uneven balance that the four-tier structure and four pillars of advanced clinical practice are aiming to address. My contribution to redressing the imbalance is this investigation into research pedagogy in radiography, and how radiography educators believe this can be accomplished, through an exploration of their perceptions about embedding research in the radiography curriculum.

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Chapter 3 Methodology

I chose to pursue a professional doctorate because the nature of this inquiry is an investigation of a professional matter: research and its pedagogy in radiography. My role as a lecturer has evolved into teaching research in lectures and as a research supervisor so I have chosen to investigate my research questions by asking those involved in research in radiography, as lecturers and students, to share their perceptions with me. As a radiographer, the importance of medical images in my clinical background, and as a teaching tool in my current role, have influenced my desire to use imagery throughout this research project.

This chapter will explain how and why I chose the methodology and methods for conducting the research based on my ontological position and the research questions I want to investigate. Following a discussion of my current position, I explain how I considered many qualitative methods and why I rejected them before arriving at the method I used to collect data. This developed from a desire to include imagery in both data collection and dissemination of the results, inspired by 'mapping' as described by Clarke (2017). I then discuss how I have developed my own method called Co-Constructed Depiction, to describe, analyse and interpret the data collected in a way that maintains a links between words and images.

Following this is a description and reflexive critique of the Pilot Study, which led to my chosen method for data collection and analysis. The last part of this chapter discusses in detail the data analysis methods used and the reasons why I felt they were best suited to my research questions while being congruent with my position.

3.1 Choosing a suitable method: Finding the water in which I can swim

As Bourdieu says, a researcher needs to be reflexive during the process so as to:

> …engage in the process of questioning with a command of the inevitable effects of that process. (Bourdieu, 1999: 608)

In other words, making clear who I am and how I am influencing the process by my presence. As I have explained in Section 1.4 (starting on page 6), a qualitative methodology suits this research as I am looking at how people understand research and radiography, and I acknowledge my entangled position within the research process. The next decision was choosing a method within this paradigm which best fitted my desire to use imagery within the research. There follows a brief critique of several methods I considered with reasons why each did not fit my needs exactly, and I illustrate where each has contributed to my development of Co-Constructed Depiction.

Bourdieu (1992) claims that reflexivity is necessary for individuals in practice in three ways. The first is in relation to social and cultural background, the second relates to an individual's place within a field and the third to 'intellectual bias'. These have implications for my role as researcher as I explain now. I am approaching the research as a radiography educator who is inviting input from participants from a range of backgrounds. While I am acknowledging my entangled position within this research, the effect of my position may be to influence participants to respond differently to me than they might with a different researcher. Secondly as a radiographer who now lectures in a university and has an interest in research, I fit within the field of radiography and a sub-field of education. Between any two fields there can be struggles for power, based on the symbolic capital held by individuals (Bourdieu and Wacquant, 1992). So, there may be unequal power balances to address with my participants and perhaps with people in a wider field of radiography pedagogy based on their perception of my own capital within the fields. Meanwhile my 'intellectual bias' oscillates between seeing my research problem as one to be contemplated during my expedition into a professional doctorate, perhaps as a self-indulgence, with one to offer useful understanding to be shared by the time I reach a destination. Throughout this thesis, I have been mindful of these issues and addressed them as they have arisen.

During my journey through doctoral studies, I have changed my own position from positivist to interpretivist as I described in Section 1.4 (starting on page 6). Mirroring my research

journey and paradigm shift, Pinnegar and Daynes (2007) suggest that a researcher's journey towards narrative enquiry, a qualitative method, goes through four stages in no particular order which I explain below. I feel this reflects my own journey, not specifically towards narrative enquiry, but towards my need to develop Co-Constructed Depiction. For me the first 'turn' was from a positivist paradigm to an interpretivist epistemology, which occurred during the guided learning part of the Professional Doctorate, when I was exposed to different ways of thinking to my scientific, positivist background as a radiographer. Concurrently, and with some difficulty at first, came an acceptance of words and images as well as numbers as data and an accompanying interest in the relationships between the researcher and participants. I came to realise that as the researcher, any attempt at eliminating bias in research is fraught with difficulty and in fact the researcher's entanglement (Barad, 2007) with the research is inevitable. My original positivist stance meant I was convinced that grand theories and generalisation from research findings were vitally important, but I now believe that there is much to be gained by knowing more about a specific research topic, and understanding more about situated issues in depth, even when grand theories or generalisations cannot be made. The outcome of these changes over the past few years have led me to want to explore in this research a localised social phenomenon in depth, and to put the data, in this case words and images, in the foreground of my findings while developing a methodology which turns away from my previous positivist stance.

As stated in my literature review, in diagnostic imaging, interpretation is dependent on the reporter, who looks at an image, and on the imaging modality chosen, as different modalities afford differing levels of sensitivity and specificity. Sensitivity is a measure of how well a pathology is seen and correctly recognised without missing the pathology when it was present- known as a 'false negative' result. Specificity means how certain the reporter is that there is no pathology, in other words the avoidance of reporting something that is not there- known as a 'false-positive' result. As I shine an investigative light through my research topic,

there is a risk, which I acknowledge, that my results may be prone to inaccuracies similar to sensitivity errors, since the participants will act as different modalities or perspectives, and I might miss seeing something either because participants do not make things clear, or through my misreading of their data. Specificity issues might arise from misinterpretation by myself as a reporter misunderstanding something in the data, or I might report something in my findings that the participants did not express. So, although my method and analysis are co-constructed, with the aim of depicting how my participants and I interpret the situation, I acknowledge my entanglement and influence in the process.

I next discuss several qualitative methods that I considered but found either unsuitable or only partially suitable for ontological reasons.

3.1.1 Grounded Theory

My preliminary intention was to collect and analyse data for this project using Grounded Theory, based on texts by Glaser and Strauss (1967), Corbin and Strauss (2008), Glaser (2017) and Urquhart (2013). The analysis process in Grounded Theory involves breaking down the gathered data using codes then attempting to rebuild these fragments back up into, eventually, a theory or theories. This method of breaking down and rebuilding is not suitable for my study for three reasons. The first is that while interview transcripts and drawings can be coded, I wanted to keep images and imagery as an integral part of the data collection and analysis. If these were medical images, they would not be 'coded' but read as a whole. This means that although the reporter might find something of interest to report on, they would look at the whole image as one, and link their reading of the image to the patient and the patient's medical history, thus writing a report that links the image and the patient's body, rather than an abstract note. I am replicating this by writing my analysis or report, while also presenting the images that were co-constructed. Secondly, and linked to the first reason, although in my chosen method there is a discussion and analysis of data in themes and I acknowledge my agency in choosing what is written about and how, I wanted to keep the authentic 'voice' of the participants, both written and as images, running through the

research as far as possible. This is not compatible with fragmentation of the data. Finally, I could not approach this research as a *tabula rasa* as suggested by Glaser and Strauss (1967) since I was purposely involving and entangling myself as the researcher within the data interpretation, with some ideas of what I want to find out about based on my experience and reading.

Charmaz (2006) discusses using Grounded Theory with a social constructivist perspective, advocating the foregrounding of participants and their 'views, feelings, intentions, and actions as well as the contexts and structures of their lives' (Charmaz, 2006: 14), which goes some way to bringing the voice of the participants into the research results. Charmaz therefore takes a step away from having the analysis procedure at the heart of the research to the acknowledgement and foregrounding of the participants and of the researcher as part of the research process, accepting that the position of researcher as a *tabula rasa* is a difficult, if not a 'naïve' view (Charmaz, 2006: 165). However, her constructivist method still advocates analysis of the data by coding, as she says, 'Our codes show how we select, separate, and sort data to begin an analytic accounting of them' (Charmaz, 2006: 45).

Looking for a way to reconcile my first intentions to use Grounded Theory methods with my aims of keeping authentic voices from participants and concurrently acknowledging my entanglement in the project, I next considered Clarke's (2005; 2017) work which develops Grounded Theory into a method she names 'Situational Analysis' (SA). Clarke (2005; 2017) makes the case that Situational Analysis offers an even more interpretive stance than Charmaz (2003) in Grounded Theory method by de-centring the human actors and including other elements such as computers or data collection instruments in the analysis. The first book, from 2005, emphasised how Clarke felt that her version of Grounded Theory was round the postmodern turn, which she dates to the mid to late twentieth century, because the nonhuman elements are considered in the method. In a profession like radiography in which the human, equipment and image entwine, this notion of including the nonhuman in the research resonated with me. As a researcher I am interested in the influences on why and

how we teach research, which also includes the influence of nonhumans, for example policies and directives which assume agency in their interactions with us (Barad, 2007). However, Clarke's data analysis method still, like Grounded Theory, relies on coding the data collected. While Clarke's second book from 2017 goes some way to integrating new theories into the method of SA, it reads more as a justification for the method having a new name or new position, rather than how the method is essentially interpretive. One of the justifications Clarke claims is there are 'always already' interpretive properties of GT and SA (Clarke et al., 2017: 25), so if GT is already interpretive, it is not clear how SA differs in its theoretical stance. Indeed, the basic methods of data analysis are unchanged from the first book, as they still rely on coding the data and this use of coding is something I could not reconcile with my position and approach. Clarke says of situational analysis: 'While SA fully engages individual materials, that is not its main focus (p 13)'. This is in opposition to my stance that individual materials, of which Clarke gives the example of individual voice, are indeed the focus of my research, with the role of nonhuman elements being considered as part of the research, not the focus.

However, although Clarke's (2017) description of Situational Analysis methods has resulted in my rejection of her method for this study, her mapping ideas for data analysis encouraged me in my aims to use mapping and imaging techniques, not only for data analysis as Clarke does, but for data gathering too. I discuss this development further in Section 3.2.2 (starting on page 76).

3.1.2 Phenomenology

Creswell (2018) describes how in phenomenology the researchers distance themselves from the study. Moustakas (1994) talks of the 'epoché', a word meaning suspension of judgement and used to describe how researchers should enter the research only after:

> …we set aside our prejudgements, biases and preconceived ideas about things (Moustakas, 1994: 85).

In a similar way to attempting to approach Grounded Theory method as a *tabula rasa*, this act of distancing oneself as a researcher from that being researched is at odds with my belief that the researcher is, whether or not they acknowledge it, firmly situated within the research process. Moustakas (1994) uses positivistic terms in relation to phenomenological research, such as 'deriving scientific evidence' (Moustakas, 1994: 103) which, in some ways similar to Grounded Theory method, feels an uneasy justification of the method because of its similarity to positivist scientific research. Further, the data analysis has similarities to Grounded Theory, as there are systematic procedures for analysing the data collected by breaking it into units; an analysis method I have already suggested is not appropriate for my research.

Phenomenology investigates the human experience, and for this research that would be the experience of teaching or of learning about research. But my study goes further, to investigate not only the experience, but what shapes that experience, and the nonhuman factors that are involved, to attempt to 'understand how matter matters' (Barad, 2003: 203) in this study.

3.1.3 Case Study

Thomas (2015) suggests that performing a case study allows a detailed investigation of a particular boundaried phenomenon which is not considered generalizable outside the particular case. In my research, case study method could truly embrace the human and nonhuman elements under investigation by using multiple sources of information (Creswell and Poth, 2018).

Meanwhile, Yin (2014) suggests that case study method is suitable when three situations are present. The first is that the research intends to address a descriptive question. Here I want to find out about what is happening in research pedagogy in radiography and describe what I find. The second is looking at a phenomenon in its setting, rather than gathering more distant data, for example with a mass survey. My participants are involved in the

phenomenon, which is teaching research in one HEI, and I could look at it from my perspective as a participant observer. Yin continues that the third reason to use case study method is that it is becoming more accepted as a method of evaluation although unfortunately he only puts forward his own studies as proof of this, numerous though they are.

Yin's arguments against case study method include a lack of acceptance of the method due to a perceived lack of rigour and credibility, bias and generalisability. These seem to be arguments from positivist standpoints against qualitative research in general. Two thoughts arise from Yin's position. First, he discusses validity and rigour in a way that suggests he feels that, although qualitative in nature, case study research suffers by not being generalisable. Secondly, his argument is to promote this method *because* it can be compared favourably as a research method against more positivist methods rather than seeing its authenticity as a strong qualitative method in itself. However, my perspective on qualitative research is to reject positivist emulation as a good reason for choosing a method, and instead to embrace a qualitative research method as a justifiable method in itself, and as one which offers description and understanding as its outcomes.

3.1.4 Narrative

Turning now to narrative enquiry, I discuss how narrative methods helped in the development of Co-Constructed Depiction. Creswell (2018) suggests that narrative research can be used to describe either a narrative or story told by the participants, or as an analysis method. Here I use the second meaning, by which information gathered from participants will be depicted as a pictorial and written 'story' (Riessman, 2007: 6). Acknowledging that the term 'narrative' has many meanings, Riessman (2007) suggests that a narrative in research is an oral storytelling, usually told about events which are important to the storyteller, in a chronological order. However, in this research I am not using narrative as a chronological story *about* something but as a situated story, or report, *of* something. In this case, I am

making a depiction of the participants' answers to the interview questions and drawings that are based on participants' answers to the research questions and my interpretation of them.

In a discussion of thematic analysis, Riessman (2007) uses Gee's (1991) method of transcription to show how a narrative can be organised into sections, each of which can be given a title or theme. The narrative is not disrupted by cutting and reassembling in a way that coding might:

> … [in an] attempt to keep the 'story' intact for interpretive purposes…(Riessman, 2007: 74)

Although this method of analysis avoids coding, it also excludes the interviewer's voice from the analysis in the written format and so hides the interviewer and the notion of co-construction of the narrative. But just like Barthes' (1981) 'operator' who takes a photograph, I am involved with the participants in my research, since the operator, or researcher 'limits, frames, and perspectivizes when he *(sic)* wants to "take"' (Barthes, 1982: 10). I cannot ignore this entanglement and while my voice does not appear in my depictions, they are co-constructed due to my involvement; from the questions I asked to the way I used the data to co-construct the depictions. In medical imaging this might be seen as a particular style, for example the radiographer who always annotates or frames an image in a particular way means the identification of the radiographer is possible when consulting the imaging records later. Similarly, I will have a different style to other researchers, even one who might replicate my work, which I acknowledge as my entanglement (Barad, 2007) in the process.

3.1.5 Imagery

Using imagery in narrative enquiry is not a new idea, as it has been used by authors such as De Mello (2007), who discusses her use of art combined with a narrative of her experiences as a teacher in producing and understanding research. She used art for both the data-gathering process and as part of the analysis. De Mello suggests that there are two strands within the theme of art and narrative enquiry. The first is arts-based research in which the 'art' forms part of the data gathering process, for example using images to elicit responses,

as used by McNiff (2008) and Finley (2008). Meanwhile, arts-informed research uses ‘art’ in the analysis of the data gathered, for example the use of an author’s poems in the text. Using these two definitions, this project will be both arts-based, as I am asking participants to draw and discuss their own primary images, and arts-informed as the description and analysis will present images as part of the results.

I considered various ways of using imagery to collect data, including asking participants to draw images before discussion in interviews, rather than during interviews. Bach (2007) talks about composing a visual narrative using photographs, suggesting they add a layer of meaning to the enquiry by helping the participant to share their story, which is one of my reasons for using imagery during the interview. However, whereas photographs may be taken over a period of time then used to elicit responses and narratives during an interview, I wanted my participants to create their images during the interviews, adding imagery as a dynamic layer in the narratives of their experiences. If my participants had been encouraged to make their images before the interview, there was the possibility that they could research what they thought was the correct or expected answer, rather than having the opportunity to create spontaneous, contemporaneous images during the interview (Prosser and Loxley, 2008). I intended this approach to give me an insight into participants thought processes and revisions as they spoke and drew rather than a rehearsed response that might not reflect the everyday situatedness of their thoughts and actions. I was keen to capture what is happening and being thought about day to day, rather than what participants might think they should or could be doing while acknowledging that answers may be influenced by my presence as their audience and a researcher. In addition, while I hope my work will ignite discussion around my questions outside the data gathering arena, I hoped to capture individuals’ thoughts before general discussions happened. For example, I did not want any participants to feel they could not raise issues because others have advised them not to, or to raise issues based on other people’s responses to the questions. I am particularly sensitive to these issues as I could be perceived as a knowledgeable insider who, they may

feel, is out to trap or judge them, and hoped instead that I might be seen as *one of us* in my role as a radiography practitioner and educator.

As Riessman (2007) suggests, narrative is not only defined as the stories told by participants but can be the way the researcher constructs a narrative from the data. I have mentioned Cubism which was an attempt, led by Picasso and Braque (Cox, 2000) to visualise different perspectives of three-dimensional objects on a flat surface. This research tries to visualise different people's perspectives on the research questions by creating a visual narrative using their data, words and images, that is, creating two-dimensional depictions of multidimensional perspectives. This becomes a depiction of a story co-constructed with the participants; just like cubism and medical imaging, creating a two-dimensional artefact for dissemination from multi-dimensional perspectives. One definition of curate is to 'select, organize, and look after the items in a collection or exhibition' (Oxford Dictionaries 2016). I see my task as the researcher being to select and organise the data collected to create a narrative, while 'looking after' the data by keeping it intact and being reflexive when using it.

3.1.6 Thematic Analysis

When reporting a medical image, the reporter is engaged in pattern recognition, looking for appearances in the image that match what, in their previous experience and knowledge, represent abnormalities. I had images in my data to look at and noted the *puncta* (Barthes, 1982) that stood out to me, the details that 'pierce[s] me' (Barthes, 1982: 26), that struck me as important, and searched for patterns that represented the themes I was looking for based on my research questions and theoretical framework.

In the analysis I used what Braun and Clarke (2013) describe as *theoretical* thematic analysis, which uses existing theories and concepts, based on choices I made as a result of my own knowledge and epistemology. However, there was still flexibility in my analysis as I stayed open to ideas and concepts which the participants suggested and which I had not

previously considered. This method will be discussed in more detail in Chapter 4 Data description and analysis (starting on page 99).

3.1.7 Examining the images

Pink (2007) argues for a reflexive approach to analysis of visual research data. Although she is discussing photographic and video data, in the context of ethnography, I felt that the drawings generated by my participants were of equal value to electronically enabled data such as photographs, since they were created contemporaneously and by the participant themselves during interviews. Similarly, Rose (2016) suggests that images are used actively as part of the data collected and analysed. In my data gathering process, the participants used their bodies and mark making tools to make their drawings. Pink (2007) further suggests that visual knowledge should not be simply translated into verbal, or written, knowledge during analysis, but should be analysed together and then presented together to form a whole. This intention to maintain the data as a whole is also evident in Riessman's (2007) discussion of narrative data, when she highlights one of the differences between thematic analysis and Grounded Theory as:

> …keeping a story 'intact' by theorizing from the case rather than from component themes (categories) across cases (Riessman, 2007: 53).

In other words, this method of thematic analysis of data avoids the *cutting up* process and allows the participants voices to be maintained in both written and pictorial form. Using thematic analysis on my findings meant the depiction of my results included and foregrounded the participants' own words and images together, before considering themes individually.

3.1.8 Conclusion

In this section, I have discussed different qualitative methods that I considered might be suitable for my research, but conclude that while methods such as Grounded Theory, phenomenology and case study have their place in research, none of them was suitable for my project due to their dissonance with my ontological and epistemological position. These

reasons include my unwillingness and inability to distance myself from the research as both a practitioner researcher, and due to my belief that researchers are entangled in the phenomena they are researching. Secondly, the practice of chopping up data that is central to analysis in Grounded Theory and thematic analysis actively works against the idea of looking at a whole picture and the concept of maintaining the voice of participants that I think is important in understanding the contextual factors that may have a strong bearing on answers to my research questions. Finally, having made a turn from positivist to interpretivist, I am reluctant to engage with a qualitative method which seeks to gain approbation through its emulation of positivist methods. Instead I want to explore a qualitative methodology which pushes analysis beyond coding while acknowledging my entanglement and the presence of the nonhuman but preserves the presence of individuals and their contribution.

To overcome my perception of the shortcomings of other research methods, I have developed Co-Constructed Depiction for this study, a method focussing on understanding what is in the data by shining an analytical beam through the data to find meanings. Co-Constructed Depiction starts by depicting in word and image each participant's ideas and concepts as a whole. I next discuss how I developed this method, having viewed other methods with a radiographer's gaze.

3.2 Development of Co-Constructed Depiction (CCD)

My visual knowledge as a radiographer is formed by medical images that are interpreted to give a written report of what was seen. In this research, my visual knowledge was the participants' drawings and while some translation into written knowledge was done in my analysis and discussion, I believe that the participants' drawings should be part of the presentation of results. In the written part or report of my results, I use direct quotations from participants in the same way they are used to illustrate other qualitative research. This approach reflects practice in medical imaging where the image and report co-create the findings. Therefore, I agree with Pink when she suggests that:

> …while images should not necessarily replace words as the dominant mode of research or representation, they should be regarded as an equally meaningful element of ethnographic work (Pink, 2007: 3).

Although mine is not an ethnographic study, what Pink says suggested an opening for me to include both written and visual depiction in my research.

I acknowledge that there are tensions in how I explain the data gathered, since it is a representation of participants' thoughts and feelings, which is open to my interpretation which itself is influenced by my habitus. A radiograph is an image representing a person and possibly disease, at the time the image was made. However, the image is itself only a representation of something that is open to interpretation. For example, Burri says of medical images:

> Images are unclear and can be misunderstood; they leave space for heterogeneous interpretations. In the daily routine, this leads to many discussions about what images really depict (Burri, 2012: 51).

As Barthes (1978) suggests, the reading of an image depends on the reader's knowledge of the signs which have previously been learned, so my reading of my data depend on my previous experience and knowledge. In Co-Constructed Depiction, the participants speak about issues, making signs both written and spoken that I interpret and offer a meaning.

It follows that although the image and the report are closely linked for any particular patient and stand together at that moment of time, they exist as an *interpretation* in that moment dependent upon the imaging technology and techniques used, and the way the image was understood or read by someone for the report. As Dally said, in the early days of medical imaging, but still relevant today:

> …a good radiograph in some respects may be said to resemble a painting by Turner. Without intuition or previous study the one is almost as incomprehensible as the other, but as we gaze the wealth of detail rises before our vision until finally we are able to interpret the meaning of streaks and shadows that to the untrained eye are meaningless. (Dally 1903: 1806, in Pasveer, 1989).

3.2.1 Exploration of the analogies between reporting images and reporting qualitative data results

I will now explicate the parallels between the way a medical imaging report is written and how qualitative data can be analysed which further strengthens the analogy between reporting images in clinical practice and how I will report on Co-Constructed Depictions. While reviewing an image the reporter writes about what they believe they are seeing. Piper, in research on radiographers reporting chest x-ray images states that:

> For the abnormal cases the student was expected to provide brief key details on the abnormal radiographic appearances and include suggested pathology/ies where applicable, in the form of a free text hand-written report (Piper et al., 2014: 95).

This means that reports on radiographic appearances are expected to have two main parts: firstly, details of the appearances seen and secondly, what the appearances suggested, with additional credit given when the radiographer made further recommendations for example suggesting further imaging.

Similarly, in The Royal College of Radiologists (RCR) *Standards for the Reporting and Interpretation of Imaging Investigations* (2006) (updated 2015) there is an expectation that reporters will perform an observation of the image and make a note of any findings. In the analysis phase further evaluation of the findings are made in an effort to decide whether they are significant and thus what the diagnosis may be. The interpretation is made by drawing on previous experience and knowledge to decide the relevance of the findings to the patient in the study, for example, to suggest what disease process could be responsible for the findings in this particular patient. The RCR suggests that:

> Taken together, these factors will allow a clinically relevant opinion to be given that encompasses all the known factors about the patient, as well as the imaging findings (The Royal College of Radiologists, 2006: 8).

In short, these three phases might be called observation (findings), analysis (are findings significant?), and interpretation (what do they mean?). Meanwhile Wolcott (1994) similarly

suggests that qualitative data can undergo three similar processes: description, analysis, and interpretation.

Table 3:1, below, places two reporting methods, those of Piper (2014) and the RCR (2006) alongside Wolcott's (1994) suggestions for qualitative data analysis. In the last column on the right are the processes I used to look through my data, based on the similarities found between reporting medical images and analysing qualitative data.

Table 3:1 Comparison of data analysis flows through three stages from different sources

Source	Piper *et al.* (2014) Chest reporting by radiographers	The Royal College of Radiologists (2006) Standards	Wolcott (1994) Transforming qualitative data: description`, analysis`, and interpretation	This Thesis
Type of analysis process	Radiographer reporting	Radiologist reporting	Qualitative research	Practitioner researcher
Data	Medical image	Medical image	Qualitative data	Co-constructed Depictions
Stage 1	Appearances	Observation (findings)	Description	Description of appearances in words and images
Stage 2	Pathologies- what do the findings suggest?	Analysis	Analysis	Analysis
Stage 3	Recommendations	Interpretation	Interpretation	Interpretation and Recommendations

Taking account of the text and table above, I believe that treating the data, the images and words from each participant can include the same stages as writing an imaging report- description, analysis, interpretation and recommendations and that is the format this thesis employs.

3.2.2 Data analysis: Developing Co-Constructed Depiction for analysis

This section describes the data analysis methods in detail, explaining why I have chosen these methods. The data collected was in the form of interview audio recordings that were transcribed, drawings made during interviews and notes made during the interviews by me.

I explored themes depicted in the spoken and drawn data to add to the body of knowledge in an area of study not previously researched in depth, and look for themes, ideas, similarities and differences that I could use to understand the perceived position of research in radiography that might help me build a better pedagogical framework. Analysis by more than one researcher could help increase reliability of the results but this study acknowledges the researcher as an entangled participant in the data collection and analysis which could be diluted or differently interpreted by someone else (Cohen et al., 2011). Urquhart (2013) acknowledges that it is difficult not to impose one's influences on data when talking about coding for Grounded Theory but suggests that the researcher has an open mind when coding. This is not my aim as I acknowledge that my previous experiences and reading would influence my analysis but the thread of reflexivity throughout the study will help to identify what are my thoughts, and what thoughts originated with the participants in this Co-Constructed Depiction. Therefore, I based my analysis on my interpretation of the participants' understanding of the research questions.

Clarke's (2017) situational maps and analysis influenced my thinking about the data analysis techniques to use, even though as I explained in Section 3.1.1 (starting on page 64), I rejected her methods for my analysis. Clarke suggests that situational mapping techniques, where the researcher them self makes maps after data collection can:

> …help researchers think about the kinds of collective, organisational and institutional elements in their projects (Clarke et al., 2017: 174).

However, in a departure from Clarke's method, I chose to ask participants to draw their own maps, which were drawings rather than maps, which I then analysed.

Figure 3:1, overleaf, represents the first stage in Clarke's (2017) situational analysis process. She suggests that all elements, human and nonhuman, revealed by the study should be placed randomly on the map to give an overview. Each element is then thought about in turn, to discern the nature of its relationship to the other elements. While I did not use this method to analyse the data, it helped me to understand the complexities in this field and to

see if any expected data was missing, compared to what I thought might be important when I analysed the data.

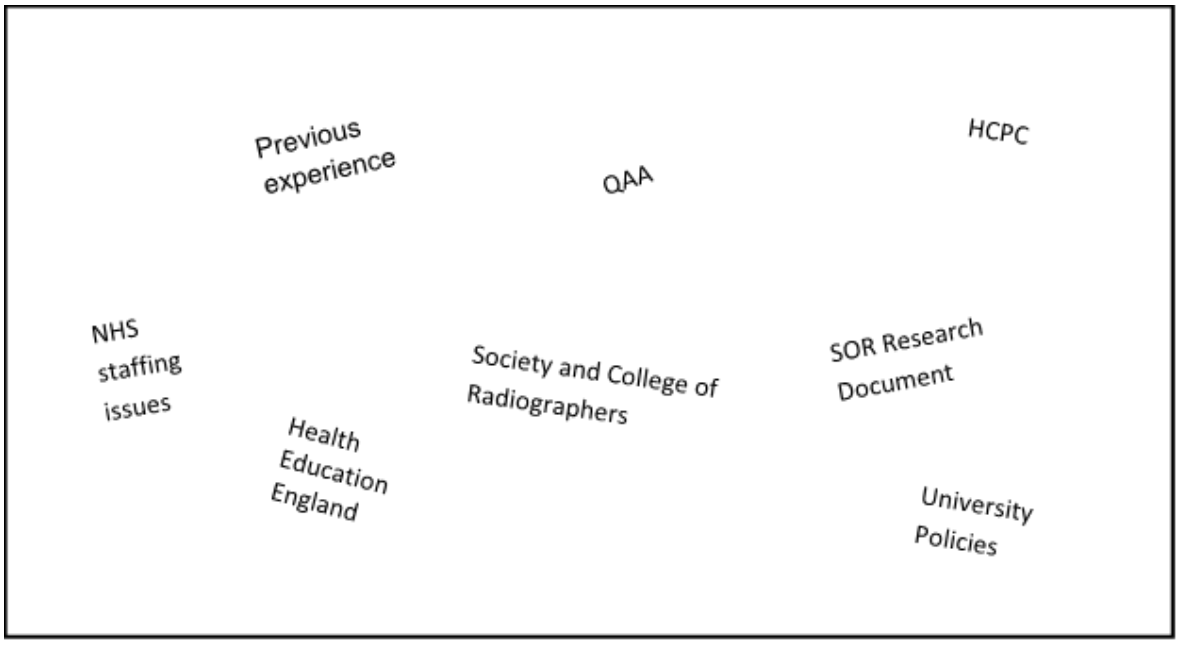

Figure 3:1 Example of Initial Abstract Situational Map: Messy/Working Version

The next stage suggested by Clarke (2017) is to take the elements from the initial messy map and form an Ordered/Working map using categories such as *Political elements* and *Temporal Elements*. This again is where my method departs from Clarke's suggestions, as there is an implication that at this stage the data starts to be chopped up rather than viewed as a whole as happens when looking at a diagnostic medical image. Data is also supposed to be ordered in a way that Clarke suggests, rather than how I, or any other researcher, might interpret it. However, Clarke's (2017) next step is to draw a concept map of social worlds, arenas and items which shows pictorially the place and relationship of different influences on a situation, as in Figure 3:2 opposite. As explained before, while I am not using this as an analysis tool in the way Clarke does, this image gave me the idea to ask participants to draw their own understanding of influences and ideas during interviews.

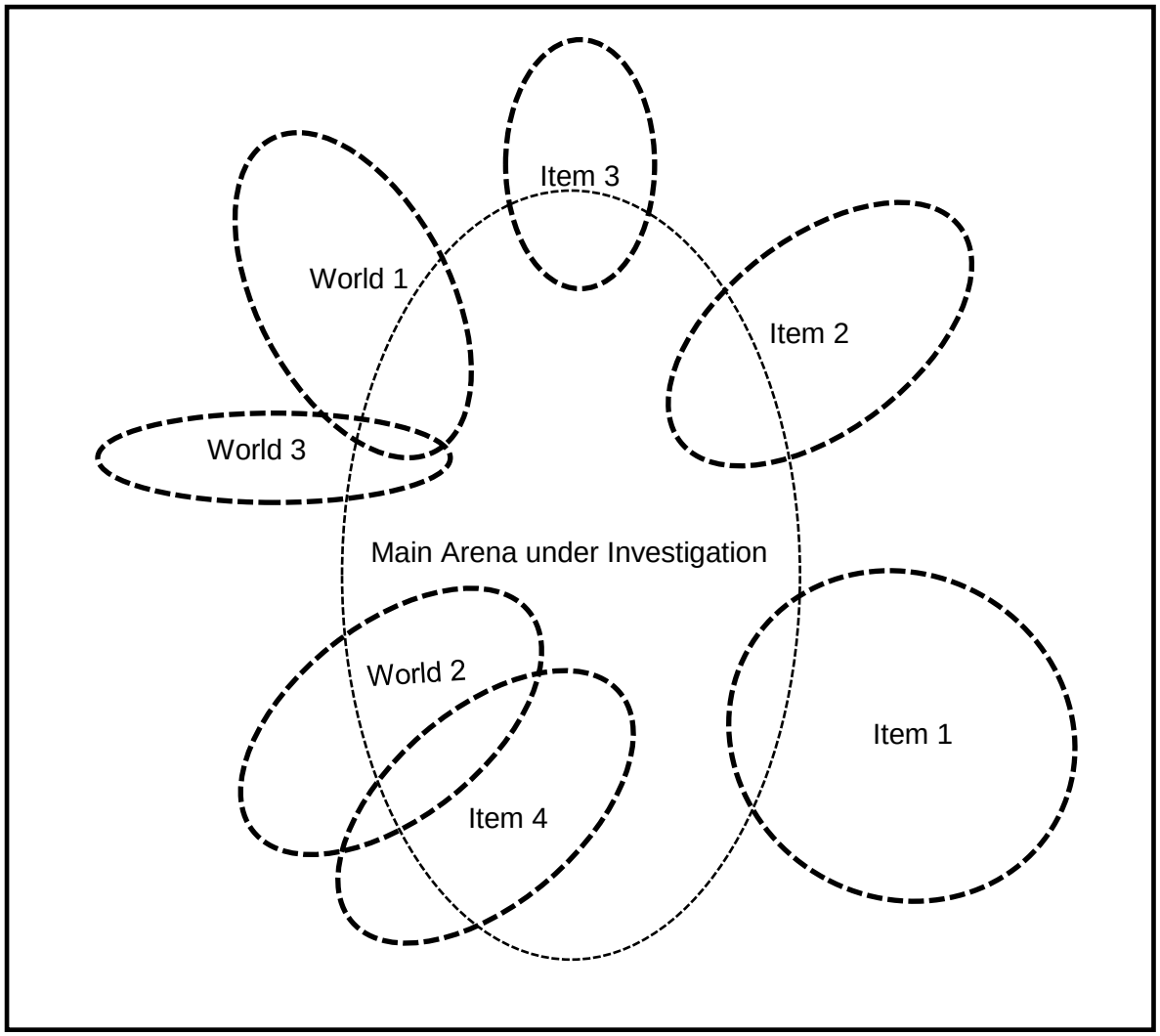

Figure 3:2 Example of Social World/Arena Map

3.2.3 My entanglement in Co-Constructed Depiction

I am using my term 'Co-Constructed Depiction' to put forward in one expression the way I am using my participants' data and my interpretation of it to show the results in pictorial and narrative forms. In Grounded Theory method, the theories proposed are said to be *grounded* in the data. However, for this study I suggest that while the findings are themselves grounded in the data, Co-constructed Depiction method avoids cutting up the data into fragments, reformed to make a simulacrum or a reconstituted piece. Secondly, both Law (2004) and Barad (2007) suggest that the methods used to make discoveries in research

influence the discoveries made, the same way choice of technology and technique influence a medical image. Law (2004: 45) argues that methods 'participate in the *enactment* of those realities' (emphasis in the original text) rather than just discovering realities. Similarly, Barad (2007) uses the term entanglement to describe how a measuring apparatus affects the phenomenon it measures, whether that is an item of laboratory equipment, or a human agent making decisions in the examination of a phenomenon, or I suggest a combination of human decisions and machine type in medical imaging technology. This means that the data gathered is entangled in the method. As the researcher, I am both a human agent making decisions about what is done and how, and I am also the interpreter of the data. The method, participants' data and I are entangled in each other in this research, each dependent on the other, hence the use of the term Co-Constructed Depiction for my method.

3.3 Putting Co-Constructed Depiction to work

3.3.1 Pilot study

A pilot study trialled the interviewing method with one participant to ensure that the questions used were appropriate and that the participant understood the drawing techniques (described below). The participant did not make bubble diagrams as I had expected but produced mind-map type images. This challenged my original ideas about analysing and displaying the drawn data, but the images produced did, as expected, enhance the spoken data by showing what the participant felt was important. Piloting also gave me an opportunity to check the practical aspects such as the use of recording instruments and the suitability of the location chosen for the interview. There were issues with external noise, but as this noise was from temporary building work, I did not expect it to be an ongoing issue. The interview and drawing were divided into three phases:

DRAWING 1 Question What do you feel are the influences on how we teach radiography at Midlands University, current and historical? – (During which the participant made DRAWING 1)

DRAWING 2 Question What about influences on teaching research at Midlands University? - (During which the participant made DRAWING 2)

DRAWING 3 Question (How) do you think we embed research in the whole curriculum? - (During which the participant made DRAWING 3)

All three drawings made by the participant are available to view in Appendix A: Pilot Study Drawings.

Several other issues became apparent during the pilot interview that I had not thought about previously. For example, the pilot participant used A1 (841 x 594 mm) size paper with no guide image in the centre. This gave them plenty of room to draw and write but it was difficult to use without having a large table and the participant needed to stand up to complete the drawing, which resulted in some damage to the paper. The finished drawings resembled mind map drawings rather than bubble drawing, which was the format I needed for the analysis I have developed. Therefore, although I did not want to lead my participants, I decided to show future participants an image (as shown in Figure 3:3 overleaf) to show the *type* of drawing I was hoping for, without giving rigid guidelines and rules. I also decided to use smaller paper, A3 (420 x 297mm), for ease of use by participants. I added the skeleton outline in the middle of each page and this identification of the head and foot of the paper was designed to allow participants to rank their answers. In practice, this did not always work as they thought and drew spontaneously, and I did not want to affect their answers by giving further direction.

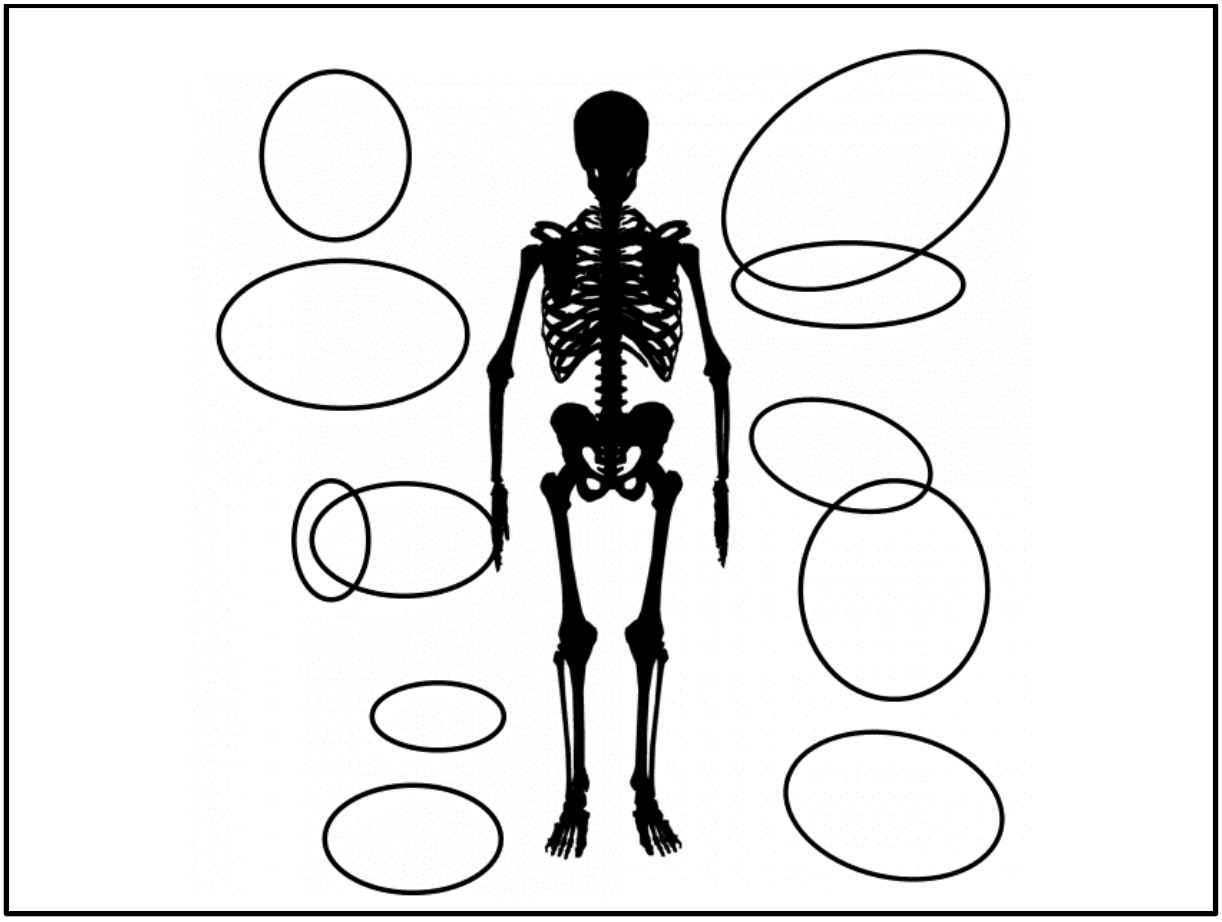

Figure 3:3 Drawing Information Diagram for Participants

In conclusion, the first iteration of my method of interviewing, although stuttering in places due to my inexperience and nervousness, did elicit the type and range of answers I expected. The drawings were not how I expected them to be rendered so I showed future participants a version of a drawing with bubbles drawn, but without any text, to explain the format I was expecting. I hoped this would also help alleviate any fears about drawing as an art form and help participants to organise their drawing based on the skeleton scaffold (see Figure 3:3). This way I could analyse the text and the drawings and look for themes within different participant groups. I was concerned that giving participants diagrams to explain what I was asking them to do may have become prescriptive and curtail their creativity. However, I needed some consistency so my analysis techniques could be used effectively.

In short, I used a semi-structured interview based on a set of pre-designed questions, complemented by a semi-structured drawing process, based on a suggested format.

3.3.2 Main Research Study

Informed by the pilot study, I made some changes to my method as outlined above. I now explain in further detail the steps taken to undertake the main data gathering and analysis phases of Co-Constructed Depiction.

3.3.2.1 Sample

This interpretive study did not intend to subject data to statistical analysis, thus a non-probability theoretical sampling method was indicated (Cohen et al., 2011). I used purposive sampling to invite participants who fell within the inclusion criteria to take part in interviews as they have knowledge of the issues I am exploring. The sample size depended on availability of staff, students, and time so it was difficult to be precise about the number of participants that may be included before I started.

3.3.2.2 Inclusion and exclusion criteria

Inclusion criteria:

1. Academic staff working in the Radiography Department at Midlands University who are willing to participate in the study

2. Third year undergraduate radiography students at Midlands University who are willing to participate in the study

3. Postgraduate radiography students at Midlands University who are willing to participate in the study

Exclusion criteria:

1. Staff who do not work as academics in the Radiography Department at Midlands University

2. Students who are not currently on courses in the Department of Radiography at Midlands University

My sample was small but drawn from the population of staff and students in Midlands University involved in research pedagogy in radiography. When choosing participants from those who agreed to be involved in the research, I tried to match the demographic background of each individual group, staff and students to address possible inclusion and diversity issues. I was delighted that 18 participants were willing to participate in the research with me. They included five undergraduate students (Students), four postgraduate students (PG Students) and nine members of staff (Staff) from the Department of Radiography at the university. Further details of the participants are shown opposite in Table 3:2 Details of participants in the research project

Table 3:2 Details of participants in the research project

Participant number	Pseudonym	Type	Research experience
1	P1 Student	3rd year undergraduate student	No previous research experience before joining this course
2	P2 Student	3rd year undergraduate student	Aware of research from other peoples' activity before joining this course
3	P3 Staff	Academic staff Qualified for 18 years, academic for 15 years.	Holds MSc. Research active. Student research supervisor
4	P4 Staff	Academic staff Qualified for 17 years, academic for 14 years.	Research active as doctoral student Student research supervisor
5	P5 Staff	Academic staff Qualified for 20 years, academic for 10 years	Research active as doctoral student
6	P6 Staff	Academic staff Qualified for 19 years, academic for 13 years	Holds MSc. Student research supervisor
7	P7 Staff	Academic staff Qualified for 23 years, academic for 17 years	Research active as doctoral student Student research supervisor
8	P8 Staff	Academic staff Qualified for 35 years, academic for 14 years	Holds M.Ed. Research active.
9	P9 Staff	Academic staff Qualified for 20 years, academic for 13 years	Research active as MSc. student Student research supervisor
10	P10 PG Student	Clinical staff and Postgraduate student Qualified for 27 years	Research active as MSc. student Has done research for BSc dissertation
11	P11 Student	3rd year undergraduate student	No previous research experience before joining this course

12	P12 Student	3rd year undergraduate student	Aware of and had written about EBP before joining this course
13	P13 PG Student	Clinical staff and Postgraduate student Qualified for 10 years	Research active as MSc. student Has done research for BSc dissertation previously
14	P14 PG Student	Clinical staff and Postgraduate student Qualified for 27 years	Research active as MSc. student Has done PGDip.
15	Did not take part after original contact		
16	P16 PG Student	Clinical staff and Postgraduate student Qualified for 21 years	Research active as MSc. student Has done PGDip.
17	Did not take part after original contact		
18	Did not take part after original contact		
19	P19 Student	3rd year undergraduate student	Aware of and had written about EBP before joining this course
20	P20 Staff	Academic staff Qualified for 26 years, academic for 17 years	Research active Student research supervisor
21	P21 Staff	Academic staff Qualified for 30 years, academic for 1 year	Research active Holds MSc.

While it was not my intention to generalise my findings to the general population, it was possible to observe trends, themes (Braun and Clarke, 2013), and ‘categories’ or ‘general concepts’ (Riessman, 2007: 13) within the group of my participants themselves. I looked for

themes, similarities and differences between groups and individuals to see if they could shine further light on answers to the research questions. This is how I used thematic analysis in the context of Co-Constructed Depiction, not following cutting up of the data, but rather following a more penetrating look through the data, noticing were the *puncta* for me and narrating these thematically.

3.3.2.3 Data Collection: Interviews and participant drawings

Following granting of ethical approval, I sent invitations to participate accompanied by an information sheet (Appendix B: Participant Information Leaflet) and consent form (Appendix C: Participant Consent Form) by email to potential participants, with a request for confidentiality about receiving an invitation and their participation. I asked participants to give their consent to being involved in the research both in writing in advance of the interview, and as part of the audio recording, making it clear that they could withdraw at any point without prejudice or penalty.

A semi-structured interview format lasting approximately one hour (Gillham, 2005) was used to elicit responses using open-ended and non-leading questions (King and Horrocks, 2010), (Appendix D: Interview Guide) during which I had the opportunity to probe for more depth and clarification of the answers given. Emmel (2008) advocates using participatory mapping to help gain insights into how people understand a situation as they move from oral description to drawing and then analysis and discussion of the images they have drawn during the interview. In this research project, I asked participants to draw as well as use words in their version of a map to tell how they see themselves and the issues under discussion in the context of the research questions posed. My aim was that participants' drawings would help to promote discussion to explore their experiences, opinions, and feelings in relation to the issues surrounding research and research pedagogy in radiography. I encouraged participants to talk about the drawings they were making either as they were drawing, or in gaps between drawing, to capture their thoughts in words as well as

images. The interviews were recorded and subsequently transcribed so participants' comments could be added to their drawings, forming the Co-Constructed Depictions.

Emmel (2008) suggests giving participants an explanation about a week before the interview to give them time to plan how they might compose the drawing. A disadvantage of this is that it may be difficult to capture thought processes and explanations if the participant makes a drawing from memory once in the interview. However, from the pilot study, I found that some explanation in advance could help relieve participants' anxiety about having to produce what might be perceived to be art, and further information explained the type of diagrams I was expecting to help me with analysis of the data. I expected that the exact questions asked might have evolved as participants revealed concepts that emerged from the interview and drawing process, but I asked all participants the same questions, and only the prompts changed. All interviews were audio-recorded and later transcribed, and I made a few accompanying notes during the interviews. After the interviews, I made digital copies of the drawings for analysis as explained in Section 4.2 (starting on page 99).

An advantage of this dual method is that there are both oral and visual materials to analyse and it was possible to cross match the two for each person, thus adding some internal validity to the findings. I anticipated that some participants may talk and draw at the same time, while others may either talk or draw first and I needed to encourage them to either draw what they were thinking about or talk through their drawings to ensure I gathered as much data as possible in the two forms. Since there is a tangible record of the interview, if ideas later needed clarification or elucidation, the participant and I could have used the drawings as an aide-memoire and any added ideas, if done in different colours, could show developments in thought processes. In practice, no participants asked to read their transcript or add any data to the drawings when offered this opportunity.

Choosing individual rather than group interviews or focus groups allows participants to speak more freely than they might in front of others, where there may be perceived differences of

power within the group. During separate interviews, the drawings will be the work of an individual, not a group, so the differences and similarities can be seen between participants rather than consensus or majority perceptions which could happen in a group interview (Cohen et al., 2011).

Following the pilot study, I revised the interview questions related to the drawings. I removed the first question which had asked about teaching radiography in general and replaced it with a question which focuses on asking about influences on *why* we teach research to radiographers as this had become an important question for me, following more reading on professions. The second question was changed to ask about influences on *how* we teach research to radiographers, replacing the looser question asking about influences in general, to focus on teaching research. Making these changes turned the questions from general questions about influences on our teaching to more direct questions about *why* and *how* we teach research in particular to radiographers. The third drawing question was unchanged. These are the drawing questions that I used in the research.

DRAWING 1 Question What are the influences on WHY we teach research to radiographers?

- Prompt- policies, curriculum, SCoR, HCPC

DRAWING 2 Question What are the influences on HOW we teach research to radiographers at this university?

- Prompt- policies, curriculum, SCoR, HCPC

DRAWING 3 Question STAFF (How) do you think we embed research in the whole curriculum?

- Prompt- What factors make it difficult to teach/embed research in the whole curriculum
- Prompt- How do you think students perceive that embedding of research?

DRAWING 3 Question STUDENTS (How) do you think we embed research in the whole curriculum?

In Section 1.2 (starting on page1) I gave my definition of research as a spectrum of activity from creating new knowledge to reading, understanding and using that knowledge in practice, and have proposed the expression ‘symbolic research capital’ to explain the importance of a spectrum of research activity for a profession. Although the Drawing Questions ask about research, I purposely did not give any definition of what I understand as research to my participants as I wanted to elicit their thoughts without influencing their responses. In particular, I wanted to gain an insight into their understanding of what research meant to them, and whether they differentiated between creating knowledge, and identifying, accessing and using knowledge in the form of research, and how that was linked to the profession and teaching.

3.3.2.4 Data analysis in this study

My data analysis consisted of three phases, as shown in Table 3:1 and reiterated here:

1. Stage one: Co-Constructed Depiction- description of appearances in words and images,
2. Stage two: analysis
3. Stage three: interpretation and recommendations.

The entanglement of the method and data collected suggests that the data of both the drawings and the interview transcriptions needed to be depicted and analysed. At the end of each interview, the data collected comprised approximately one hour of recorded spoken data, and three drawings made by the participant during the interview. Depiction of each individual participant’s data included both direct quotes and the participant’s original drawings, subject to the necessary consent for their use. If participants had not been willing to allow their original drawings to be included, I would have sought permission to re-draw their originals using electronic words and shapes, so their handwriting was not on display.

To allow further analysis of themes within the data, each drawing was copied electronically and imported into MS PowerPoint. Here I added a layer of shapes by electronically drawing

over participants' shapes. Just as bone and tissues have different, recognisable, appearances on a radiograph, I outlined similar types of response in the same colour, as if each type of area of interest was an organ in a participant's shared body of knowledge. Bodily organs are all of similar importance and their appearance as a shade of grey on a radiograph shows evidence of their presence without any form of ranking. Therefore, the colours I used for the outlines similarly offer no ranking but draw attention to different response types.

As previously explained, I did not intend to carry out coding of the data, as I did not want to break up the data into small pieces, desiring instead to curate the data and create Co-Constructed Depictions of participants' words and images. Instead I looked through the data, seeing the whole as what Barthes terms the *studium*, waiting for those words and images which act as *punctum*, those which metaphorically stabbed me, as being of interest to me in my analysis. I acknowledge again that my entanglement within the data collection and analysis may have caused some sensitivity and specificity errors, but I am presenting my understanding of what is happening.

The interviews were transcribed and, in conjunction with the participants' images, read through for *puncta,* by which I mean the details that attracted me (Barthes, 1982) and themes. This included latent themes, that is ideas that fitted some of my preconceived themes such as habitus and professional field from my reading of Bourdieu, and others which seemed evident to me from the data. A short extract from my interview with Participant 1, a student, is shown in Table 3:3 overleaf.

Table 3:3 Extract from interview transcription showing development of themes from 'puncta', Participant 1 Student

0.	*Interviewer* OR Participant	*Puncta*	Starting to develop themes
1	*ok. so, the first one is I have already drawn the skeleton for you.* ***So, what are the influences on why we teach research to radiography students, why do we bother to teach you research do you think***		
1.	I think I'd like to think a lot of it is to... keep our interest in the subject and (drawing)	Keep an interest in research	habitus
2.	*lovely*		
3.	also, its to develop the profession as it were	Develop profession	Professional field
4.	*ok. can you explain that one a little bit developing?*		
5.	so, exploring new ways of working, new ideas, that's what I'm kind of referring to. new techniques even things like that	Develop profession	Professional field
6.	*anything else*		
7.	develop us so personal development as well so CPD	Personal development	habitus
8.	*yes*		
9.	to keep the profession progressing as well, so	Develop profession	Professional field
10.	*any outside influences on why we teach you do you think*		
11.	I know this course was previously NHS funded so there may have been some input from the NHS about what to include and research may have been one of the things that they had on their mind perhaps	Ext influence	NHS

Here is the original drawing for Question 1 for this participant.

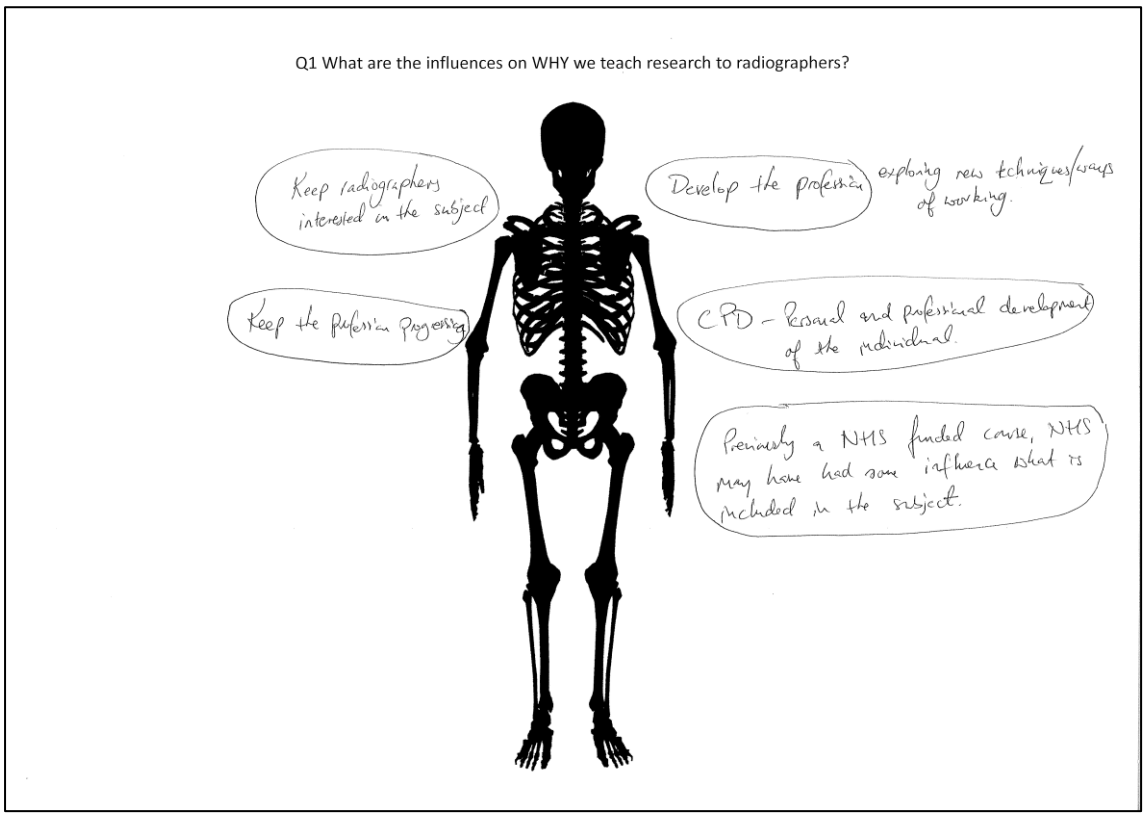

Figure 3:4 Drawing for Question 1, Participant 1 Student

I wrote a vignette for each participant, as a narrative of their spoken words, based on some of the *puncta* in each participant's transcript. An example for this participant can be seen in Appendix E: 'Example of vignette written after data collection'. At this point, I had two separate types of items for analysis: the three images for each participant and the transcription and vignette of their interview. To bring all these elements together I made the Co-Constructed Depictions by adding participants' spoken words directly on to their drawings. I added their words in boxes, coloured to correspond to the colour overlays I used on the drawings. The Co-Constructed Depictions are therefore a depiction, in words and images of each participant's thoughts and drawings, which I as the entangled researcher have curated- depictions constructed by both participant and researcher which form the images from which I made further analysis. The Co-Constructed Depiction for Participant 1

Student is shown in Figure 3:5 below. Further examples of these images can be seen in Appendix F: Co-Constructed Depictions.

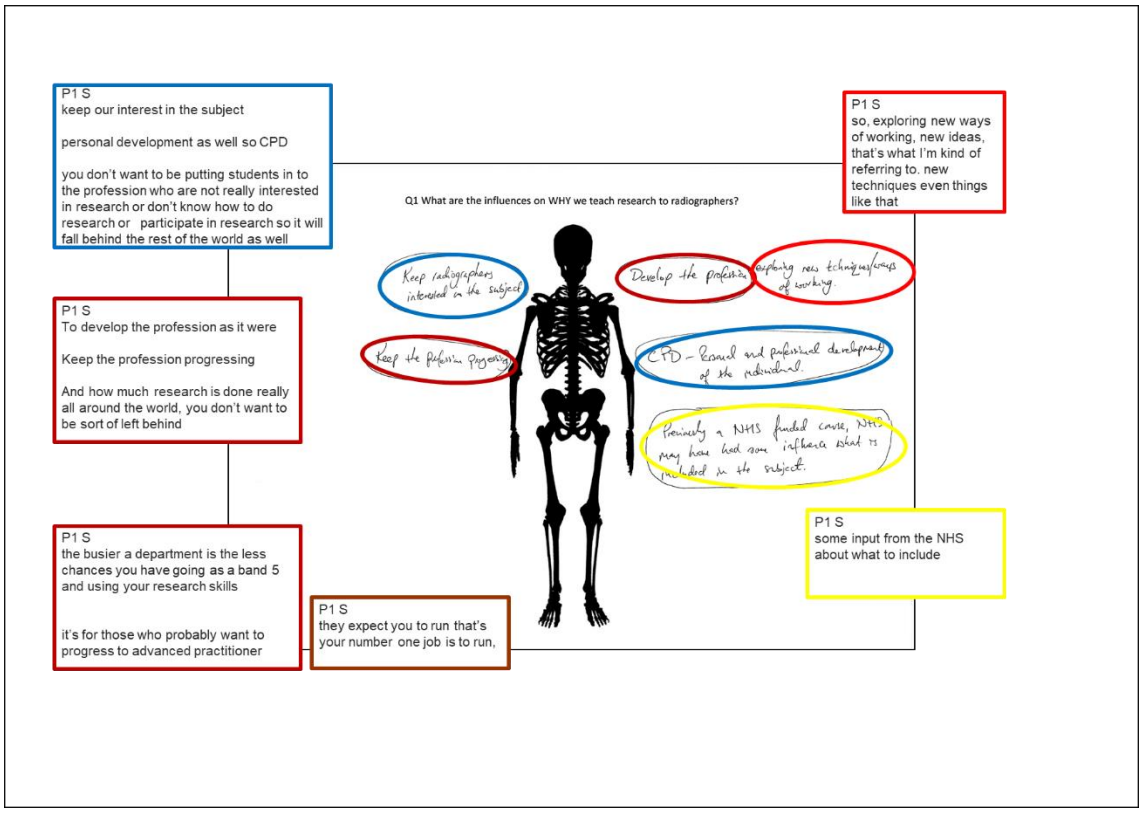

Figure 3:5 Co-Constructed Depiction, Question 1, Participant 1 Student

Once the themes were established and Co-Constructed Depictions coloured accordingly, for each group of participants, that is students, postgraduate students and staff, I overlaid the coloured outlines of each theme, for each group. This afforded me the opportunity to analyse similarities and differences between the different groups. The final stage was to make conclusions and recommendations, as the interpretive stage of the analysis. A more detailed explanation of the process of creating the Co-Constructed Depictions is given in the next Chapter.

3.4 Ethical considerations

Ethical approval was gained from the Faculty Academic Ethics Committee for the Faculty of Health, Education and Life Sciences at the researcher's university in accordance with the university's statement on research ethics (Academic Ethics Committee, 2016) (Appendix G: 'Ethics Committee Approval Letter'). The Head of the Department of Radiography and the Head of the School of Health Sciences granted me written permission to invite to interview members of staff and students for this study (Appendix H: 'Permission of access to participants'). It was not considered necessary to apply to NHS England Health Research Authority for ethics approval since the postgraduate student participants were health professionals who were asked to participate due to their joint professional role and student status. Results from completed NHS REC (Research Ethics Committee) Approval (NHS Health Research Authority, 2016b) (Appendix I: 'NHS REC Approval Result') and MRC (Medical Research Council) NHS Health Research Authority (NHS Health Research Authority, 2016a) (Appendix J: 'MRC (Medical Research Council) NHS Health Research Authority') on-line resources support this decision.

Informed consent was sought from participants by asking them to sign to confirm their consent to being interviewed and for their comments and drawings to be used and analysed for the study and dissemination of results after providing them with information about the researcher, purposes of the study and the methods to be used for data collection (Gillham, 2005). As the participants were English speaking lecturers and students in an English university there were no problems with understanding consent documents provided in English. None of the participants were from what are considered vulnerable groups (Academic Ethics Committee, 2016), and all were able to give informed consent to participate. The questions asked and issues explored were not expected to cause distress to participants but if they had done, then the interview would have been terminated if that was what the participant wished.

As a radiographer, it is vitally important to ensure the correct identity of the patient and their images to ensure that the correct imaging technique is performed and that the images created are correctly identified as belonging to a patient, so the report of the images is linked clearly to both. Similarly, students are clearly identified before assessments and their marks matched to their work. Thinking about anonymising data and ensuring anonymity in a research project thus runs counter to my previous professional work, but as it is a normal procedure in research, where the results are shared with a wider audience, I was happy to comply fully with the requirements of this type of activity, that is, maintaining anonymity and confidentiality, while ensuring a true match between participants' words and images for analysis and dissemination. I thus maintained a locked file with participants' information and gave participants an identifier based on their participant group, that is 'P' for participant followed by a number corresponding to the order in which participants contacted me to be included, then either 'S' for student, 'PG' for postgraduate student, or 'Staff'. I used these identifiers in the Co-Constructed Depictions, for example 'P1 S' is used for Participant 1, a Student, while 'P16 PG' represents Participant 16, a Postgraduate student, and 'P4 Staff' represents Participant 4, a Staff member. For the data description and analysis in Chapter 4 (starting on page 99), I used the same numbering, but wrote the type of participant in full, for example 'P1 Student'.

In our small department, it was necessary to ask participants to help maintain their own anonymity. For example, any participants approached by others were asked not to reveal their involvement to their colleagues or fellow students, unless they were happy to waive their anonymity as a participant.

Primary data consisted of audio recordings, participant drawings and my handwritten notes from the interview. The recordings, electronic images of the drawings, notes and transcriptions were kept in password protected files and if moved were on an encrypted data transfer device. Primary data will be destroyed after 5 years in accordance with the interviewer's faculty data protection policies (Boultwood and McGee, 2013; UK Parliament,

1998). Nothing that may identify a participant will be used in this or any future written analysis to maintain anonymity and confidentiality.

I conducted the interviews during working hours, away from the main radiography office area under the guise of meetings or tutorials. I informed co-workers of my whereabouts and carried a mobile phone at all times to protect against potential problems of lone working. Care was taken not to enter into discussions outside the interview setting unless the participant was happy for this to happen and thus potentially identify themselves to others as a participant. Participants were informed at the start of the interview that at any time during the interview, they were free to stop and subsequently have the contents of the interview withdrawn from the study up to three months from the date of the interview if desired. If following an interview, a participant wished to redact any part of the interview this information would not have been used in the transcription or dissemination.

There may have be some resistance by participants to participate fully in interviews due to perceived power or status differences between themselves and me as the interviewer. For example, some colleagues may have been reluctant to discuss issues with me as they might feel that I was checking or evaluating them rather than eliciting their thoughts, while undergraduate students may see me as a lecturer rather than a researcher. In the case of postgraduate students, the resistance may be a product of a conflicted student/clinical expert position in relation to me. King and Horrocks (2010) suggest that these perceptions may lead to participants being unwilling to discuss certain topics and can adversely affect rapport between the participant and the researcher. King and Horrocks (2010) go on to suggest the researcher should emphasise their role as a researcher in the interview rather than, in this case, as a colleague or lecturer. I did this by reminding participants of the confidential nature of the interview and emphasised my role as a research student in the setting.

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Chapter 4 Data description and analysis

This chapter shows how I applied the new method I have developed, Co-Constructed Depiction, to depict and analyse the data, and I present my findings. As mentioned earlier in the Methodology Chapter in Table 3:1 (page 76), data analysis consisted of three phases, reiterated here:

1. Stage one: Co-Constructed Depiction- depiction of my interpretation of appearances of participants' responses, in words and images
2. Stage two: analysis
3. Stage three: interpretation and recommendations.

I next describe how I arrived at stage one, Co-Constructed Depictions, and then how I used the images to explore and develop conceptual themes, such as habitus and field, and how I answered my research questions more directly.

4.1 Co-Constructed Depictions

When a patient undergoes a medical imaging examination, an image is produced, and the first part of the report that is written about the image describes what has been seen. This section introduces a selection of participants and their images, in a descriptive manner. The next part of a report discusses what these appearances may mean and so here the following section will discuss the interpretation of all participants' data using a theoretical approach to thematic analysis (Braun and Clarke, 2013) to show where I have recognised patterns, based on my previous knowledge and the theoretical concepts used throughout the thesis. I will also offer my explanations for similarities and differences between the different groups of participants.

4.2 The process of Co-Constructed Depiction

The data collected from the 18 participants consisted of recordings of interviews and participants' drawings. The drawings were scanned, imported into Microsoft PPT and I drew shapes over them. An example of this stage is shown in Figure 4:1 overleaf.

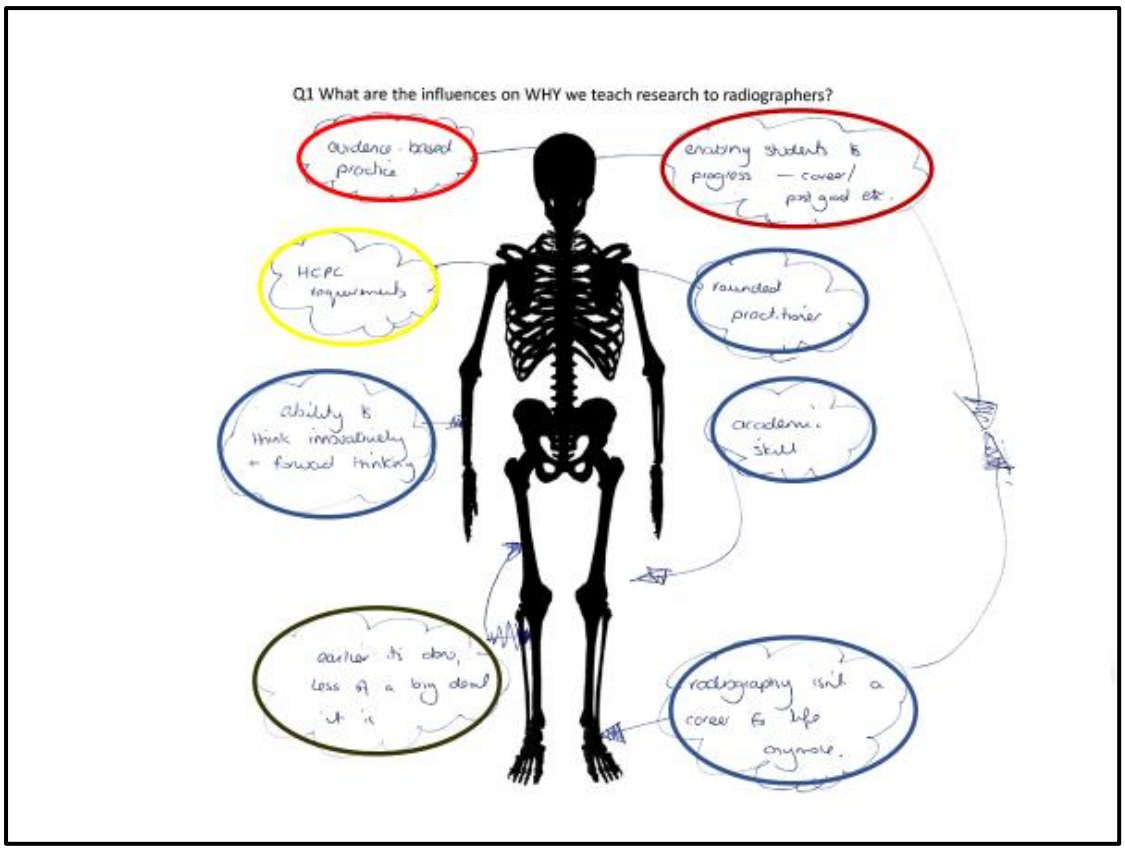


Figure 4:1 Coloured outlines added by me over a participant's original drawing

Meanwhile, I realised that transcription would be a long task, as I had 18 interviews ranging from 18 to 49 minutes each. I found transcription by typing was a slow process during which I noticed myself becoming distant to what I was hearing and writing, perhaps because the act of typing took much of my concentration. In addition, I was cutting up the data onto small chunks to transcribe, with much replaying of portions of the recording to catch up with the typing and so I lost the meaning of the whole. To alleviate the stress, and to immerse myself better in the data, I tried audio transcription in MS Word. This had the advantage that I could control the audio player easily and skip through some of the silences that occurred as my participants were drawing, but more importantly, I listened very closely and as I re-spoke their words, I re-lived the interview, almost in real time. Interestingly, I noticed that sometimes my phrasing of a sentence was different to theirs which highlighted the way that my whole research is influenced by my position within it, since if uncorrected or unnoticed,

these personal rather than individuals' perceptions of phenomena could influence my findings. Consequently, when checking the recordings and the transcription, I was careful to correct this type of error. An advantage of this method of transcription is that as I have looked at the images and transcriptions during the analysis, I have clearly heard the participants' voices in my mind, which has helped me contextualise comments and themes as I have explored them.

After checking the accuracy of the transcriptions, I read through them in conjunction with the images, to look for features which accorded with the conceptual themes (Braun and Clarke, 2013) I had already read and written about, such as habitus and professional field and others which stood out to me, the *puncta*. I used these to write vignettes for each participant, distilling their thoughts into a shorter piece, heavily interspersed with direct quotes, an example of which appears in Appendix E: Example of Vignette written after data collection. Now I had the participants' themed drawings, and quotes from their interviews that supplemented these. These quotes helped me create my first table of themes shown below in Table 4:1.

The next step was to put all this together, using the participants' own drawings with extracts of their spoken words, as chosen by me, to illustrate the themes I was working with. I added each extract to the corresponding PowerPoint slide and gave them a coloured box matching the colours used for the drawing overlays. At this stage I made further refinements to the themes I wanted to use, resulting in the colours used as below in Table 4:2 and reflected in the structure of the analysis and discussion in this chapter.

Figure 4:2, overleaf, shows the process described above in diagrammatic form. The horizontal arrows represent the flow between the researcher and the participants' data and the entanglement between them, while the last box represents the co-constructed depictions, showing their development from the two data sources

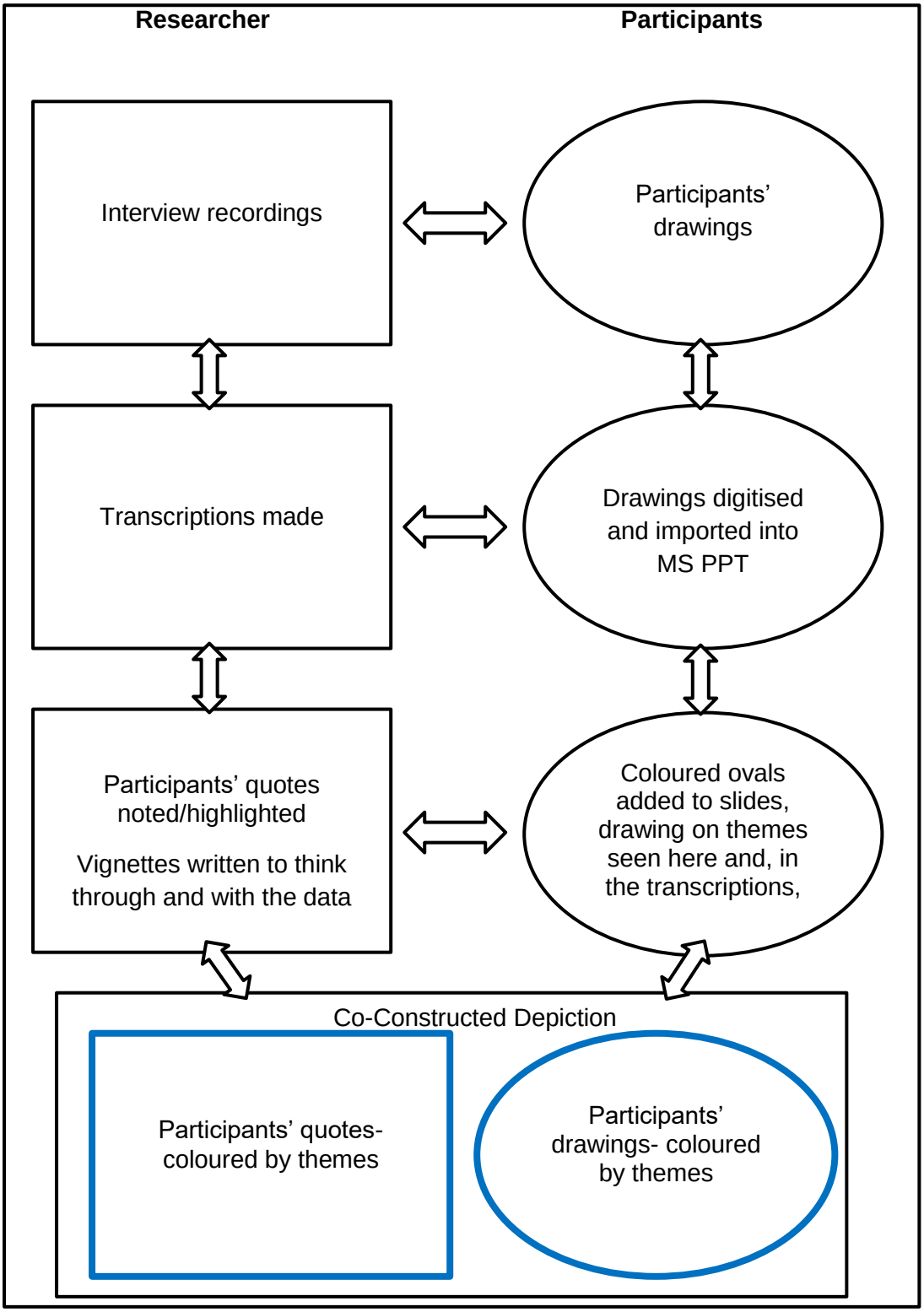
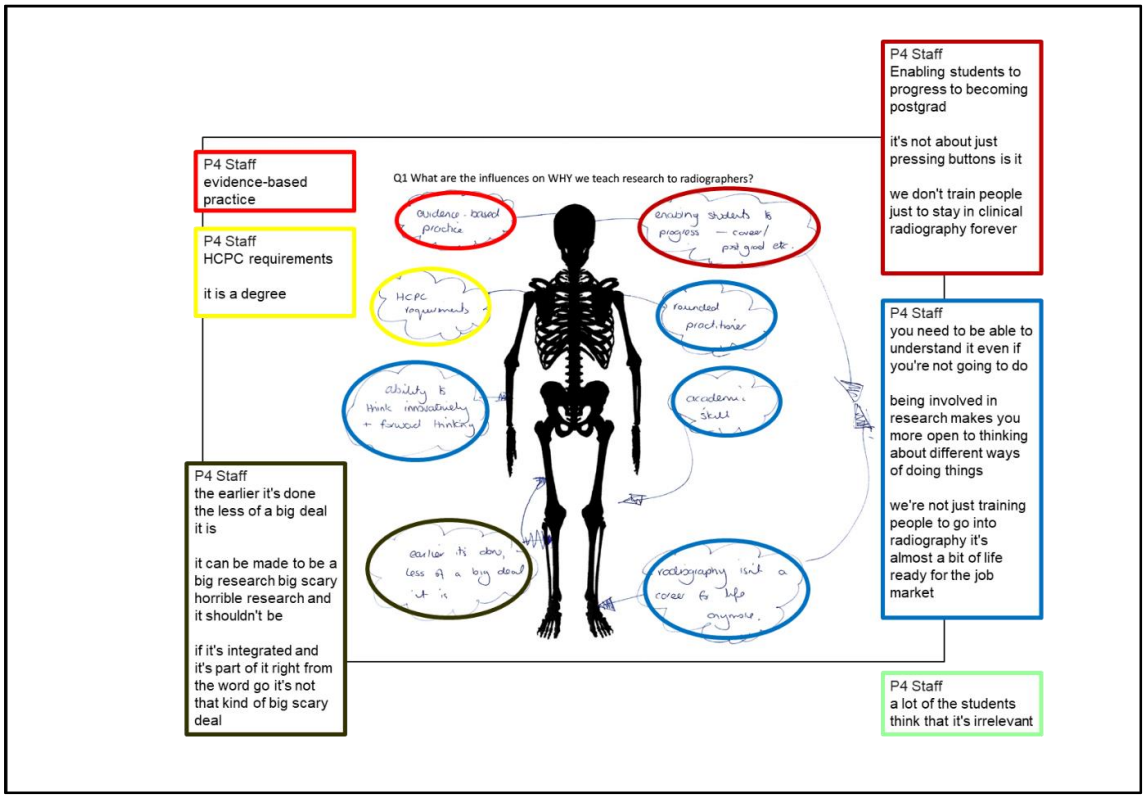


Figure 4:2 Process for making Co-Constructed Depictions

The resulting images are the Co-Constructed Depictions that constitute the new method of displaying data that I have developed, an example of which appears below in Figure 4:3 showing the Co-Constructed Depictions for one participant, P4 Staff, answering drawing one question during the interview.



Colour Key for Co-Constructed Depiction							
Habitus- all		Hit the ground running		Influences		Normalise research	
Habitus of lecturers		Professional field- Profession oriented		Constraints		Student participation in research	
Student constraints- habitus		Professional field- patient oriented		Suggestions for improvements		Embedding research- curriculum	

Figure 4:3 Co-Constructed Depiction- Drawing 1 Question with colour key

4.3 Developing the Co-Constructed Depictions for analysis

While reading transcripts and adding coloured shapes to participants' drawings, I used many different headings on my colour key, for different sub-themes. Once all the data had been analysed, I realised that there were several main themes, under which all the sub-themes could be organised. I used Bourdieu's (Bourdieu and Wacquant, 1992) concepts of habitus, field, and the notion of replacement of the concept of *profession* with that of *field* to gather some themes. Others derived principally from the questions I was asking about influences on why and how we teach research, while Drawing 3 question asked directly about embedding research in the curriculum and so formed the final main theme.

Table 4:1 opposite shows the development of my themes and the colours used. A reminder here that the colours are not a form of ranking, merely visual aids to seeing different themes on images. The first column indicates the colour I was using at first on the PowerPoint overlays of participants' drawings. The three columns Q1, Q2 and Q3 relate to the drawing questions and corresponding participant drawings that were eliciting these ideas. Once I had these, I overviewed them all to see if there were any commonalities between them. During this stage, I developed six main themes, and these are indicated, but not ranked, by the numbers in the columns 'Theme group' below:

1. Habitus
2. Professional field
3. Influences
4. Constraints
5. Improvements
6. Embedding research in the curriculum (from staff and students' perspectives)

Table 4:1 First table of themes

Colour used	Drawing 1 Question WHY	Theme group	Drawing 2 Question HOW	Theme group	Drawing 3 Question EMBEDDING	Theme group
	Habitus	1				
	Professional field	2				
	Patient oriented	2				
	NHS external influences	3				
	SCoR/HCPC external influences	3	SCoR/HCPC external influences	3		
			Other HEIs influences	3		
			Lecturers' experience	1		
			Student input	3		
					Literature searching	6
					Embedded in all 3 years	6
					Student participation	5
			Improvements in curriculum	5		
					Suggestions for improvements	5
			Constraints	4		
			Who is best to teach?	1&5		
					Student constraints	1&4
					Link Levels 5&6	5
					Resources	4
					Hit the ground running	1&4& 6
					Normalise	1&5

The next stage was to collect and colour those parts of participants' transcriptions that linked to the drawings and I added them to the PowerPoint slides to make the Co-Constructed Depiction images. From this analytical work, I confirmed that I had six main themes and rearranged the sub-themes within them as in Table 4:2 below. This table represents the final colour choices, themes and sub-themes as discussed in this chapter.

Table 4:2 Themes developed for use in the thesis

Colour used	Main Theme	Theme numbers	Sub-Themes	Colours
	Habitus	1	Habitus- all	
		1	Lecturers' habitus – related to teaching	
		1	Student constraints- habitus	
		1	Hit the ground running	
	Professional field	2	Profession oriented	
		2	Patient oriented	
	Influences	3	Influences	
	Constraints	4	Constraints	
	Improvements	5	Suggestions for improvements	
		5	Normalise research	
		5	Student participation in research	
	Embedding research in the curriculum	6	Student and staff perspectives	

4.4 Worked examples of Co-Constructed Depiction

I wrote short vignettes based on the interview data to think through the themes talked about by participants. Extracts from the vignette and transcriptions were used verbatim to add to the boxes on the PowerPoint slides to make the Co-Constructed Depictions. An example of a vignette is available in Appendix E: Example of a vignette written after data collection. This section continues with three examples of Co-Constructed Depictions using data from three participants, one student, one staff member and one postgraduate student. For each participant I have included here the three Co-Constructed Depictions which I made using their words and drawings, one for each Drawing Question together with a colour key and short description.

Images of all Co-Constructed Depictions are available in Appendix F: Co-Constructed Depictions.

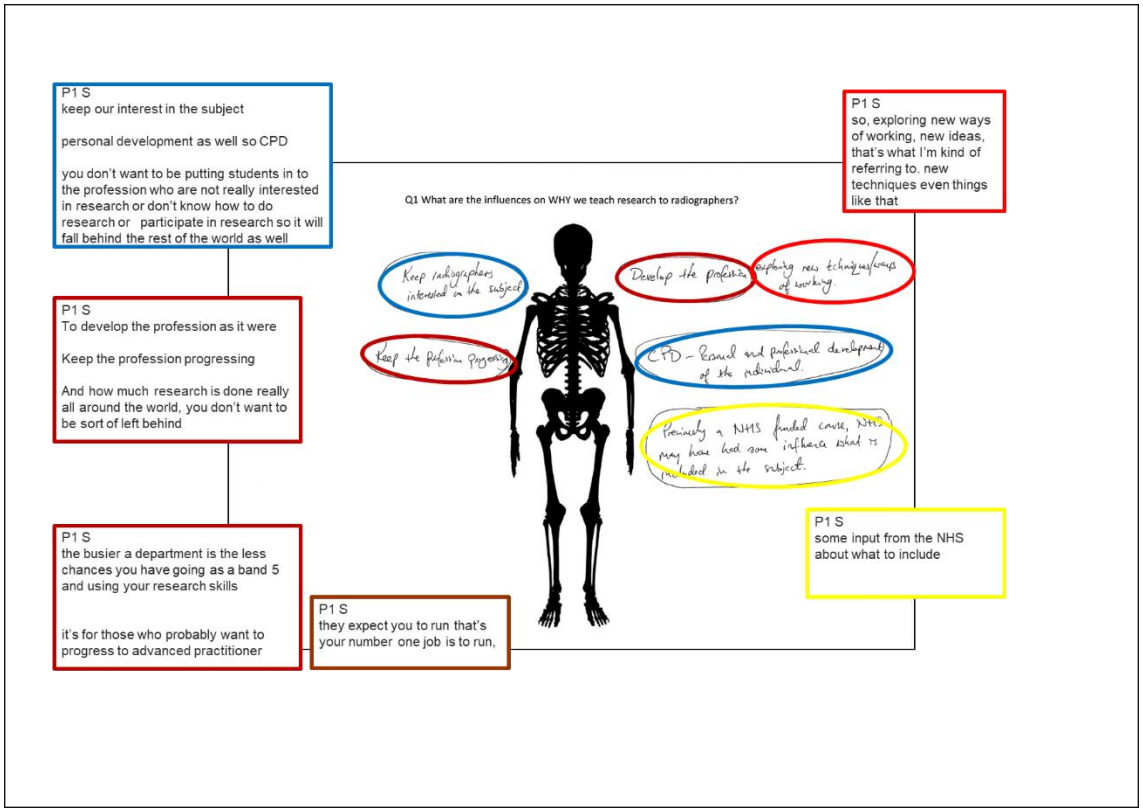


Figure 4:4 Participant 1 Student, Co-Constructed Depiction, Drawing 1 Question

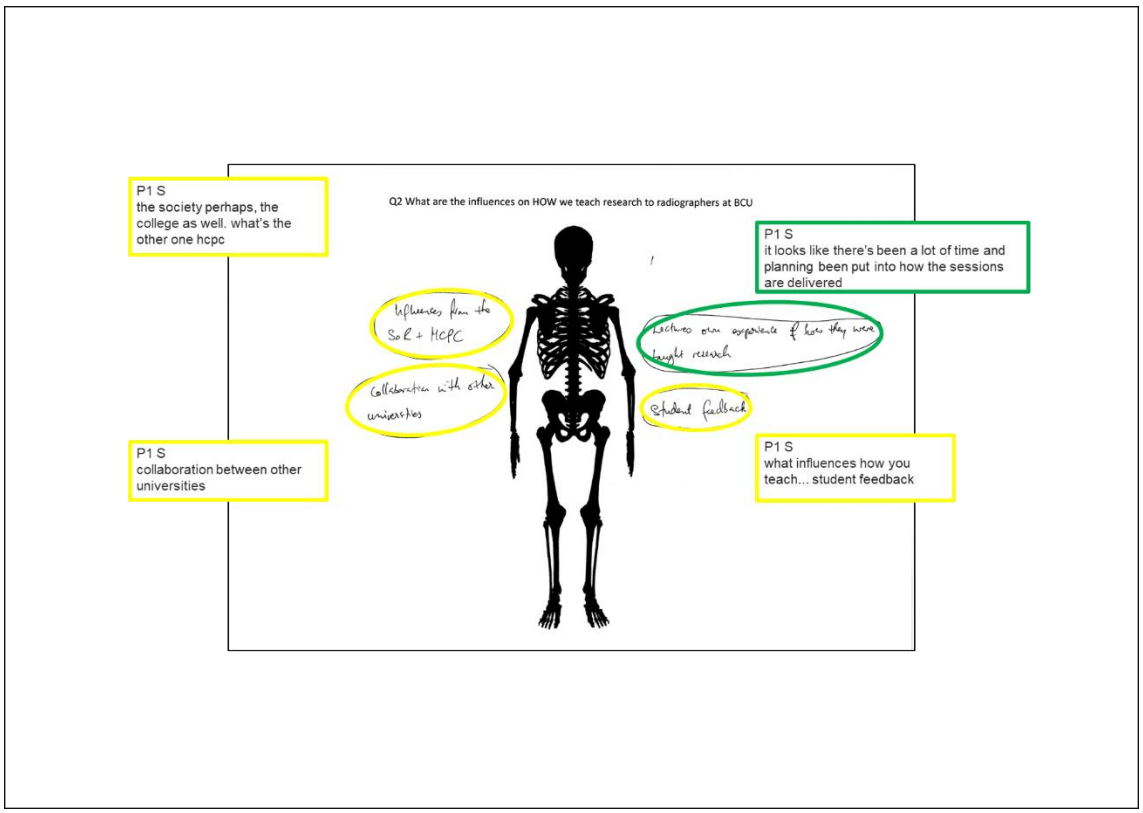
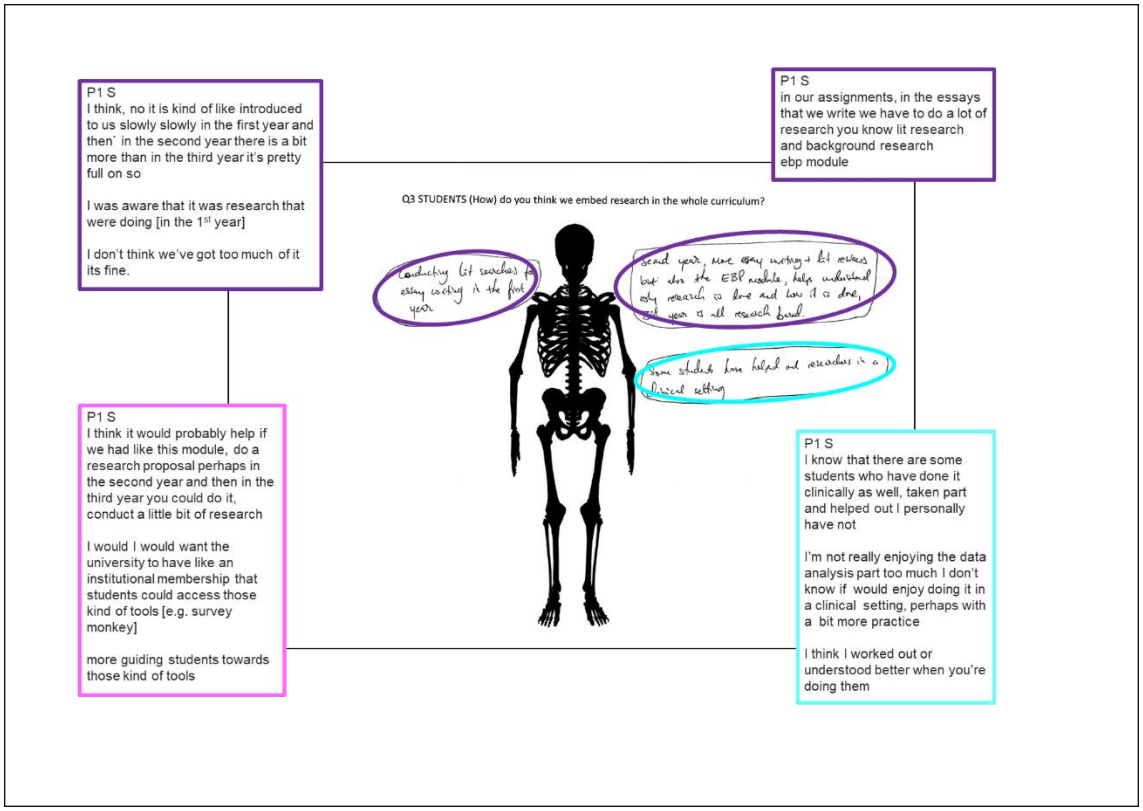


Figure 4:5 Participant 1 Student, Co-Constructed Depiction, Drawing 2 Question



Colour Key for Co-Constructed Depiction							
Habitus- all		Hit the ground running		Influences		Normalise research	
Habitus of lecturers		Professional field- Profession oriented		Constraints		Student participation in research	
Student constraints- habitus		Professional field- patient oriented		Suggestions for improvements		Embedding research- curriculum	

Figure 4:6 Participant 1 Student, Co-Constructed Depiction, Drawing 3 Question with Colour Key

This student gave responses that fitted into a wide range of sub-themes. Although they did not draw many ideas, because I added their comments onto the images there was a lot of detail to think through. In this case, Co-Constructed Depiction has added to the drawing in a way that all the participants' ideas can be seen together, thematically. What stands out is that they were aware of a wide range of influences on how and why we teach research to radiographers, as shown by the yellow shapes.

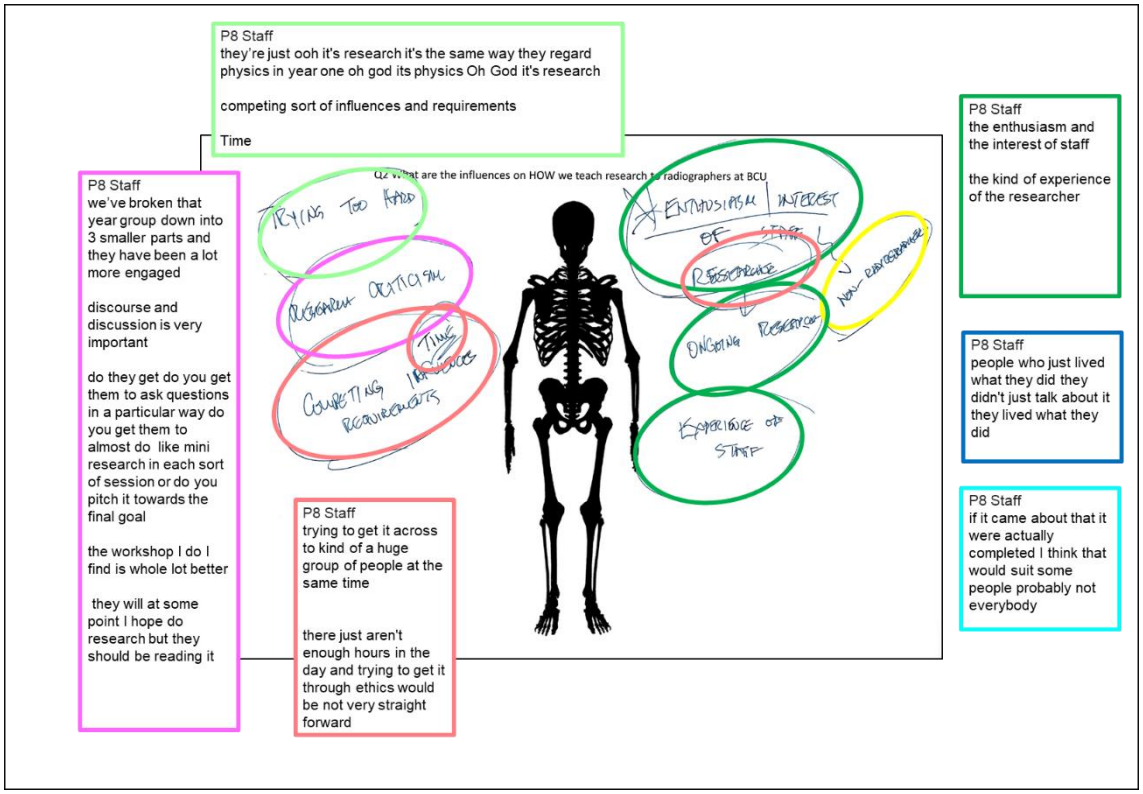


Figure 4:7 Participant 8 Staff, Co-Constructed Depiction, Drawing 1 Question

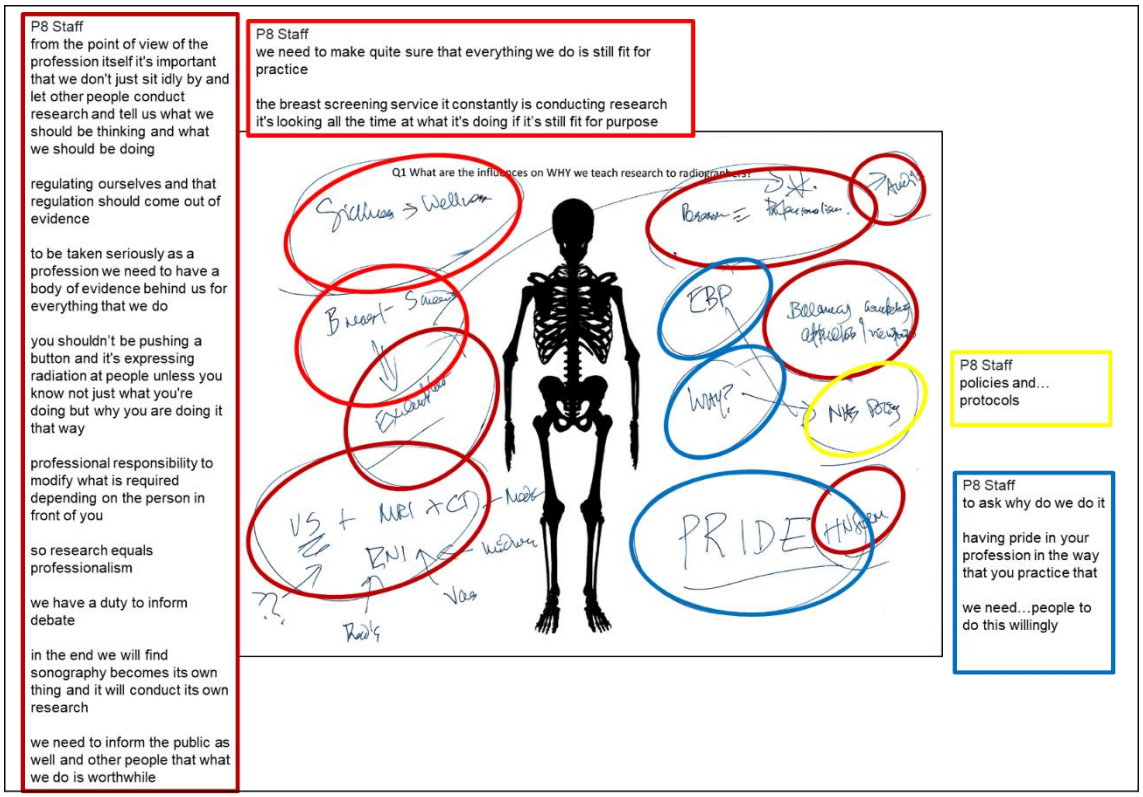
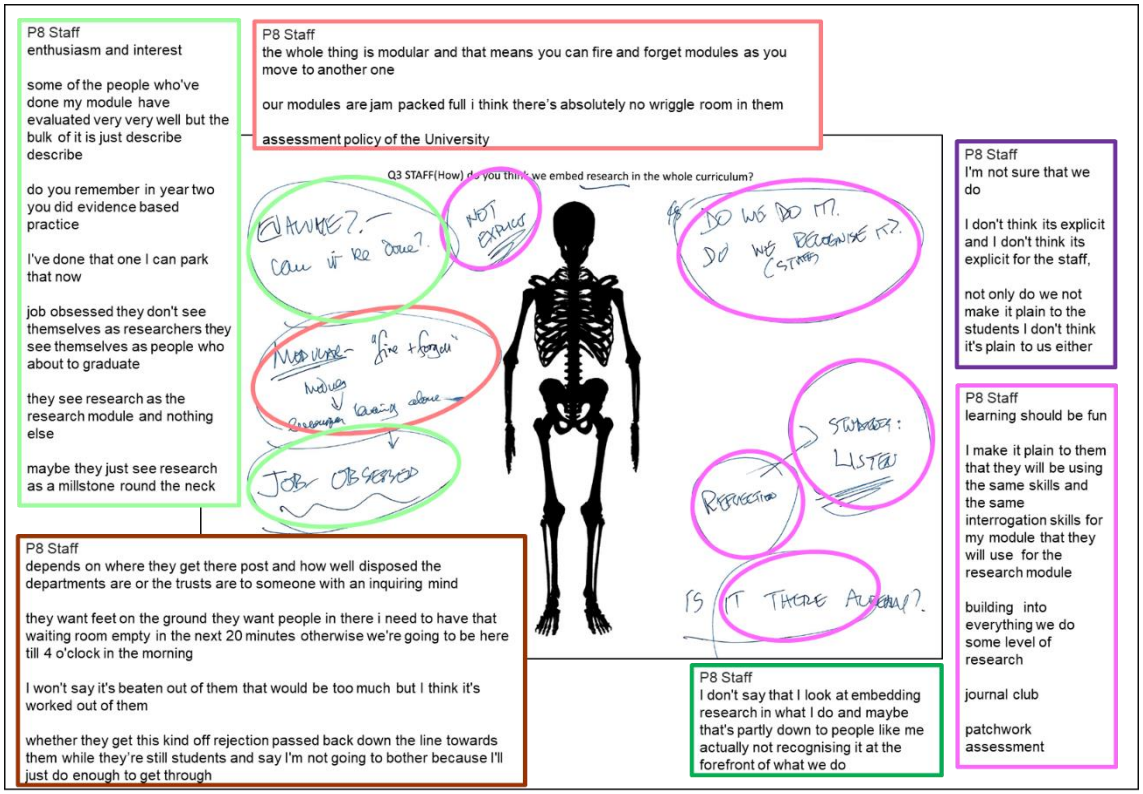


Figure 4:8 Participant 8 Staff, Co-Constructed Depiction, Drawing 2 Question



Colour Key for Co-Constructed Depiction							
Habitus- all		Hit the ground running		Influences		Normalise research	
Habitus of lecturers		Professional field- Profession oriented		Constraints		Student participation in research	
Student constraints- habitus		Professional field- patient oriented		Suggestions for improvements		Embedding research- curriculum	

Figure 4:9 Participant 8 Staff, Co-Constructed Depiction, Drawing 3 Question with Colour Key

This staff member used the drawings as a combination of a mind-map that guided their spoken responses, and as a way of noting what was most important to them. Interestingly they underlined the word *research* in the third image, perhaps as a focus through this part of the interview. This participant was very generous with their time and thoughts, so the images are quite full. For me this is a bonus as there is lots of data for analysis, but when using this method again, it might be necessary to start with doing the Co-Constructed Depictions images for the longest and shortest interviews first, to ensure the comments and images are a good fit, that is not too sparse, and not too overcrowded on the page size I choose to use.

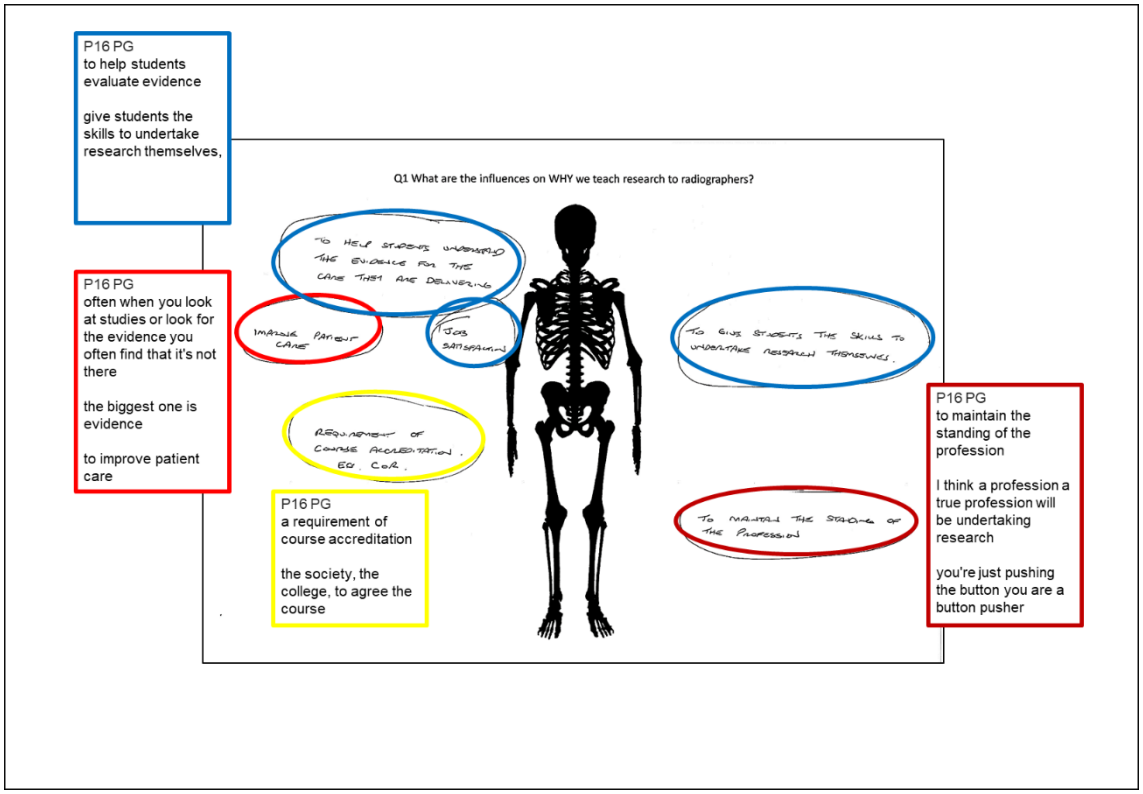


Figure 4:10 Participant 16 Postgraduate Student, Co-Constructed Depiction, Drawing 1 Question

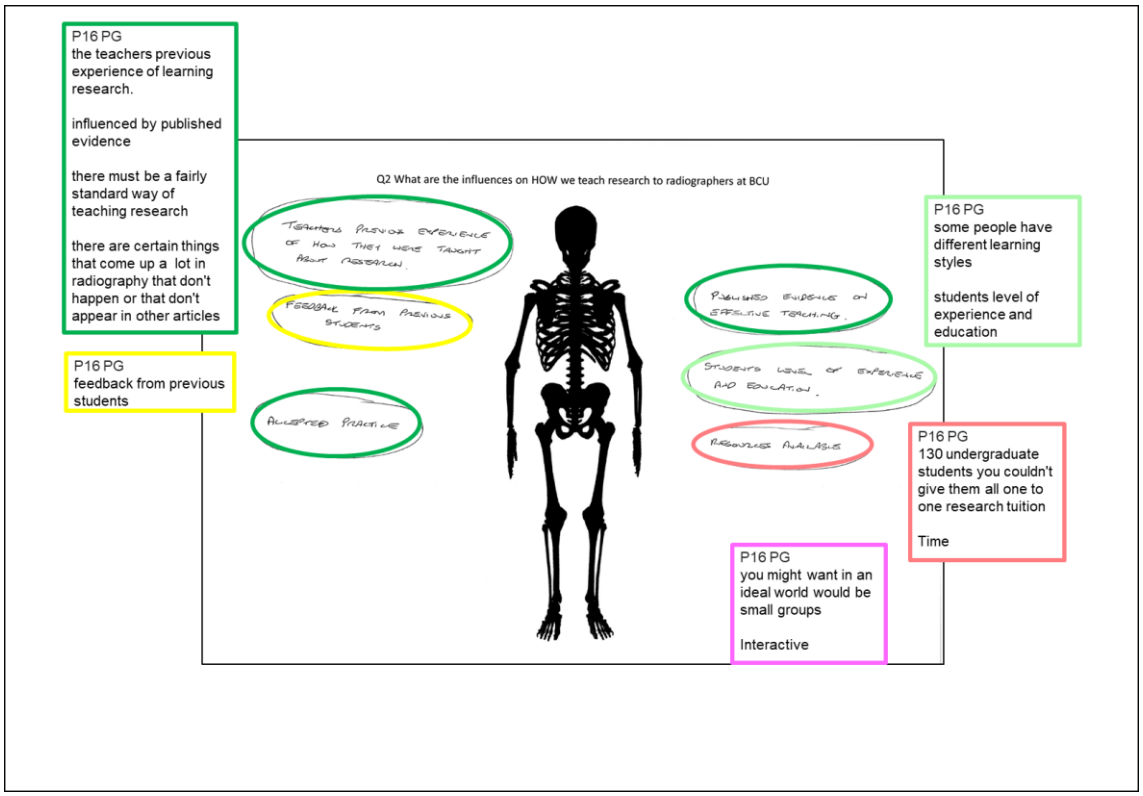
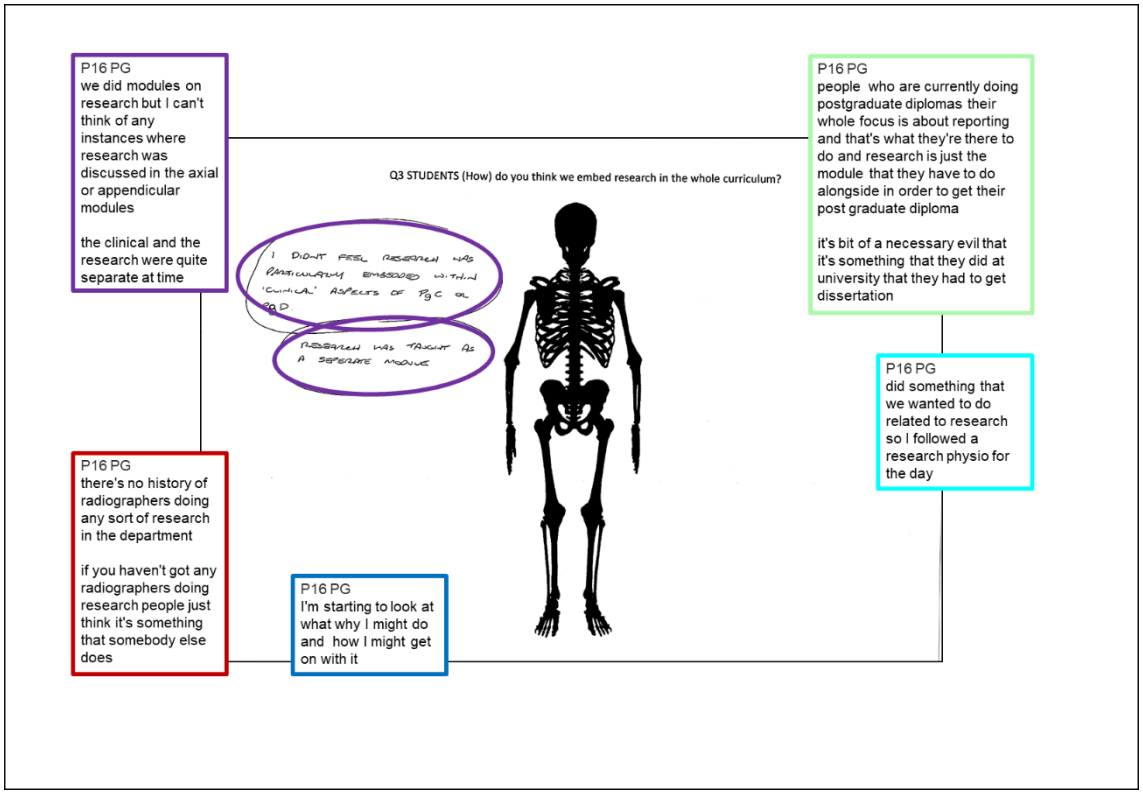


Figure 4:11 Participant 16 Postgraduate Student, Co-Constructed Depiction, Drawing 2 Question



Colour Key for Co-Constructed Depiction							
Habitus- all		Hit the ground running		Influences		Normalise research	
Habitus of lecturers		Professional field- Profession oriented		Constraints		Student participation in research	
Student constraints- habitus		Professional field- patient oriented		Suggestions for improvements		Embedding research- curriculum	

Figure 4:12 Participant 16 Postgraduate Student, Co-Constructed Depiction, Drawing 3 Question with Colour Key

This postgraduate student also gave many answers fitting into different themes. The third drawing has only two participant comments although they made several comments orally. I could perhaps have encouraged them to draw more but was mindful that interrupting them while talking might affect their thoughts. They chose to use the drawing to write fairly long answers compared to some participants, with shorter spoken responses, but there is still a wide range of spoken and drawn data to use.

4.5 Explanatory note about the images that follow

The first part of CCD was to make the images as described above. The next stage was an analysis of all participants' data by looking at the themes. In this section, I have included stacked images, which means each image is an overlay of a particular theme or sub-theme for all participants in each of the three groups: students, postgraduate students and staff. These include the coloured overlays I made on participants' drawings and the coloured boxes around the text based on their quotes illustrating the themes that I added to each CCD. Because of the nature of the collection of data and the development of each CCD, the ovals towards the middle of each image represent participants' drawings, while the boxes represent the textual element of each CCD as shown in Figure 4:13 below. Each theme is discussed with reference to these stacked images, which are based on the CCD images I made for each participant.

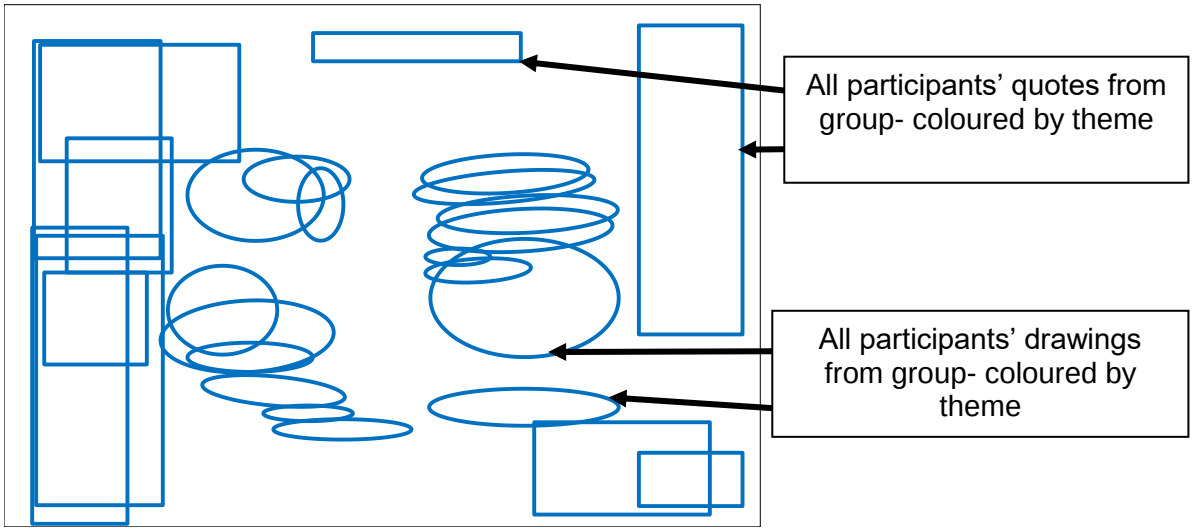


Figure 4:13 Example, showing stacked images

I chose to make separate images for each group of participants to illustrate the frequency with which different groups spoke and drew about different sub-themes, although I acknowledge there were different numbers of participants in the groups. In this way I was able to look for similarities and differences between the responses between the three

groups, since the images are easier to interpret at a glance than text but importantly are derived directly from the Co-Constructed Depictions.

There now follow discussions and analyses of each theme and sub-theme that I developed, each accompanied by and illustrated with stacked images as described before.

4.5.1 Habitus

Stacked images of participants' drawings and comments from CCDs within the theme *Habitus of Individuals*

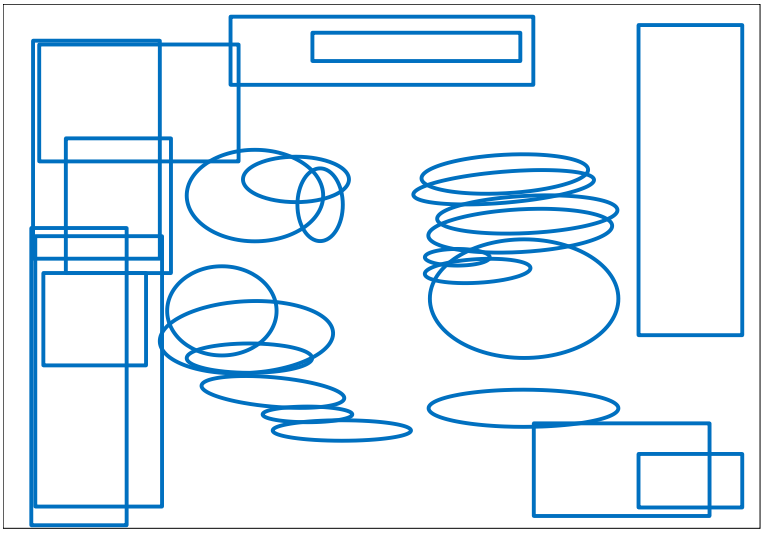


Figure 4:14 Students- Habitus

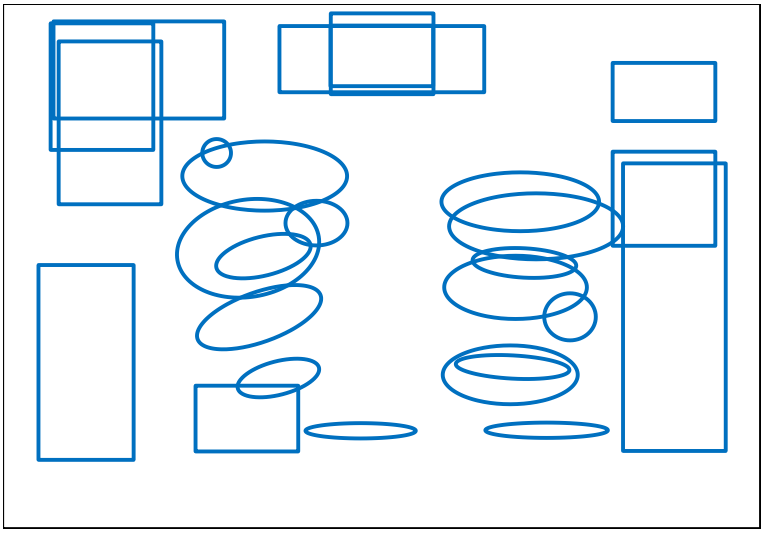


Figure 4:15 PG Students- Habitus

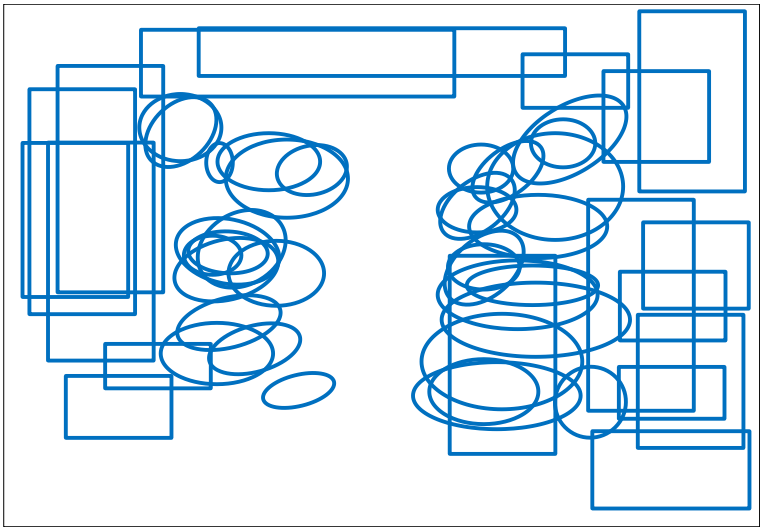


Figure 4:16 Staff- Habitus

This theme developed from Bourdieu's (1977) description of habitus in terms of the embodiment of radiographer within each participants' habitus. The first sub-theme is about radiographer habitus and 'symbolic research capital' from the perspective of all participants. This theme developed from thinking about the students' habitus and how it affects their perceptions of who they are, and who they will become, as qualified radiographers. However, I realised that it is not only the students' habitus which affects learning, but that of the lecturers too, so the sub-theme 'Habitus of lecturers' developed from the original theme 'Lecturers' experience' since experience is embodied in the habitus. The sub theme 'Student constraints- Habitus' was used to identify where both staff and students talked about how the habitus of students affects their learning and engagement with research in the curriculum and in the clinical practicum. 'Hit the ground running' fits here because it is about the enacted habitus newly qualified radiographers are expected to perform by some clinical colleagues when they join the workforce. In other words, they are expected to be able to be a fully functioning member of staff, with the ability to work alone and take on the workload equivalent to that of more experienced staff.

Many of the replies to the Drawing 1 Question, 'What are the influences on WHY we teach research to radiographers?' which are depicted in the images opposite, were around the concept of habitus in the form of what a radiographer needs to be able to do practically, and about the importance of research for a professional. Although none of the participants used the expression habitus, many of their replies fitted with my understanding of habitus and as can be seen in the images opposite, all three groups made numerous references that I felt refer to this concept. This suggests that they were aware of changes in students as they started to embody research within their habitus during the three-year course as they progressed from layperson to professional, talking about things they would be doing, or are now doing, which relate specifically to being a qualified radiographer.

Staff gave answers that showed their perception of the importance of research awareness and ability in students for example:

> …for them to have a greater understanding of exactly what they are doing rather than just [being] told to do something (P21 Staff)

Radiographers need to think as well as do, as they are expected to act as independent practitioners, which means having a habitus that embodies analytical ability and adaptability in practice. For example, Hafslund et al. (2008) pointed out that decision making relies on critical assessment of data, and as P21 Staff is suggesting above, radiographers should not do what they are told unquestioningly. However, another comment from a staff member suggested that there is a divide between radiographers who will do research, and those who do not expect it to be part of their habitus:

> …you need to be able to understand it even if you're not going to do it (P4 Staff)

It is not clear if they feel some radiographers will choose not to be research active, or if they will not have the opportunity to do research but some comments from students showed they agreed, for example:

> …perhaps if I make the effort I will look into other people's research and try and apply in regard to undertaking my own research I think that is a bit far-fetched really (P19 Student)

> I will keep up my knowledge obviously, but I don't think I'll use the research aspect of it all that much (P11 Student)

This attitude, that research is for other people, suggests that these students already feel the burden of lack of power, perhaps based on their perception of a personal lack of academic capital. This might be an example of how students and newly qualified staff, who know about the hierarchy within the profession which is emphasised by the four-tier structure and pillars of advanced practice, are unable to visualise themselves attaining higher levels of education and responsibility within the profession. Bourdieu writes about the competition between different professional fields, saying there is a:

> …network of competitive relations which give rise, for example, to conflicts of competence – conflicts over the qualifications for legitimate practice of occupation and the legitimate scope of the practice – between agents possessing different qualifications' (Bourdieu, 1984: 244)

I suggest that this concept can be utilised to help explain the issues of conflict *within* a profession as well as between professional fields, as there are different levels of qualifications needed for different levels, or scopes, of practice. As educators, we may be failing these students by not helping them visualise their potential and picture these levels as steps within, rather than barriers to, their progression.

In addition, these participants seem to have a perception of research as a single activity, where *doing* research is the only portion of the research spectrum they articulate. They did not appear to see any use for the other skills they might learn by engaging with research as a taught subject. However, other students were more aware of research skills being important in their future role saying:

> I think you're trying to create radiographers who can think for themselves (P2 Student)

This student talked about the teaching and learning being part of a process of 'creating' radiographers, which aligns with my suggestion that students develop a radiographer habitus during their education. Importantly they suggest that they have recognised that this habitus includes critical skills vital for practitioners who can 'think' as well as 'do'. In an echo of what students hear lecturers say throughout the course, one student said:

> …we are required to be autonomous health care professions [*sic*] and exercise our own professional judgement (P19 Student)

This comment suggests that students hear the message from staff that radiography is a profession, and to be a professional involves making informed judgements based on a body of knowledge. However, it is not clear if this student believes what they say here, as they also had an ambivalent attitude towards research, demonstrated in their comment above where they used the words 'effort', 'try' and 'far-fetched' in relation to using and doing research them self.

There is a dichotomy emerging here between the example above where I suggest that educators should help students visualise their potential, and what P19 Student says here

where it seems lecturers are talking about the future for students, but students may not believe us anyway. This may be due to a hysteresis effect in students' habitus (Bourdieu, 1984) when, following their university education which they may have found difficult, they cannot imagine themselves re-entering education at postgraduate level, although in fact almost a quarter of the clinical workforce are either training for or working in advanced practice (Society and College of Radiographers, 2017).

Postgraduates, already working as qualified radiographers said that:

> I think it's [research is] about people questioning why they're doing something (P14 PG Student)

> I think we do [research] all the time because it's part of your job (P13 PG Student)

From the postgraduate students there was a change of tone compared to undergraduate students, with a more positive attitude towards research as an integral part of their professional habitus. I have to acknowledge though that these students had chosen to undertake postgraduate study and those who participated were actively involved in writing research proposals with the intention of performing research for their MSc qualification, so they are currently involved in building their knowledge and experience in the four pillars of advanced practice. Hence, the responses of these radiographers, who say their habitus does include research, may not reflect the whole profession.

It appears that all participants were aware of research being an important part of the education of radiographers but for some, particularly undergraduate students; it seemed to be either something they *had* to do perhaps under duress or something other people would do. Bourdieu (1977) suggests that habitus changes over time, and while some staff and students see the need to incorporate these skills into their changing habitus not all can see this as necessary or possible. I have suggested that 'symbolic research capital' includes a spectrum of research activities, and staff seem to recognise that critical skills are important to a radiographer as a professional whether they *use* research to inform their practice, that is

pursue Evidence Based Practice, or *do* research in their role, or both. Some students concur with this belief, but others are suggesting that while research is important for the profession and patients, it is not for *people like them* in Bourdieusian terms. What is not clear is why this is, but I offer two explanations. Perhaps they felt that they were not capable of using or doing research because their habitus had not changed to include research even after their education, demonstrating a hysteresis effect that may change after a while in practice. Alternatively, they may be displaying their belief that they are not as good as others may be, in other words they feel they do not hold the same levels of capital as others. This may reflect their perception of a lack of embodiment of research within their habitus and a lack of confidence that they could ever attain higher levels of capital themselves. These students are, like other participants, aware of what might constitute 'symbolic research capital' but perhaps for them it seems unobtainable and they do not recognise that they are already active on the research spectrum by doing a degree.

For pre-degree trained radiographers, that is who qualified before 1993, there was an emphasis on rote learning (Hammick, 1995; Hogg et al., 2007) which has changed since the move to a degree qualification. One of the reasons for an increase in the number of radiographers confidently taking on advanced practice roles may, I believe, be related to an increase in radiographers questioning practice and thinking critically because of their degree training. As these advanced practice roles include a range of activities which happen remotely from the patient, the habitus of radiographers has shifted from what Hugman (1991) describes as only hands-on 'caring for' to now include more distant 'caring about' tasks such as reporting images. At the same time, I suggest that 'caring about' also encompasses how radiographers should think critically about the hands-on part of their role, which I would express as 'caring about how we care for' patients as the profession uses and increases its evidence base. Understanding what you do as a professional links the habitus to the field as I discuss in Section 4.5.2.1 (starting on page 138) with reference to 'button-pushers'.

4.5.1.1 Habitus of lecturers

Stacked images of participants' drawings and comments from CCDs within the sub-theme 'Habitus of Lecturers'

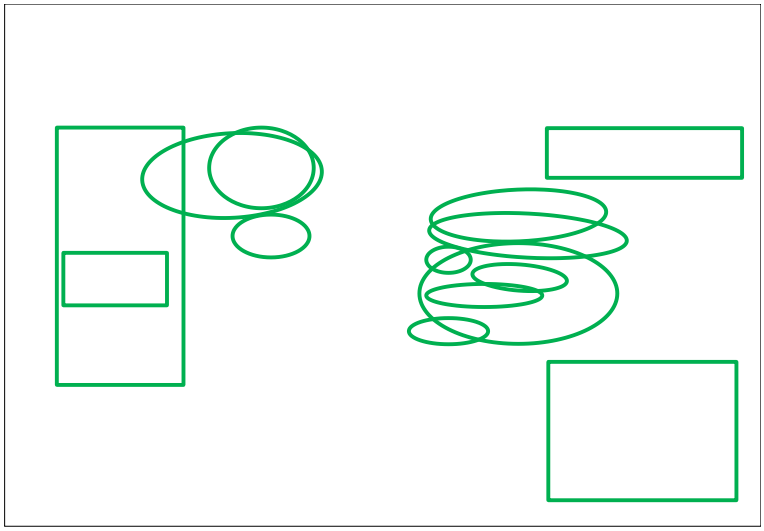


Figure 4:17 Students- Lecturers' experience

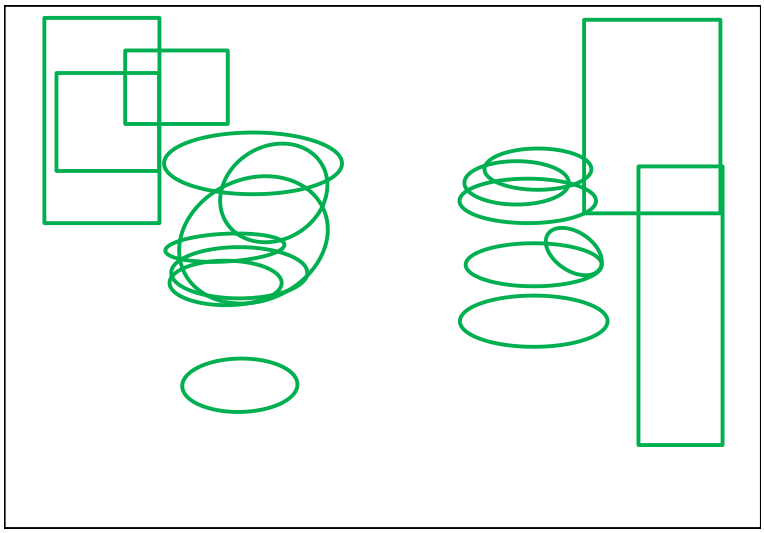


Figure 4:18 PG Students- Lecturers' experience

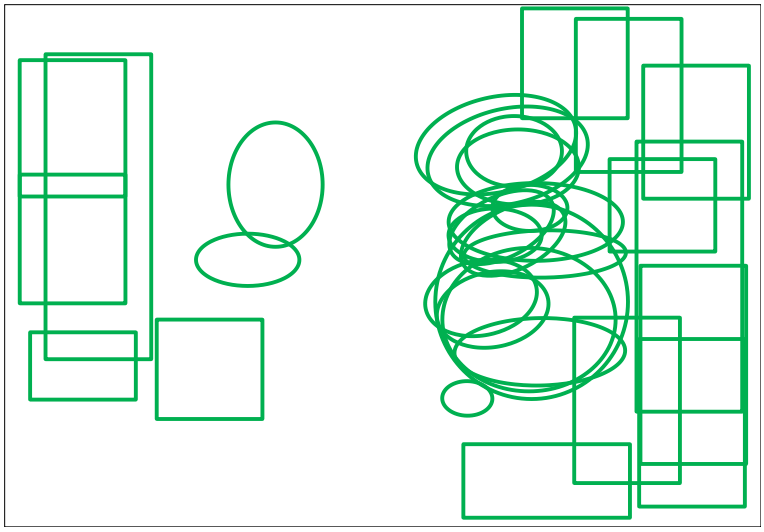


Figure 4:19 Staff- - Lecturers' experience

While my first drawing question, asking about why we teach research to radiographers, generated the most replies that I interpreted as pertaining to radiographer habitus, the second drawing question about influences on *how* we teach research elicited several responses about the skills, abilities and aptitudes of staff in this subject area as illustrated on the opposite page. For example, one student thought that that staff's previous experience had a bearing on their teaching, saying:

> …it's based on successes of how you have found past teaching, what works, your own successes…maybe how you were taught…put that one at the top [*suggesting it is an important point*] if lecturers are inspiring and enjoy themselves this is passed to students (P2 Student)

Initially I treated this type of comment as 'lecturer's experience' but realised that this is itself a manifestation of habitus. Bourdieu (1993: 15) describes the habitus as 'the durable ways of being or doing that are incorporated in bodies' which will include not only skills, abilities and aptitudes but also lecturers' own experiences of radiography and research. Students perceived that previous experience, particularly as a radiographer, as an important capital:

> It would be great if they had experience in radiography and had a PhD but as long as they have experience in radiography… (P11 Student)

> I think you guys probably try and make it more applicable to real life and that makes it more real (P19 Student)

These answers suggest that while skills and abilities to teach research as a subject are valued, it is just as important for lecturers to have good profession specific knowledge too, so they can relate the theoretical teaching to practice experience. Students may recognise symbolic academic capital in their lecturers, affording them respect for their professional knowledge or recognising them as 'people like us' in the professional field. Similarly, a lecturer's own 'symbolic research capital', an expression I have used to suggest a form of Bourdieusian symbolic capital, might be recognised:

> If the student sees that you're presenting internationally…you've got that kudos, haven't you? (P5 Staff)

This was suggested by one member of staff who also commented that when students know that lecturers still work clinically, they seem to have extra symbolic capital in the form of prestige, or recognition as an expert, when teaching practical skills and current practice, compared to those in the university no longer involved in clinical practice, who are viewed as only academics.

Some postgraduate students had experienced research teaching in a mixed disciplinary group and felt they had been disadvantaged in some ways if the lecturer did not have imaging profession specific knowledge to use when illustrating points about research in lectures, or when marking research assignments, saying:

> …lecturers that were doing it, teaching us [research], they didn't understand much about ultrasound [an imaging technique] so we kind of had to teach them a bit [about ultrasound] (P13 PG Student)

> …there are certain things that come up a lot in radiography that don't happen or that don't appear in other articles (P16 PG Student)

One member of staff clearly agreed during a discussion about who might be best placed to teach research to radiographers saying:

> I think anyone who's an experienced researcher to teach would be good, but they would lack the examples from practice to apply the research theory…it's tricky enough having to teach it to undergrad without landing a research professor from another professional group. I'm not sure that would be well received [by students] (P3 Staff)

These comments suggest that rather than teaching or learning research as a separate academic study, both staff and students thought we need to teach research as a practical, applied subject, to indicate relevance and authenticity in much the same way that we teach other subjects on the course in a practical, applied manner. This could help students to realise the relevance of what we teach to their future career, however it might lead to a narrowing outlook on the landscape of radiography research if we become too profession specific or methodology specific, in our thinking. For example, in my own experience of the professional doctorate, people who were not radiographers have taught me, and this has

helped me think differently about research and my profession that I feel has been an advantage, but I cannot deny that there have also been challenges for me. While I have embraced these challenges and enhanced my learning, my motivation as a part-time doctoral candidate might be different to that of an undergraduate student for whom the focus might be to pass modules, qualify and earn an income. It does however raise an interesting point that in addition to their perception of a *safe* learning environment with a radiographer academic, exposure to teachers from other disciplines could enhance students' learning. This is particularly relevant when non-imaging staff have different areas of expertise and interest in research from which our students might learn.

However, these comments could also be interpreted as expressions of defending the borders of a professional field. The students interviewed were at the end of their third year, so were about to become, in a similar manner to other participants, state registered radiography professionals. Using Bourdieu's theory of replacement of the concept of 'profession' with that of 'field', with boundaries that are defended, all participants may want radiographers to teach research because of their ability to illustrate principles in a way that can be understood in a particular professional discipline. But perhaps they are also trying to defend the profession's boundaries by keeping *others* out at the teaching interface, other professions that is.

Some staff were critically aware of their own limitations regarding teaching research because of their own lack of knowledge of the subject, citing for example:

> …our skills and our confidence in research as a team because I suspect most of us don't feel confident (P20 Staff)

> …some staff feel nervous about it because I think they were the students that also went through that [process of learning about research] and came out not feeling confident about research (P4 Staff)

A deficit in their personal 'symbolic research capital' is what staff are expressing here; identifying a shortfall in themselves and the team with regard to our experience in doing and

teaching research while simultaneously misrecognising the skills they do have on a research spectrum. They perceive a mismatch between their habitus and the requirements of full engagement in the academic sub-field of radiography that could be addressed:

> …if we were all more research active, we could apply our research into our learning (P20 Staff)

However, regardless of how much 'symbolic research capital' is held by some of the staff, there are others for whom research activity is not of interest, so there is a risk that students will learn a similar attitude since:

> …if we're not interested in it, it comes across that way (P6 Staff).

There is an expectation in higher education that lecturers will hold a doctoral degree, and the number of radiographer educators having doctoral degrees is increasing, but it is not an opportunity granted to, or taken up by everyone. A possible consequence of this expectation is that there might come a point where radiography staff without a higher degree are excluded from undergraduate research supervision, but this would be to the detriment of staff and student learning as supervision is itself a learning process for the supervisor as well as the supervisee. Ultimately, a lecturer's value is equivalent to more than the sum of their 'symbolic research capital' and their educational capital, but these two might need to be demonstrated in equal quantities to fulfil the students' expressed desires for an educator who is both a radiographer *and* a research practitioner.

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4.5.1.2 Student constraints- Habitus

Stacked images of participants' drawings and comments from the CCDs within the sub-theme 'Student constraints'

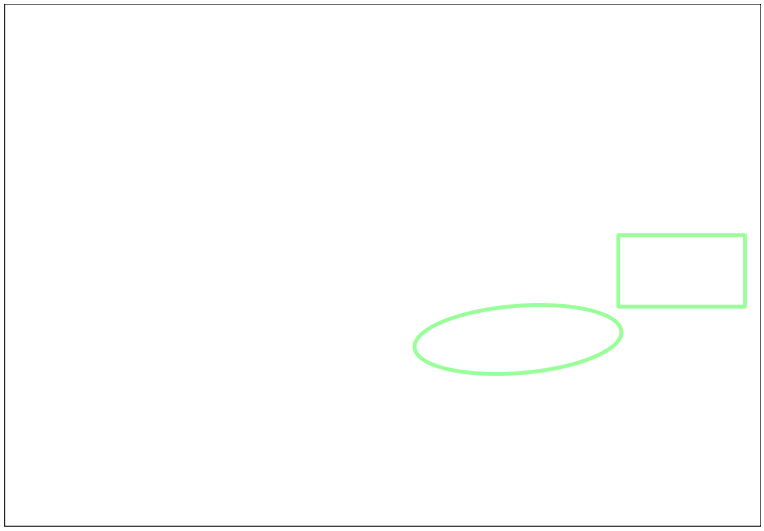

Figure 4:20 Students- Student constraints

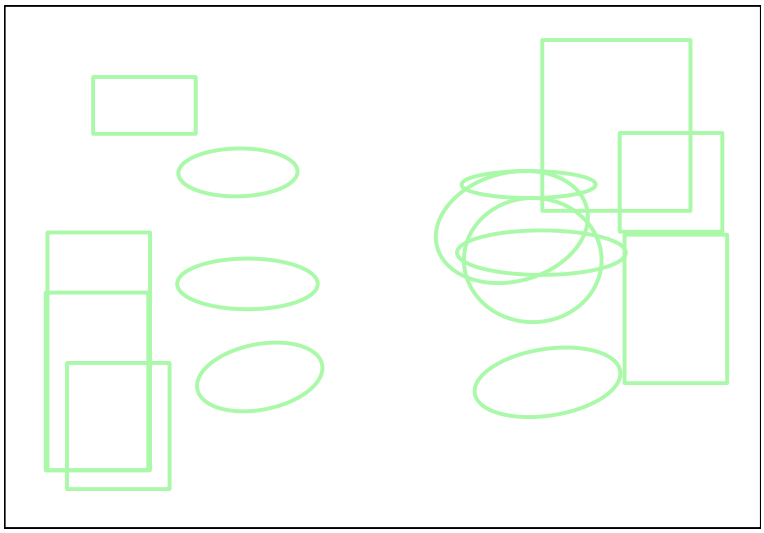

Figure 4:21 PG Students- Student constraints

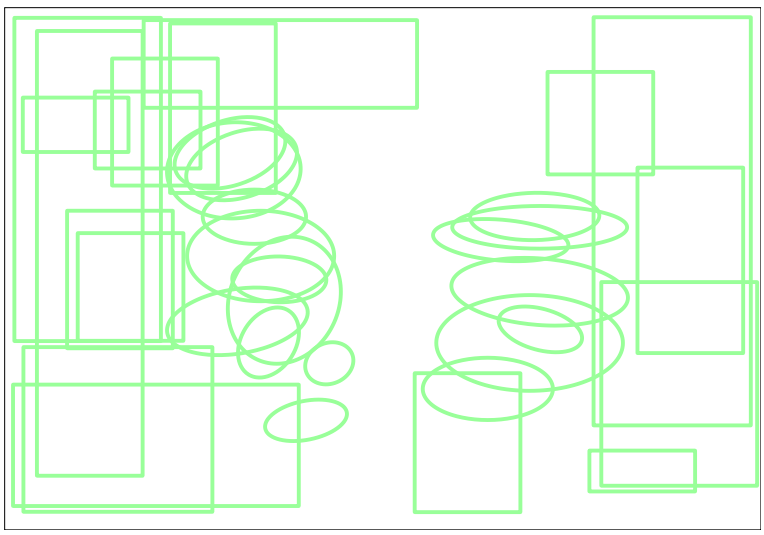

Figure 4:22 Staff- Student constraints

The next sub-theme for consideration under the overarching theme of habitus is ‘student constraints’. This sub-theme developed from staff comments about how students approach the subjects of research and learning, and it is clear from the stacked images opposite, a *punctum* even, that staff had much more to say on this than the other groups of participants. These were mostly concerned with what staff perceived as students’ lack of ability and confidence academically and lack of appreciation of the relevance of research to themselves.

Staff commented that they felt students regarded the third-year research module as the only place they saw research embedded in the curriculum, and then often in a negative way. Staff suggested that students themselves think of the research module as a necessity on the way to qualifying as a radiographer not as becoming an integral part of their habitus, saying for example:

> …the third year gets loaded on and then it's just another assignment and they've got to jump through the hoops to pass (P9 Staff)

> …it's just a hoop to jump through isn't it I've [the student] got to do this to get my degree and I’ll never use it again (P20 Staff)

In some ways this is true, as the research proposal module contributes to the 120 Level 6 credits needed for conferral of the appellation ‘Hons.’ in this university. As this is the required level of qualification for registration with the HCPC (HCPC, 2017) to practise as a radiographer, the research module *must* be completed successfully. However, the response from staff suggested a negative attitude from students who found the module necessary, but a burden on their time.

To try to explain where this attitude might have come from, or how history has written itself on their habitus, it might be useful to look at the background of radiography teaching staff themselves. In this department, all the staff have practised clinically for several years before entering teaching, which for some may have affected their attitudes towards research. Jackson (2013) made little mention of research in his thesis on radiographer education while

Baird (1996) discussed the difficulties students have in reconciling their classroom knowledge with their work in the practicum. This suggests a disjoint in thought between staff in the university and those in practice. There may be a hysteresis or lag in confidence with research for formerly clinical staff, coming from an environment where research may be poorly understood or poorly enacted, compared to an academic environment where research is visibly more important. This is unlike lecturers in some other subjects who may have been in academia, gaining higher degrees and doctorates, before coming to teach, but having little experience of working in their field of practice. For those staff, research confidence may be higher than for ours. Meanwhile students may also be aware of the apparent disconnection between what they see and hear with reference to research in clinical practice, and what they hear in the university. It may seem that research is not important once they qualify due to the pressures of the work, where they will need to be fully engaged in working through lists of patients with no time to consider anything else. One member of staff suggested that this was happening, where clinical staff who had previously tried to engage in research and had faced rejection might pass that negativity 'down the line' towards newly qualified staff and students (P8 Staff).

The second strand to discuss here is the staff perception of the abilities of students, for example:

> …we don't have overly academic students and I think that must influence how we teach it (P20 Staff)

> I think they need the didactic 'this is how you do things' (P5 Staff)

Several staff mentioned the low level of skills students have as they arrive on the course and the social circumstances of some that make studying difficult; describing here aspects of students' habitus. While staff are mindful of differing needs of students, there may be an element of what Bourdieu describes as 'symbolic violence' (Bourdieu and Wacquant, 1992) in evidence here which describes the way individuals are limited in some way through being treated differently by a dominant group. For radiography, the dominant groups could be

educators, both academic and clinical, when compared to students, or individuals within the field of radiography who may be perceived as dominant because of the symbolic capital they hold.

The consequences of this situation may be that we are limiting students' aspirations by assuming they cannot do well. Staff may label some, or all, students as less able as demonstrated by the comments opposite. If we then teach them with low expectations of their attainment, there is no message to the students that they could do better which, as I explained above, may have an adverse effect on students' confidence. This may be related to staff habitus, through their lack of confidence in their research abilities, as they may not be sure what excellence in research pedagogy and supervision looks like. This may be the result of not having experienced it themselves and thus not be aware of the disservice they are doing their students by assuming they have low abilities. Meanwhile the students are allowing themselves to be victims of symbolic violence by assuming they need not do any better. I accept that this is only one possible explanation of what is happening, based on a small sample of staff and students, but it is concerning that there seems to be a feeling from both sides that research teaching and learning is a burden, is 'not for us', and is too difficult to change. However, low confidence is not a good excuse for teachers who are not attempting to improve their own confidence perhaps with learning or reading, so increasing their own contribution to the profession's 'symbolic research capital' but perhaps they misrecognise their own abilities.

Overall, staff think the research module in the third year is a hurdle for students, which they find difficult to execute successfully, and to students it seems to be irrelevant for their future practice. Few students mentioned themes which might be considered 'student constraints' but one felt that third year students found it 'uncomfortable' to write a substantial assessment for the research module, with one postgraduate student recalling their third-year project as 'extremely painful'. While learning a new subject may feel difficult, students' lack of confidence in their abilities may be adding to their negative feelings, which I suggest may

have been influenced by the doxic position of helplessness in the face of research caused by symbolic violence enacted on them by education and clinical staff. This may be due to a lack of role models to whom others might look for inspiration. As Snaith (2013) and Harris (2016) noted, most radiography research is conducted by a small portion of the profession, and most of these researchers are academics, rather than clinical radiographers. Hence, staff or students can draw for inspiration on few role models. This adds to the othering of research, as something 'other people' do but not ourselves, which I aim to change by further embedding research in the curriculum so it is a normal part of learning and hence a normal part of being a radiographer, so enabling the role models of the future.

In this section, I suggest that teaching staff's attitudes towards, and enthusiasm for research influences students. This may be having a negative effect on students who are learning this attitude from some university staff. This links back to the comments in the previous section about some students' perceptions of their own lack of ability or confidence to do research. This may stem from a form of symbolic violence being enacted upon students by both academic and clinical staff, as some of them, who find research difficult, transmit this poverty of personal 'symbolic research capital' as something which is normal, meaning research is 'not for people like us'. Instead if research could become the normal thing to do, and very much for 'people like us', then it would become doxic, a positive part of the normal taken-for-granted part of being a radiographer. I discuss the normalising of research in Section 4.5.5.2 (starting on page 162).

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4.5.1.3 Hit the ground running

Stacked images of participants' drawings and comments from CCDs within the sub-theme 'Hit the ground running'

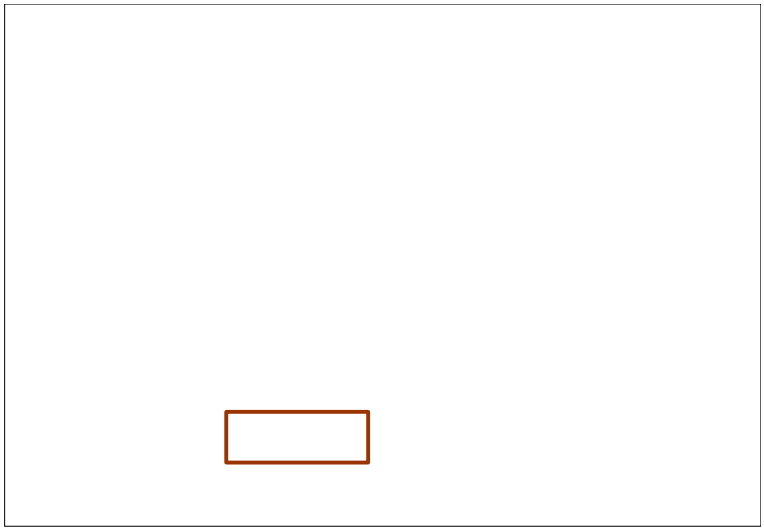

Figure 4:23 Students- Hit the ground running

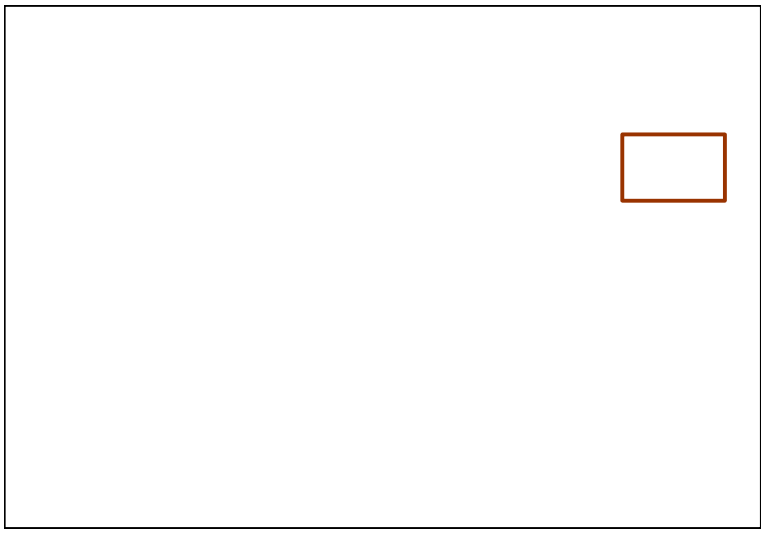

Figure 4:24 PG Students- Hit the ground running

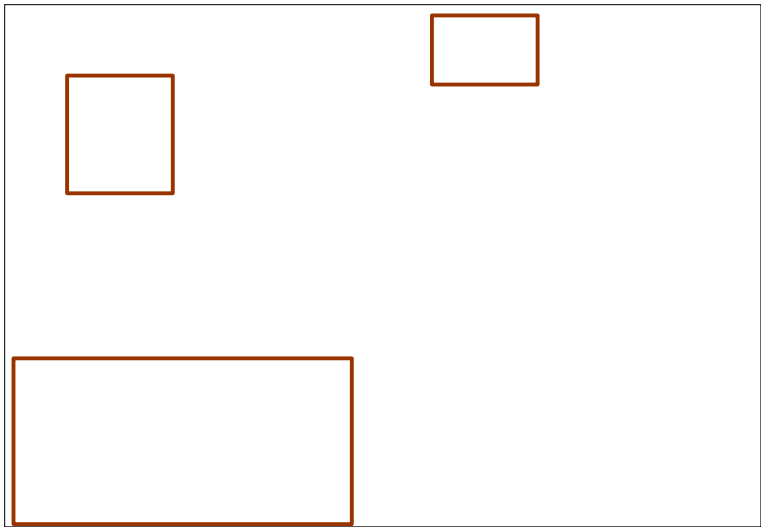

Figure 4:25 Staff- Hit the ground running

As can be seen in the previous images, there were few comments that fit in this sub-theme, ‘Hit the ground running’ but it does illustrate one of the dichotomies between clinical and educational radiographers. It is named after a comment from one of the postgraduate students who said:

> When somebody qualifies you want them to hit the ground running (P14 PG Student)

In this context the expression ‘hit the ground running’ means ready immediately on qualifying to be able to work as a team member in the clinical setting, thus able to perform medical imaging or treatments straight away. In this situation, newly qualified radiographers have to use those parts of their new habitus that are concerned with the physical work of imaging and their interpersonal skills perhaps to the detriment of their critical skills. This theme develops an aspect of the above discussion about the difference in expectations between academics and clinical staff with reference to research but focuses on the constraints in the clinical workplace that may stop staff doing research.

Payne and Nixon (2001) used a similar term ‘hits the floor running’ (Payne and Nixon, 2001: 249) as did Jackson (2013) to describe their perceptions of what clinical departments need of a newly qualified radiographer. The suggestion from the participants in this study was that the workload in clinical departments is such that there is no time for staff to conduct research. Although workload may not have a single physical presence being made of many patient bodies, in its ‘intra-activity’ (Barad, 2003: 827) with staff has an effect, that is agency, which affects radiographers’ working conditions. This situation is not aided by underfunding of the NHS and difficulties in recruitment and retention of staff, meaning there is neither the capacity nor funding for many research projects which Challen et al. (1996), Whiting (2009a) and Harris and Paterson (2016) all identified as barriers to research. The possibility of staff doing research is also dependent on the culture within a department. As students spend almost half their training in clinical placement, it may be inevitable that they will pick up some of this attitude and so question the relevance of learning about research.

Some student participants had a low expectation of having opportunities to be involved in research, suggesting that it is an activity for radiographers at higher pay band levels than they would be as newly qualified radiographers. For them, it seemed their personal habitus did not need to include research, as that was something that other people did. However, many radiographers do train to become advanced practitioners and then need research skills as one of the four pillars of advanced practice, so this might be a short-term coping strategy while they learn the practical part of the job, before being ready to progress.

'Hit the ground running' suggests that students are expected to take on the habitus of a qualified radiographer very quickly after qualifying and securing their first job. This is the period when they become a full member of, or player in, the professional field (Bourdieu and Wacquant, 1992), when they find out the reality of working in the profession and their position in the field.

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4.5.2 Professional Field

4.5.2.1 Profession oriented

Stacked images of participants' drawings and comments from CCDs within the sub-theme 'Profession oriented'

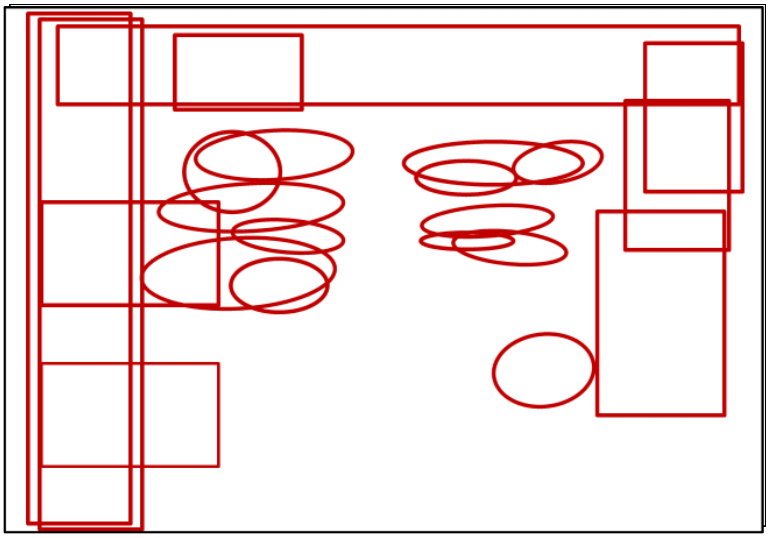

Figure 4:26 Students- Professional Field

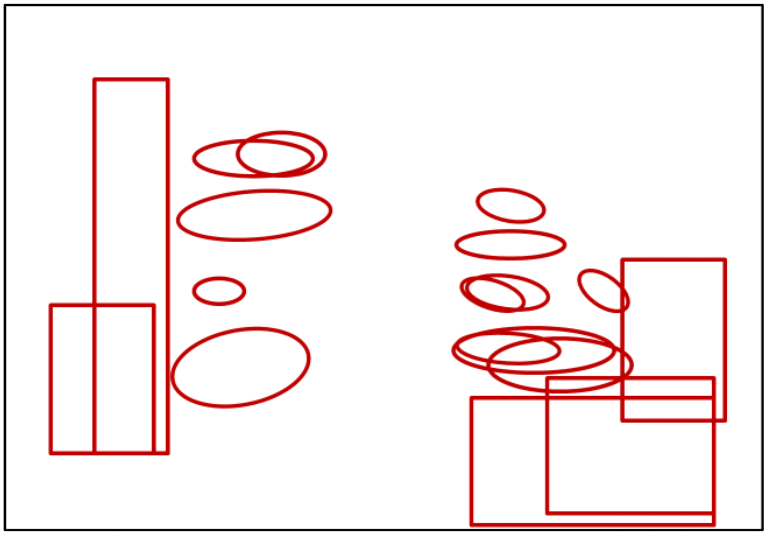

Figure 4:27 PG Students- Professional Field

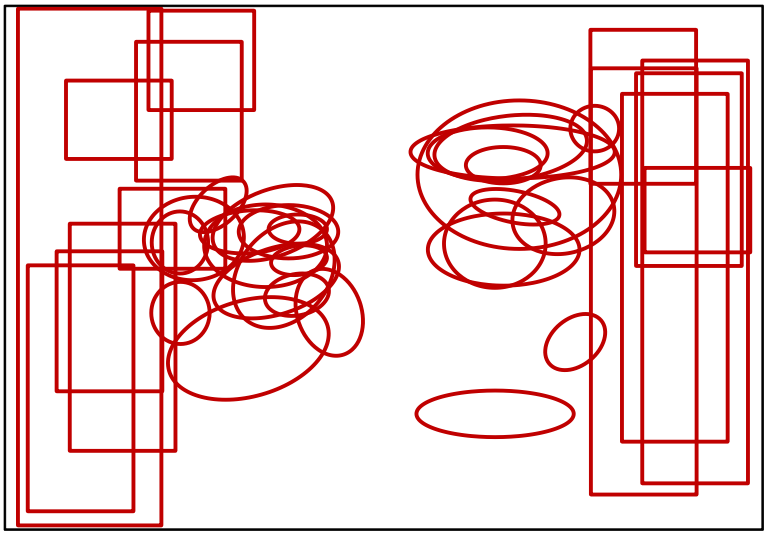

Figure 4:28 Staff- Professional Field

This theme developed at the nexus between Bourdieu's concept of professions as fields (1968) and the SCoR's stated desires to advance the profession of radiography for the benefit of patients (Society and College of Radiographers, 2015a). The sub themes of 'Professional field' and 'Patient oriented' sit within this theme because patients, their bodies, are at the heart of radiography practice.

I did not prompt participants to talk about the links between research and the profession, but all participants commented at some point about their awareness of the importance of research for the radiography profession and as can be seen in the images for this section many comments fit in this sub-theme. Interestingly there was no suggestion that radiography was anything but a profession, not a job or a trade or even in the process of professionalisation. Instead, both students and staff clearly used the word 'profession' to describe radiography when talking about the importance of research for example:

> … [it's the] main way for us to promote and push our profession forward (P5 Staff)

> …to be taken seriously as a profession we need to have a body of evidence behind us for everything that we do (P8 Staff)

These lecturers were advocating research and evidence-based practice as essential for the profession, which I have suggested are within the spectrum of 'symbolic research capital', although it is was not clear who should be taking us seriously. There was an acknowledgement by other participants that there has been change over the years for the profession. The earliest use of the term 'button pushers' I found was in Furby's writing in 1944 (Furby, 1944) and this expression has stuck as a pejorative term particularly for diagnostic radiographers. Several participants used the term when talking about the profession, suggesting that radiographers are more than just 'button pushers' using language which I interpret as being about 'symbolic research capital' now being present within the profession. This is an idea I have previously discussed in relation to Bourdieu's

(1992) concept of professional fields, where the importance of symbolic capital, including what I describe as 'symbolic research capital' was suggested.

'Symbolic research capital' was alluded to as one of the reasons why radiography was seen as a profession, both in the two quotes above and for example the suggestion that it:

> …maintains that we are a respectable profession with thinkers not just doers (P9 Staff).

The use of the word 'respectable' seems to mean a profession respected by others *as* a profession, rather than one trying to escape dubious origins. This suggests a profession with visible symbolic capital, such as 'symbolic research capital' which includes researchers, their output and the use of their output that can be seen and recognised by others, and 'maintains' (P9 Staff) our position. This participant made further comments on the idea of being 'thinkers not just doers' saying:

> …to keep in line with other professions [if] radiographers weren't [doing research] then probably someone else might fill in that gap so perhaps that [doing research] might get taken over by doctors or something and then we would just be button pushes still (P9 Staff)

Not only do radiographers need to 'think' by producing and using research, the suggestion here is that if we do not, then other professions 'doctors or something' meaning other allied health professions perhaps, might attack the radiography professions' field boundaries by doing research within the radiography domain, rendering us mere 'button-pushers' that is, 'doers'. If we do not think about what we are doing, another professional group may have chance to take over and tell us what to do. Others talked about the global position of radiography, and its standing in relation to other health professions, both medical and non-medical. Again, the emphasis was on defining radiography as a profession in its own right, which aligns with the concept of doing professional field boundary work (Bourdieu and Wacquant, 1992) and keeping *others* out.

Although research and professionalism are linked for radiographers, this might be more aspirational than realistic unless these concepts are more firmly embedded within the

profession, starting with radiographers' education. As discussed above, clinical departments need radiographers who can run lists efficiently, 'hit the ground running' on qualification and may have little time practically for research activities. The SCoR aims (2015a) to increase research activity by increasing awareness throughout the profession are dependent on the whole profession supporting them. From my perspective as an educator, it is important to enthuse students about research to enable them to overcome the inertia or hysteresis they may encounter in clinical practice and so change the shape of the profession in the future.

4.5.2.2 Patient oriented

Stacked images of participants' drawings and comments from CCDs within the sub-theme 'Patient Oriented'

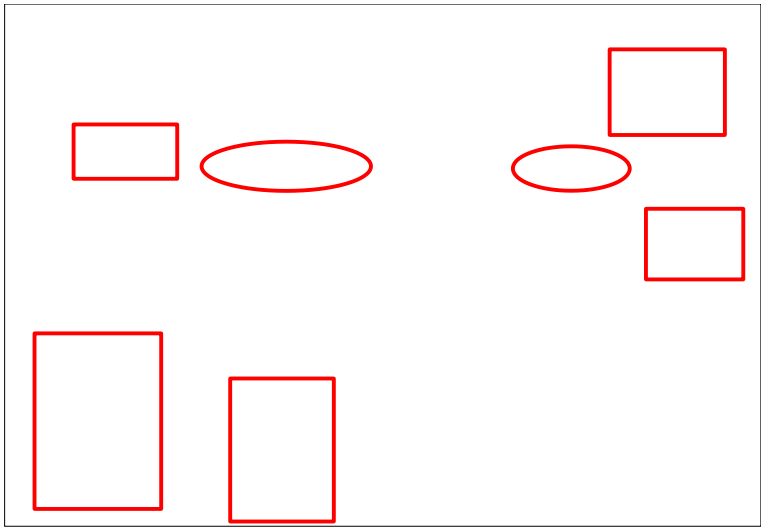

Figure 4:29 Students- Patient oriented

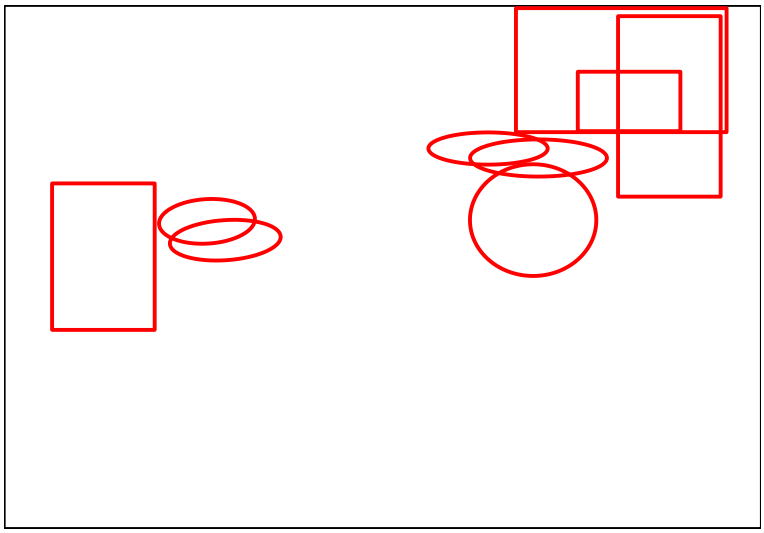

Figure 4:30 PG Students- Patient oriented

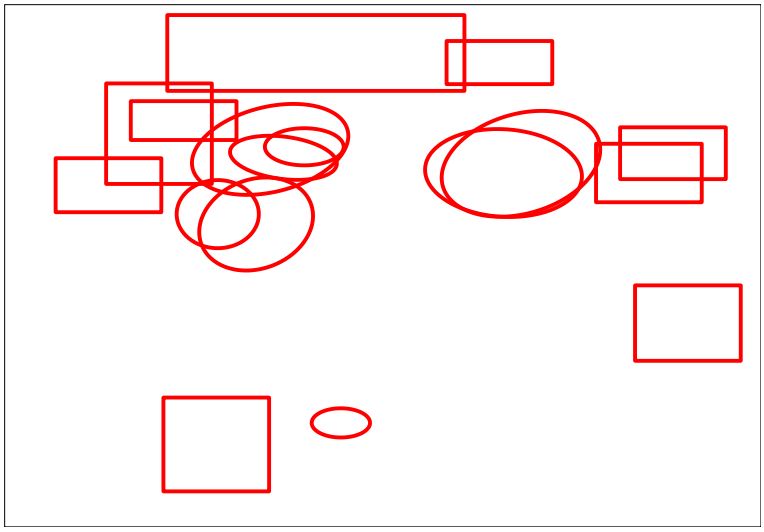

Figure 4:31 Staff- Patient oriented

As shown in the images here, radiographers as health care professionals and students, perhaps unsurprisingly mentioned patient care in the context of improvement through research as radiography is a patient-oriented health profession, concerned with 'caring for' (Hugman, 1991) patients during imaging and 'caring about' patients in other roles. Participants in all groups made comments that research was needed, for example:

> …to improve the patient care and the patient safety (P11 Student)
>
> …improve and innovate [patient care] (P10 Postgraduate Student)
>
> …the most important is that we've got this evidence of best practice to inform our patient care (P5 Staff)

However, although the patient was considered, there were fewer comments made about patients than those that I interpreted as being about habitus and professional field. I have previously made clear that I am aware that I am entangled (Barad, 2007) in the research process. Therefore, I acknowledge that this disparity in the comments may reflect the type of questions I was asking, and my overt role as an educator interested in research pedagogy. However, I find this lack of responses about patients to my question asking *why* do we teach research to radiographers, is more surprising than the responses given in the section above related to profession, since that was not directly mentioned by me either but there were many responses which fell into that theme. This paradox mirrors the content of the SCoR (2015a) *Research Strategy*. There is a clear message in the document about the benefits of research for patients since Aim 2 is to, 'Raise the impact and profile of radiography through high quality research focussed on improving patient care and/or service delivery' (2015: 1). Similarly, in the latest strategy planning document 'Raise the impact of radiography world-wide through patient focussed research' (Society and College of Radiographers, 2018). However, as can be seen from the wording, the perceived benefits to patients are intrinsically linked with raising the profile or status of the profession but comes later in the sentence. While this positioning may have no significance, it seems to me that for a relatively new profession, for whom the whole spectrum of 'symbolic research capital' is a more recent

issue than caring for patients, it is possible that in a similar way to the SCoR documents, my participants perceive patient care as a *taken for granted* part of the work of the profession. Bourdieu (1984) talks about the *doxa*, meaning things which are self-evident, and patient care may be seen as self-evident by a radiographer, whereas because of the more recent emphasis, and the scope of my questioning, research is seen as novel and therefore thought-provoking in the interview setting.

As a diagnostic radiographer, I am more familiar with clinical practice for this part of the profession so acknowledge that the following interpretation is strongly influenced by my practice experience. However, I want to explore further the doxic position expressed above in which patient care is taken for granted and the concept that the radiographer's output in the form of an image is considered central. For diagnostic radiographers, producing an image is the lasting part of each patient interaction: producing an image of the body. Our time with the patient is often short, but what endures is the image produced through the interaction of the patient's body, the technology and the radiographer's expertise. Barthes writes about photography and I have previously used his ideas and applied them to my research. He proposes three 'practices' to image making: 'to do, to undergo, to look' (Barthes, 1982: 9). In radiography, these equate to the radiographer, the patient and then anyone who looks at the image. The radiographer and the patient move on but the image itself, which represents a single moment on time, lives on through time, to be looked at by whoever sees the image from then on, from someone who reports the image, to its use in clinical situations or teaching, long after the radiographer's original contact with the patient.

Reeves (2008) while arguing for a research base that should have a patient focus suggests that the enduring image is important to radiographer, saying:

> The problem with diagnostic radiography is that, whilst we may pay lip service to a patient-centred culture, the real focus of practice is the image not the patient. (Reeves, 2008: 62)

Reeves continues, suggesting that the research done by radiographers at the time reflected this attitude, with much research devoted to radiographer reporting of images. Later, Reeves and Decker (2012) explored the concept of radiographers distancing themselves from patients. They suggest that this may be based on three things, partly on the short-term interactions between patient and radiographer which, by the nature of diagnostic imaging is often an interaction lasting only minutes after which the patient may not be seen again, partly on the technology used as an integral part of the encounter, and partly by the task nature of the interaction that is the production of an image. This echoes Barthes, as in 'to do, to undergo, to look' but with more emphasis on what is looked *at* being the most important part of the encounter, the 'what has been' (Barthes, 1982: 77). Similarly, Strudwick (2014) describes the image as the product and record of the radiographer's interaction with the patient rather than an effect on the patients themselves. The centrality of the image also arises because the radiographer's quality of work is clear for all to see and discuss objectively, rather than being a more subjective assessment as might happen for other allied health professionals. For example, a physiotherapist might treat a patient, but it might be difficult to gauge the effectiveness of the treatment and there would be nothing visual to discuss immediately or later, as there is for radiographers and the permanent images they produce. Strudwick is suggesting that because the image itself comes under scrutiny, the performance of the radiographer is likewise under scrutiny. I interpret this to mean that radiographers may be so concerned with the image as a mirror of performance that the patients themselves becomes less important as a focus of concern, which is not a desirable situation.

Further to the discussions on distancing between radiographers and patients, Reeves and Decker (2012) suggest that distancing is mediated to some degree by touch during an examination. However, while it is almost impossible to produce the image without physical touch, it is mainly used to aid the radiographer in correctly positioning the patient. Such touching, which Schroeder et al. (2017) call 'functional intimacy', goes beyond the normal

socially acceptable level of intimacy between strangers. This could lead to the patient and the radiographer distancing themselves psychologically from one another to avoid crossing an invisible boundary into unacceptable intimacy.

Although the SOR has produced guidelines on intimate examinations (Society of Radiographers, 2016) in which there is acknowledgement that *intimate* will have different meanings for different patients, and that consent should be gained before any touch, there is little other literature relating to radiography and the necessary touch for positioning which is an avenue for further research. This discussion of what may be considered invasive touch is tempered however by the use of touch as an acceptable social phenomenon related to showing compassion and empathy (Reeves and Decker, 2012) at a potentially distressing time for the patient.

Overall, the patient may be perceived by the radiographer as a normal part of the imaging process, during which care is taken on both sides to avoid overstepping the boundaries of bodily contact during the examination, thus mediating the emotional intimacy between patient and radiographer. Similarly, while the patient is of course part of the imaging process the product, which is the image, is a measurable indicator of our expertise and is open to judgement by others. However, *of course* we care for the patients, it is in our habitus to such an extent that it becomes part of the *doxa*, that which goes without saying.

As discussed in this section, participants were aware of the benefits of research on patient care and radiation safety, but apart from two participants who mentioned ‘technology’ no other participants mentioned the machines and technology we work with. They said:

> …technology is always changing (P14 Postgraduate Student)

> I think if the research wasn't there then we will probably be back in the Stone Ages essentially so it's a brilliant way to actually advance the profession as well, advanced technology (P11 Student)

Considering that a radiographer cannot perform their role without equipment, it is perhaps surprising that no further mention was made of research and technology; however, there

may be two possible explanations for this. The first is that, as radiographers may feel the equipment is an extension of themselves, in a cyborgian fashion, where machine and human become as one in Freund's (2004) 'technological habitus'. Secondly a phenomenon called 'black boxing', first used with respect to medical imaging in the early twentieth century may be occurring (Latour, 2005; Pasveer, 1989). This suggests that the technology 'just works' without radiographers thinking about how or why it works each time they use it. Although radiography students are taught about how the equipment works, in practice most equipment and technology research is not carried out by radiographers, so this might be less in their thoughts in relation to research, compared to their thoughts about using the equipment for patient care, and about safety.

Patient care and advances in medical imaging for the benefit of patients is the main reason research in radiography is done, and I have acknowledged my entanglement in the research through the questions I asked and offered explanations for the level of participant comments, which were patient oriented on this occasion. I was surprised that patients, *people*, were not more central to radiographers thinking in relation to research, but perhaps it is because caring for patients is 'what we do'.

4.5.3 Influences

Stacked images of participants' drawings and comments from CCDs within the sub-theme 'Influences'

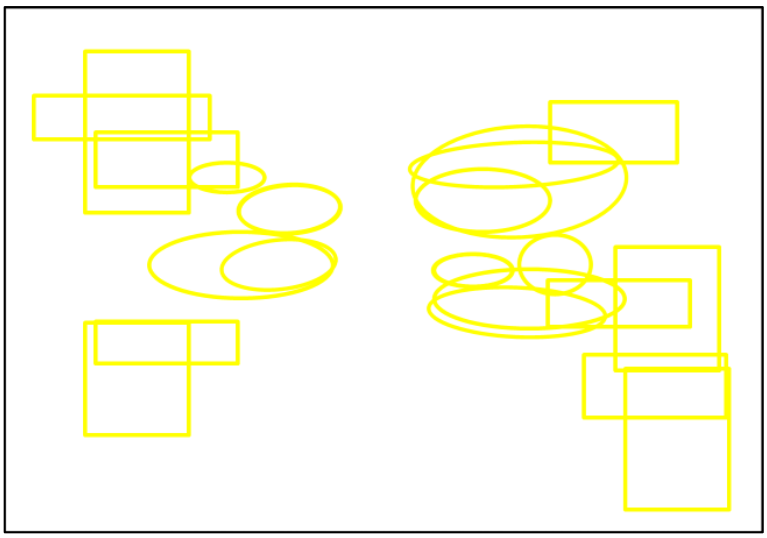

Figure 4:32 Students- Influences

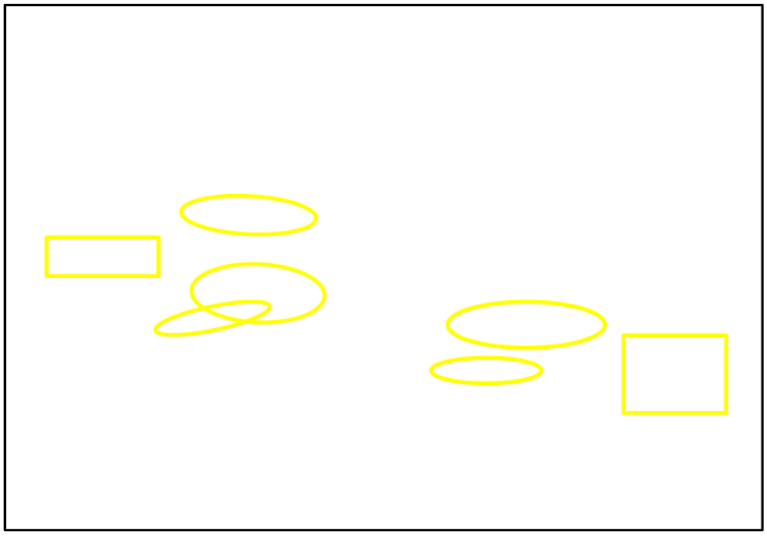

Figure 4:33 PG Students- Influences

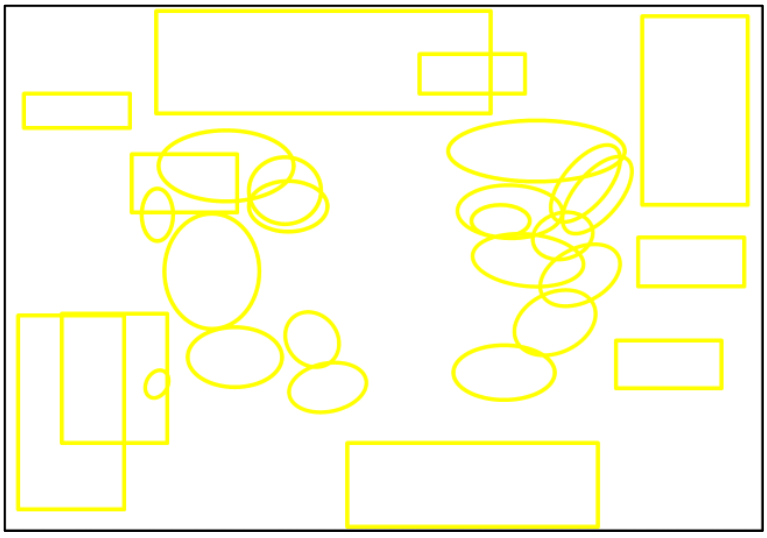

Figure 4:34 Staff- Influences

In this research, I wanted to discover what influences and constraints participants thought there were in relation to teaching research to radiographers, and the influences are shown pictorially opposite. The constraints form a separate theme below, while this theme of Influences is discussed next.

Regarding external influences on research teaching and radiography, there was a wide range of answers that included professional bodies such as the SCoR and HCPC. In addition, participants mentioned university policies and external examiner input on what we teach. I expected to hear these influences mentioned and it is noticeable, in Figure 4:34 opposite, that although there were more staff than student participants, still the picture emerges of more awareness by staff than students of these influences on our teaching, as shown by the higher density of shapes on the image. This reflects the way we encounter these influences regularly in our work and it is clear that lecturers were aware of the effect on teaching of external objects in the form of policies.

Thinking about the influences by policies on how we teach brings me back to Barad (2003) who says, matter, meaning the nonhuman, becomes ‘an active participant in the world’s becoming’ (Barad, 2003: 803) in other words she says, ‘matter matters’ (Barad, 2003: 803) and the nonhuman has agency in the moment it interacts with humans. Similarly, Latour (2005), in his development of actor-network theory suggests that objects have a role to play in social interactions, since they act as ‘participants in the course of action’ (Latour 2005: 71). They do not themselves determine or cause action, but have a role to play in the action, which may be a felt immediately such as a hammer used to hit a nail, or a policy used to make changes in actions at a distance, either spatially or temporally. This is just as the SCoR (2015a) *Research Strategy* is in ‘intra-activity’ with me, prompting not least, my course of action to perform this research. Like Barad, Latour is suggesting that matter or nonhumans have agency, *as they take part in actions*. I agree here that things do not have

agency in themselves but can be perceived by humans to seem to have agency in an interaction. Using the example of a policy, it may seem to make humans act in a particular way, but the policy itself does not have agency, as that resides within the human originator of the policy. The policy itself is thus an enactment or transmission of another's agency. So, matter matters because of its effect on humans at the point of 'intra-activity', but not because of its own agency. To borrow from Bourdieu's work on symbolic capital (1992), policies could thus be said to have symbolic agency.

The 'intra-activity' of nonhuman elements was important in my research since I expected to hear participants talk about nonhuman influences such as policies, rules and regulations on how and what we teach but beyond mentioning the professional bodies and university policies in a general way, most participants did not talk at length about policies. I could perhaps have probed deeper, asking further questions about external influences and policies, but I was worried that participants might feel that the interview had turned into an oral test at this point, which could have weakened the trust between us, perhaps adding an attitude of defensiveness to our discussions. Overall, many of the influences I had thought about were mentioned, but little depth of answers was realised.

Within this theme was a strand of ideas from students and staff about the links between research and higher education for example:

> … [there is] an associated link isn't there between higher education and universities and the conflated idea that that must involve research (P6 Staff)
>
> …you can't do a degree without doing research (P20 Staff)
>
> …because it's an honours degree in the curriculum (P11 Student)

With the change to a degree course in 1993 (Price, 2009) radiography education started to include research, as discussed in section 2.5.1 (starting on page 40). Currently the requirement to enter the HCPC register, which is a requirement for practice, is an honours degree. The findings suggest that participants are aware of this link, from degree, to

research and on to registration. However, research is perhaps seen as a requirement for the degree qualification, as a necessary part of a higher education, rather than an end in itself, being ‘a hoop to jump through’ as mentioned before. However, P11 Student suggested that having an honours degree was best practice and all students should qualify with this level of knowledge. This student was enthusiastic about research, and unlike others as previously discussed, did see research as something they would do in future.

Only one student participant mentioned the NHS, in the context of funding, as an influence on how we teach research to radiographers. The NHS bursary scheme was discontinued in England in 2017 and replaced with student loans for health care students, but this student had been bursaried. They suggested that the NHS might have an influence on teaching because they were funding students. This is not directly the case, but Health Education England does have an influence on training and education and until April 2018, the Higher Education Funding Council for England dealt with funding for universities and students. Certainly, the NHS has an influence on research, both in the promotion of research activity through the National Institute for Health Research (NIHR) and on ethical approvals for research through the Research Ethics Service scheme. The influence, that is the ‘intra-activity’ between the NHS and radiography education is therefore not direct, but the course has to be approved by professional bodies, both the SCoR and the HCPC whose guidance and protocols result in radiographers qualifying as fit to practice, with most of them working in the NHS. Therefore, the NHS influence is more indirect than the professional bodies, and not as direct as this student supposed.

The student voice, in terms of feedback, was not mentioned by many participants, but students in particular believed it influenced staff teaching. Again, the answers may have been influenced by the questions I asked, and it could be construed from the findings as concerning that staff did not consider student feedback. As one of my questions was about influences on *how* we teach, I expected more responses in this theme. I have discussed earlier (in Section 4.5.1.2 starting on page 128) ‘student constraints’ by which staff meant

how we teach being influenced by student habitus and for them this may have been implicit feedback, so they did not mention it specifically.

The students I interviewed were almost at the end of their third year, so were all eligible to take part in the National Student Survey that year. The publicity within the university and the department about this, combined with regular emails from the survey organisers may have made them particularly aware of student feedback and its importance at this time.

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4.5.4 Constraints

Stacked images of participants' drawings and comments from CCDs within the theme 'Constraints'

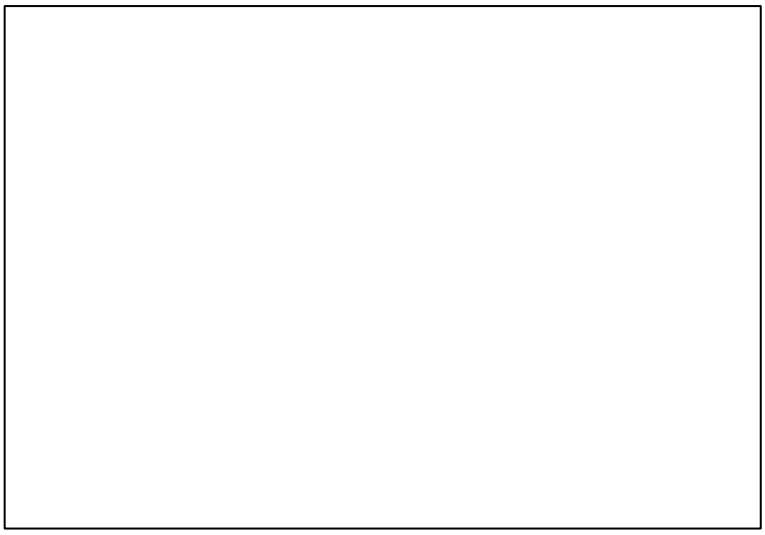

Figure 4:35 Students- Constraints

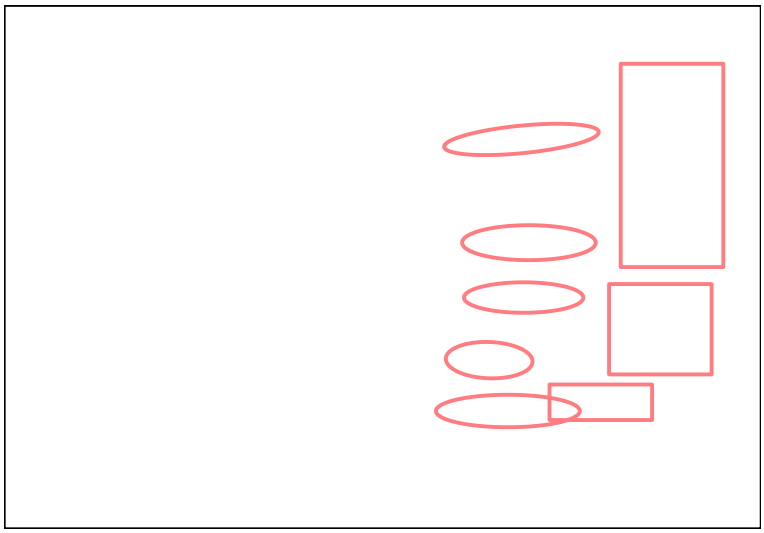

Figure 4:36 PG Students- Constraints

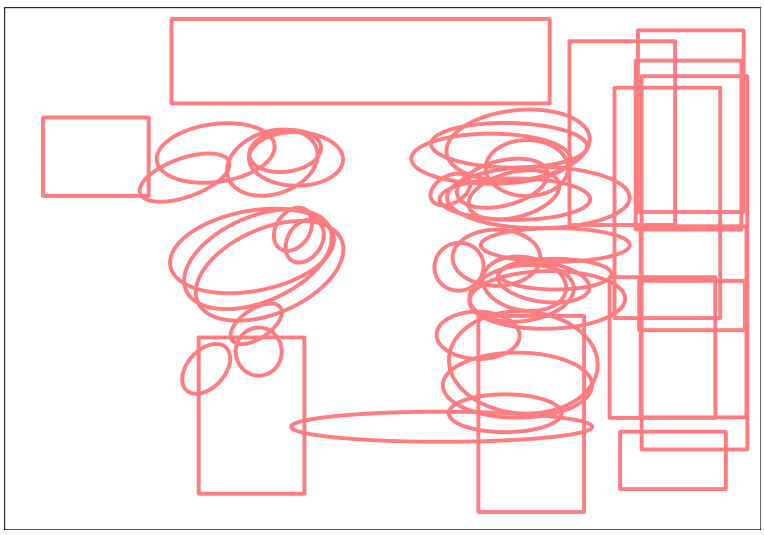

Figure 4:37 Staff- Constraints

This theme highlights all the nonhuman constraints on teaching research to radiographers mentioned by participants. This included subjects such as rooms, timetables and other practical issues where 'matter' in its 'intra-activity' with humans mattered (Barad, 2007). Human constraints have been included in discussions about habitus in Section 4.5.1 (starting on page 116).

The theme 'constraints' brings together what participants thought were difficulties faced by staff in delivering teaching of research, when answering DRAWING 2 Question 'What are the influences on HOW we teach research to radiographers at this university?' Ideas for this theme mainly came from staff and postgraduate students, while undergraduate students did not make any comments that I felt fell within this theme. For staff the comments were in two main areas, one concerning general teaching constraints, and the other constraints related to the structure of the curriculum. I will discuss both of these areas next.

The general constraints mentioned are those that I feel may be applicable to any of our teaching, particularly with a cohort of around 140 students, for example:

> …time timetabling, cohort sizes (P9 Staff)
>
> …trying to get it across to kind of a huge group of people at the same time (P8 Staff)

Perhaps unsurprisingly limited resources in the form of time, rooms and staff numbers were mentioned here. The underlying assumption is that more resources would make teaching easier, but no suggestions were made about what size or quantity of resources might solve the problems. This position of deficit may have two causes. The first may be a hysteresis in the university, by which I am suggesting a lag in a system based on its history which in this case relates to increases in cohort sizes since the inception of the degree for radiography in 1989 (Price, 2009) at this university, whereas room sizes have not changed significantly over time. A second reason for lecturers making these comments may lie in their own habitus as members of a caring profession who now teach, which is being expressed as a frustration

with the limits of personalised teaching for individual students in such large cohorts, that is, a lack of care giving.

Next are constraints relating specifically to the subject of research teaching and how it fits in the curriculum since:

> …the whole thing is modular and that means you can fire and forget modules as you move to another one (P8 Staff)

> …assessments not taking over a year, [or] across years and levels of study (P5 Staff)

These comments relate to the modular format of university teaching, which is the *doxic* position for universities in the UK. The influence of this position, the agency in its 'intra-activity' with humans (Barad, 2003), means that subjects tend to become compartmentalised and assessments are discrete and related to individual modules. Staff felt that the modular system might be a problem as once a module is finished; students may not apply that knowledge in a future module. Compounding this is the limit put on assessments that must be linked to one module only and cannot straddle levels of education. This was raised as a constraint to improving the way research is taught as it was suggested by a member of staff that without these modular and assessment constraints, it might be possible to run the research project over all three years of the undergraduate programme, with staged assessment. This might help students perceive the importance of research in the curriculum and stop it from being seen as a big project only relevant in the third year. Similarly, the current modular format might make it difficult to embed research throughout the curriculum, as again it might be perceived as disjointed across the programme.

The expression 'fire and forget' as used by P8 Staff above, suggests a reductive or oversimplified way of teaching within a profession, where ideas are introduced, taught, assessed and left as the programme moves on- like an image that is made but never looked at again. Students may qualify as a radiographer without assimilating all the knowledge they have been taught or have learned into their habitus, which could lead to conceptual

difficulties in practice. However, in our teaching links are made between strands of knowledge throughout the programme, but as I discuss in the section below, ‘Embedding research in the curriculum’ (starting on page 170) these links may need to be made more obvious to both staff and students. This is not completely a deficit position, but increased visibility is needed.

It is not only undergraduates we teach, as there are a growing number of postgraduate students studying at PGDip and Master’s level. While some of the postgraduate student participants also spoke about room and cohort sizes, one lecturer mentioned staff numbers with relation to supporting postgraduate students saying:

> …we haven't got the staff [to supervise] because our staff who are interested in research are predominantly [supervising] undergraduate, we haven't got enough time to enable us to support perhaps the postgrad (P7 Staff)

This is another link to lecturers’ habitus and the perceived lack of ‘symbolic research capital’ held by some of them. This is an important issue when there is pressure on clinical staff and HEIs to enable clinical staff to attain and follow the four pillars of advanced practice that I discuss below. Since one of these pillars is research, an HEI needs to be able to support supervision at higher degree level. Without consolidating research as a base in radiography education, and following this as a pillar of advanced practice, in the future radiographers may take positions in HEIs with low levels of research expertise. However, the SCoR continues to encourage improvements in research at all levels, to address this. Within HEIs themselves, more emphasis could be placed on staff attaining doctoral level qualifications, and then, in an effort to address the concerns voiced by P7 Staff above, allow these staff the time to support research students.

4.5.5 Improvements

4.5.5.1 Suggestions for improvements

Stacked images of participants' drawings and comments from CCDs within the sub-theme 'Suggestions for Improvements'

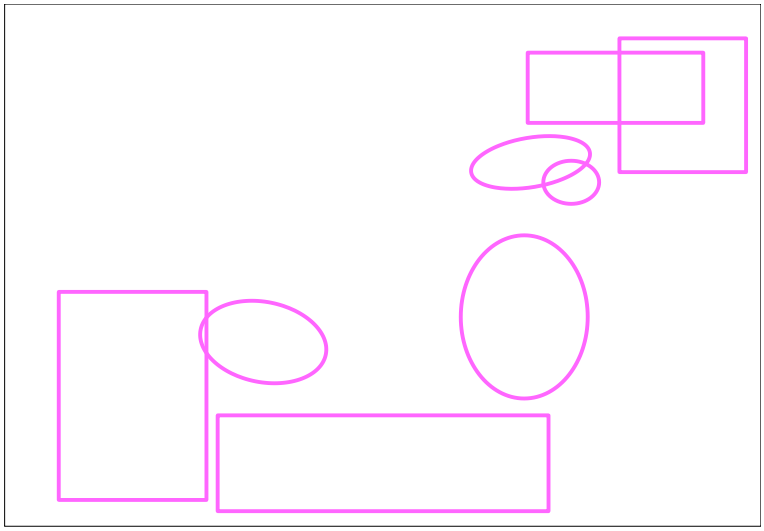

Figure 4:38 Students- Suggestions for improvement

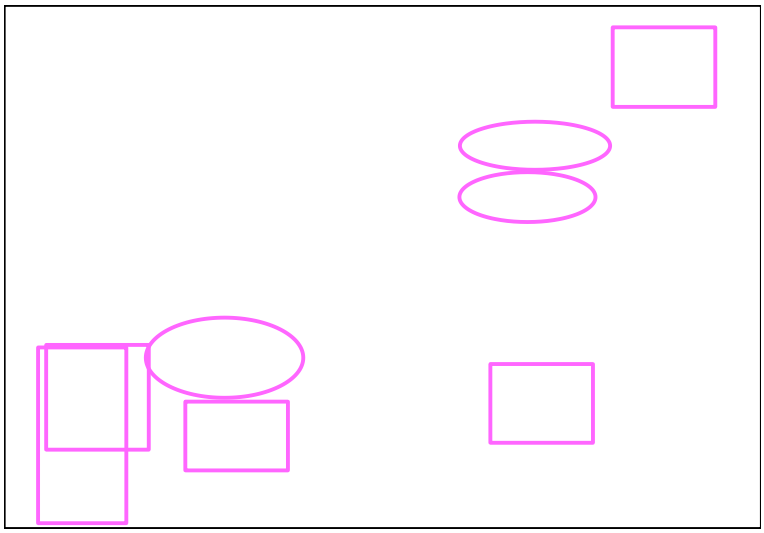

Figure 4:39 PG Students- Suggestions for improvement

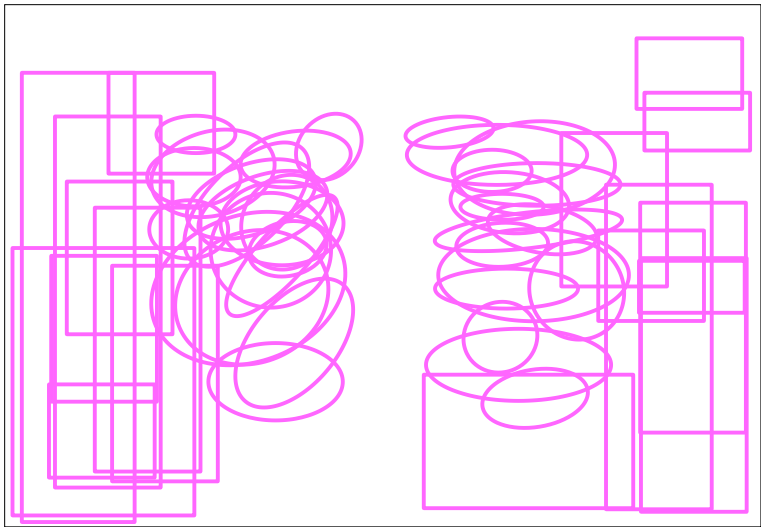

Figure 4:40 Staff- Suggestions for improvement

I asked all participants what improvements they thought could be made to teaching research to radiographers, in response to the constraints mentioned. While acknowledging the larger number of staff participants, the images for this sub-theme give the appearance of staff having more to say in this theme than the other groups. Their answers fall into several sub-themes as follows. General suggestions for improvement are included in the sub-theme 'Suggestions for Improvement'. A second sub-theme is one that several participants spoke about called 'Normalise', meaning to remove the aura of research being something different or difficult, making it instead a normal part of studying for a degree and being a professional practitioner. The third sub-theme is 'Student participation'. Many participants spoke about students doing practical research rather than writing a proposal as part of their research module.

Most of the suggestions for improvement came from staff. This may be because either they are more aware of issues that might be improved than students are, or that their perception of what might be improved echoes the findings above which showed that staff were more aware of constraints than were students. The responses therefore were mainly offering solutions to problems staff had already mentioned such as rooms, timetables and cohort sizes, but some other ideas are discussed further here.

Linking back to comments about 'Student Constraints' in the discussion about habitus, one of the issues raised was that students might see the third-year research project module as a 'hurdle' and a difficult topic. Suggestions to improve this opinion included:

> …don't make research scary introduce it from the beginning (P21 Staff)

> …inspiring them from the beginning is how we can move it on (P5 Staff)

Suggestions of this nature are aimed at introducing research early in the course, in fact 'embedding' research in the curriculum as suggested in the SCoR *Research Strategy* (Society and College of Radiographers, 2015a).

At a deeper level, staff made comments related to our abilities to teach and supervise students, perhaps the most dramatic example being:

> …make everybody get a doctorate and then start again (P7 Staff)

My colleagues who are on a doctoral educational journey made similar comments. They expressed a realisation that their thinking has been challenged by the learning process and all teachers should experience this. They seemed to have a greater understanding of the place of research in the curriculum and importantly, were more confident in teaching and supervising research students. Not only has their habitus changed, but they have also gained academic capital leading to increased confidence. This was noticeably different to some non-doctoral staff who felt there was not enough expertise or confidence in the team. One participant suggested that perhaps there might be a mid-point between an MSc, which many of my colleagues hold, and doctoral level study, for example allowing staff to participate in the guided learning portion of a professional doctorate. Certainly, for me this part of the doctoral training was a challenging intellectual adventure, which I am also happy to recommend to others perhaps in the form of an MPhil (Master of Philosophy), or MRes (Master of Research) degree, or even the Postgraduate Certificate in Research Methods that is part of the professional doctorate taught programme in this university.

One participant discussed the difference between red-brick universities and post-1992 universities, of which ours is one, and the relationship between teaching and research. While we pride ourselves on teaching a vocational degree course, they expressed concern that our staff are not actively engaged enough in research. Even staff who are research active and those who present externally need to share their research with students, as one participant said:

> …we need to be more proactive in sharing with students the research that is going on in our department (P4 Staff)

We need to also:

> …make it [research] exciting don't you, you need to sell it as something that will change practice (P9 Staff)

This comment is about not only enthusing and inspiring students to engage in research as a course subject but goes to the heart of why we need to do research: changing practice for the benefit of patients. In other words, students' habitus changes to enable them to gain 'symbolic research capital' that has a direct effect on activities within the professional field. Unfortunately, there is also a connotation of commerce here, where we sell something to the student as a consumer of education, a concept widely written about but mentioned in an editorial piece by Nightingale (2016) in relation to radiography education. I feel though that this comment was more about convincing students of the worth or merits (Oxford English Dictionary, 2016) of research, with a clear and positive outcome of benefit.

4.5.5.2 Normalise research

Stacked images of participants' drawings and comments from CCDs within the sub-theme 'Normalise research'

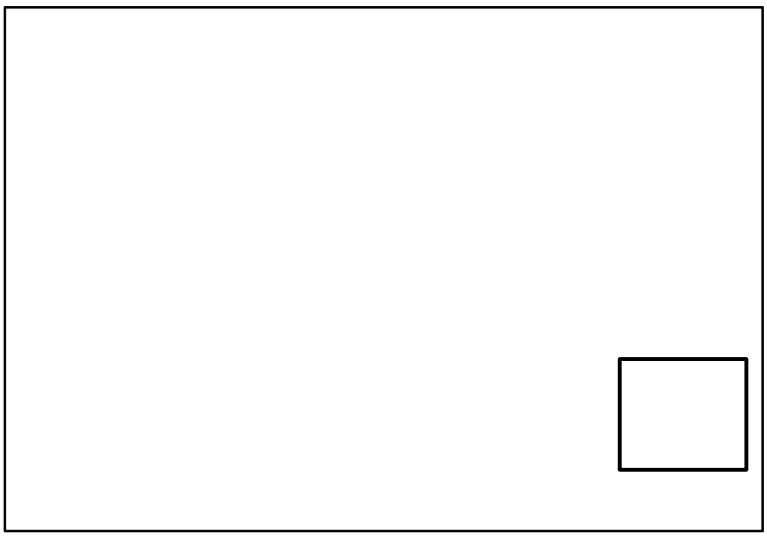

Figure 4:41 Students- Normalise research

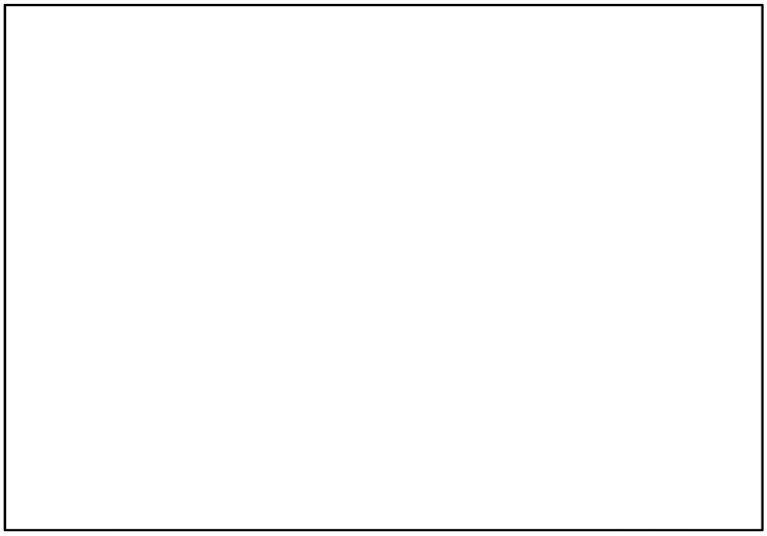

Figure 4:42 PG Students- Normalise research

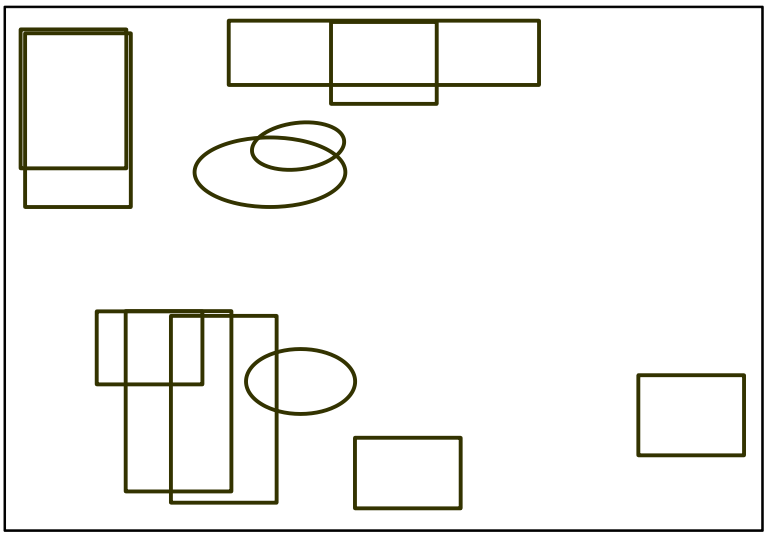

Figure 4:43 Staff- Normalise research

Sometimes an absence in a medical image is as important as a presence, and as shown opposite, postgraduate students did not mention ‘normalising’ research in any form. It may be that they already normalise research; it is what they do as part of their work and study. Several comments were made here though, with P7 Staff using the word ‘normalise’ from which this theme developed, for example:

> …it's [research] been turned into an extra ordinary thing and it shouldn't be - normalising that's a good word (P7 Staff)

> …it [research] needs to become natural doesn't it, so we need to have that, that it's just normal, it's just what you do (P5 Staff)

The suggestions were that research should become a normal part of what radiographers do, not a special add-on for the few. Research should become a part of a radiographer’s habitus and practice, just as using highly technical equipment and patient care has become normal. This has happened with technology and patients, as mentioned previously, to such an extent that reductionist language is used in practice. For example, an examination may be done in an area referred to as ‘Room 2’ rather than a more descriptive term which references the type of equipment available; an example of ‘black boxing’ the technology when it is not mentioned by name. Similarly, Reeves (2012) notes that referring to patients by body part rather than by name is ‘endemic within the profession’ (Reeves and Decker, 2012: 87); the reductionist language being a product of the biomedical model and how students are taught although it is not an inevitable position. In these cases, the language of familiarity is embodied in radiographers’ habitus.

However, research is not a part of the everyday practice of radiographers in the same way as the technology and patients are and the language used around research by staff reinforce the idea that research is ‘scary’ or ‘horrible’ rather than part of the *doxa*, for example:

> …it needs to be introduced straight away so it's not a scary topic (P21 Staff)

> …it can be made to be a big research big scary horrible research and it shouldn't be (P4 Staff)

Nevertheless, solutions were offered to help integrate research into students' habitus:

> [it's about] us managing to achieve this, being more research active so then students would see it as part of the role of a radiographer (P20 Staff)

> if it's integrated and it's part of it right from the word go it's not that kind of big scary deal… make them realise actually doing research is a common thing that's part of the job (P4 Staff)

These ideas link back to my comments about 'symbolic research capital' of lecturers and the need for us to have research activities of various types embodied within our own practices so we can share this with students. In the same way as anatomy and radiographic technique are what students expect to learn and use in practice, we need to help them realise their potential to build their own 'symbolic research capital' to enhance that of the profession. One student understood this, expressing how research had become normalised in their mind, saying:

> …by the third year you almost stop noticing that it's actually research, you start actually just doing it, start more naturally doing it (P2 Student)

When they say 'you almost stop noticing it' perhaps for them research is just what you do, without stopping to give it a name, and so it becomes part of the *doxa* of radiography.

As mentioned in the literature review chapter, the SoR developed a career framework for radiographers which set out four levels of practice: assistant, practitioner, advanced practitioner and consultant (Society of Radiographers, 2013). Many radiographers progress into advanced practice during their careers, for example in ultrasound or reporting roles. Health Education England (HEE) have since developed a multi-professional framework for advanced clinical practice, which includes practitioners at advanced and consultant levels (Health Education England, 2017). This framework has four pillars, clinical practice, leadership and management, education, and research, all four of which practitioners are expected to incorporate within their practice. In addition, practitioners are expected to hold at least a master's level qualification. While not all radiographers will attain this level of practice, many do, and clearly, if there is an expectation to have a master's degree and to

embrace research as one of the four pillars, a base knowledge of research is needed on which they can build. As radiographers do not necessarily choose their future career path before qualifying, we need to ensure they have the skills to allow them to progress in any way they wish, which includes a need to be able to use and conduct research. As one member of staff put it:

> …we don't train people just to stay in clinical radiography forever (P4 Staff)

Therefore, research must become a normal part of education and professional practice, in other words embedded within education and practice, to enable individuals to progress within the profession. My research aimed to find how we currently embed research in our curriculum and my recommendations for improvements based on findings follow in Chapter 5 Conclusion and Recommendations.

4.5.5.3 Student participation in research

Stacked images of participants' drawings and comments from CCDs within the sub-theme 'Student Participation in Research'

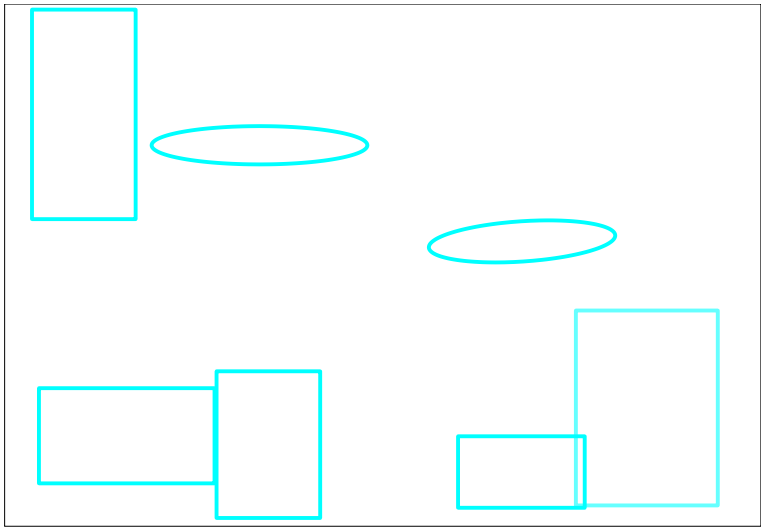

Figure 4:44 Students- Student participation

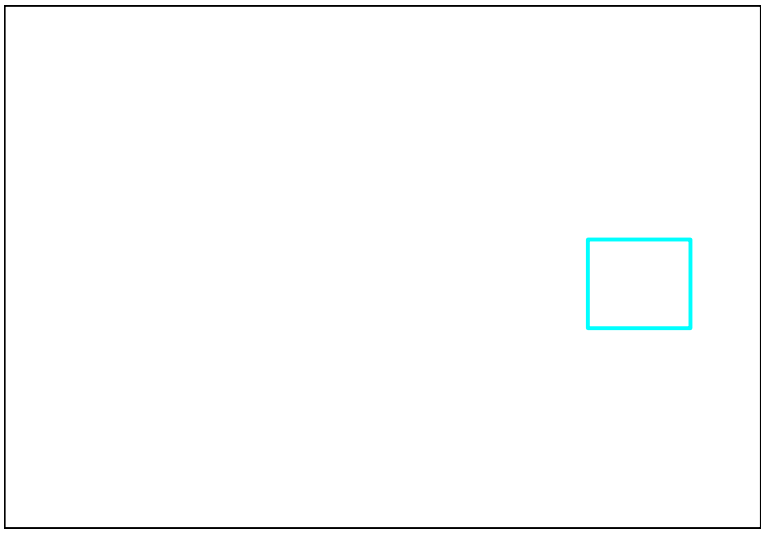

Figure 4:45 PG Students- Student participation

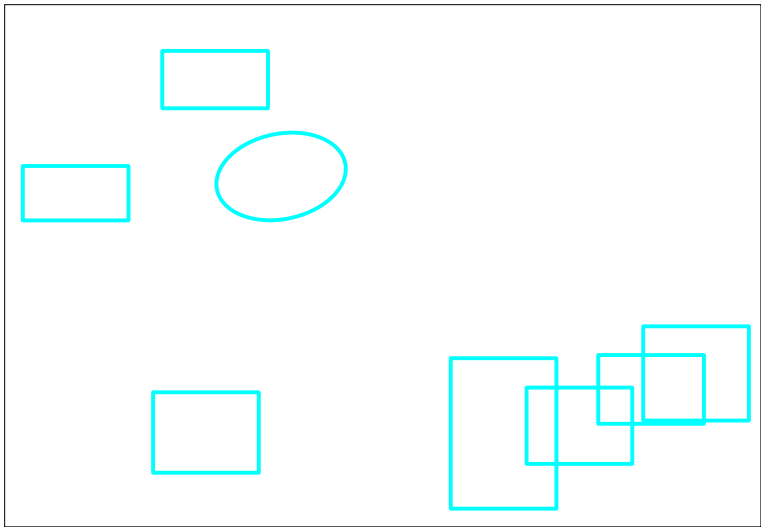

Figure 4:46 Staff- Student participation

Although, as shown in the figures opposite, there is little evidence of this next sub-theme from the drawings alone as represented by oval shapes, many participants mentioned it and so ‘student participation’ figured more on the Co-Constructed Depictions, represented opposite by rectangular shapes. This pattern may be because in several cases these comments came in general conversation towards the end of the interviews, when participants felt they had finished drawing. I feel it might have been better to ask about ideas for improvements with a separate drawing sheet for each participant but had not anticipated so much discussion about ‘student participation’ in research. On reflection, this had become a topic of conversation generally in the department as I had been putting some of these ideas into practice in the time between designing the interview questions, and when the interviews took place. Overall, using Co-Constructed Depiction to analyse the results has ensured that these ideas have not been missed from the analysis, which might have happened if I had only relied on the drawings for my data analysis.

The concept behind this theme is that students might benefit from doing a small research project, rather than just a research proposal as a form of assessment, as is current practice, the suggestions being:

> …practical research- they need to do it (P3 Staff)

> …personally, I think it would be more beneficial to actually do the research itself …I find it very strange that we don't do it (P11 Student)

Considering radiography is a vocational degree course, with students spending approximately half their time in the clinical practicum learning ‘on the job’, these comments highlight an anomaly in the way we teach research. It has become a desktop exercise of writing a proposal, rather than a practical skill for our students who are used to applying knowledge in practice. This reflects Baird’s (1996) suggestion that there is a dichotomy between the practicum and academia, but this problem goes further than her suggestion that students find it difficult to match clinical practice with knowledge learned in the university as students may find it hard to practise research having not had chance to gain practical

knowledge at all. Although students need to be encouraged to think critically about what they are doing, as Baird suggests, there is little opportunity for students to practise research skills in the current curriculum. One postgraduate student had a short elective period when they were able to:

> … [do] something that we wanted to do related to research so I followed a research physio for the day (P16 Postgraduate Student)

This participant showed enthusiasm about this opportunity to see research practice in action. Fortunately, our teaching is changing to offer students the opportunity to practise research, to add this skill to their habitus. There is still a problem though that if research is not performed widely in clinical practice, students will not see it happening as a normal part of radiographic practice, linking back to the discussion about the need for 'normalising' research for radiographers.

With reference to doing a research project during the undergraduate course, some participants recognised that there might be difficulties such as limited time to gain ethical approval and conduct research with the time constraints of an undergraduate course. I have mentioned restrictions on taking assessment over more than one year, but some participants suggested that if students started work on their proposal in the second year, which could be assessed at that point, they would have more time in the third year to work on the practical aspects of doing research. This suggestion would require input to curriculum design and teaching, which is only periodically possible, but which I will support at the next opportunity. Currently our students write a research proposal, and then make up data to demonstrate their understanding of applied analysis. One student suggested that it might be easier to work with empirical data they had collected, as making up data was difficult. If students are going to carry out research, they will need to be working on the project throughout the year, not leaving it to close to the hand-in date before starting. In my experience, this is where some students have difficulties, trying to fit their thought processes and writing into a short time.

Overall, there was support for empirical research by students, tempered with concern for fitting this into the academic timetable, but this is already changing as we prepare to offer students the opportunity to carry out small scale, low risk research at undergraduate level.

4.5.6 Embedding research in the curriculum

Stacked images of participants' drawings and comments from CCDs within the theme 'Embedding Research in the Curriculum'

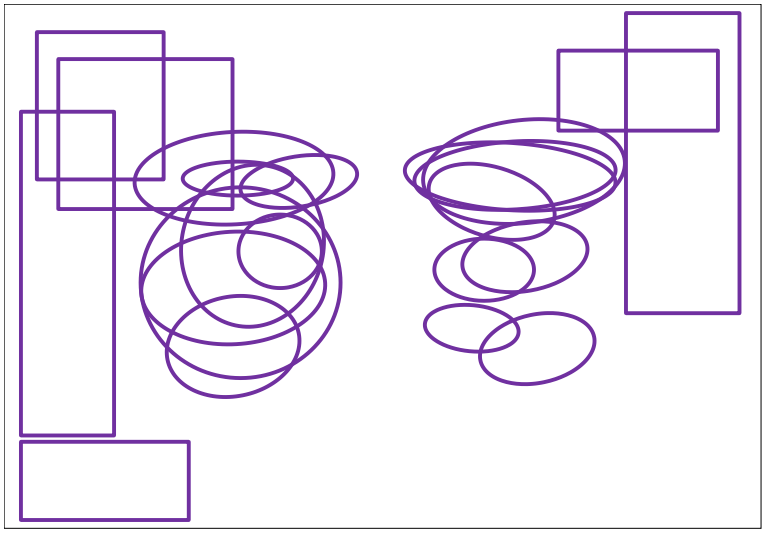

Figure 4:47 Students- Research in the curriculum

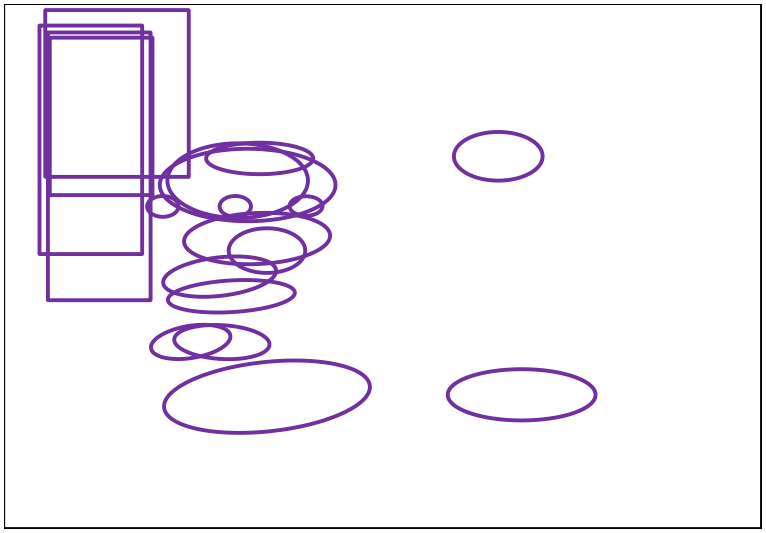

Figure 4:48 PG Students- Research in the curriculum

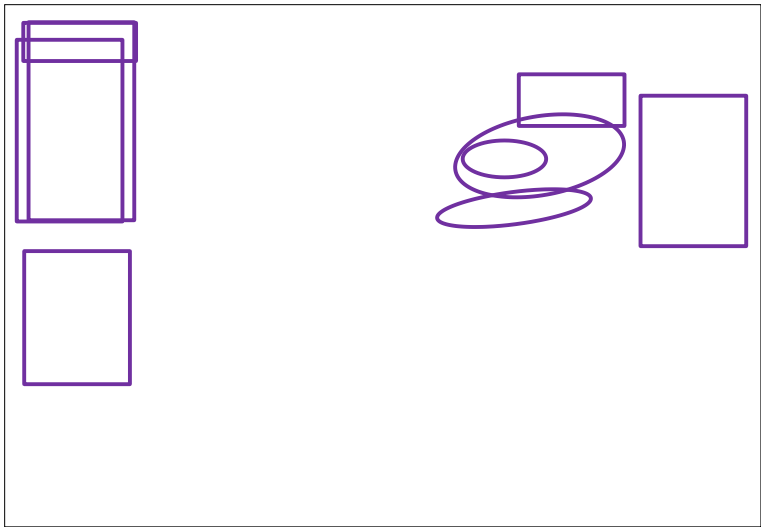

Figure 4:49 Staff- Research in the curriculum

If the images for this theme, shown here, were medical images shown together, I would have a physical reaction, a drawing in of breath at a *puncta* here. For me this surprise that was unexpected and yet shown here visibly is the difference in the answers between staff and students to this question. Of course, I was expecting this from the data I was collecting and what was said, but it was still surprising when I *saw* the data, as they were not what I had expected when I started out.

This theme is about whether, and how, participants perceived that research is already embedded in the curriculum. I discuss this theme in two parts, 'Students' perspectives' and 'Lecturers' perspectives' to allow me to explicate any differences between teachers' and learners' perceptions, in partial answer to my third research question. First, I will give the results for the question, and then discuss the differences between the responses from staff and students, and how these responses differed from my preconceived ideas. I restate the question here for clarity:

> Drawing 3 Question (How) do you think we embed research in the whole curriculum?

This question is asking participants to think about the curriculum and tell me what were for them a form of Barthes' *puncta*, in other words, what stood out, or struck them as being about research when they looked back. The students answered this question with comments such as:

> I think, no it [research] is kind of like introduced to us slowly, slowly in the first year and then in the second year there is a bit more then in the third year it's pretty full on (P1 Student)

> Not so much in the first year but second year. First year it's more planting the seed. Third year research proposal taking what we learned from previous years and putting it into practice (P2 Student)

All the undergraduate students gave positive comments that they did think research was embedded in the curriculum, although following further questioning this was something they thought they could see in retrospect but might not have realised at the time. These two

students identified research being added incrementally through the course. One student suggested that we should make it more obvious during the course, so they did see research throughout, and that way the research project in the third year would not come as such a surprise. Another student was able to recall specific incidences where the work they were doing had been flagged as research by the lecturer, but others did not recall my own comments about research activities during lectures in the first year that I had said linked to their assignment in the third year.

Two students, who from other answers seemed to feel research was important for radiographers, made the following comments:

> I saw research more as I went on with my studies by undertaking the research in your module…it's really come to light that it's always been present in the whole curriculum and I appreciate it more understanding more the actual effort that goes into research (P11 Student)

> everything being based on research everything that is taught us throughout the whole degree, you look back and realise that everything has been sort of preparing you for something like that (P12 Student)

Again, these students seem to be able to see where research was embedded in the curriculum in retrospect, but unlike those above who saw research building through the curriculum, they could see research had been embedded through all their teaching and learning, not just in modules which students thought were specifically preparing them for their third-year research module. These students are reporting what I feel embedding research should be, according to the definition I used above from the OED (2016): ‘implant (an idea or feeling) so that it becomes ingrained within a particular context’. The idea, of research, has been ingrained or embodied within the entire curriculum, according to these students. Our problem is that not all students see this, which is where our work lies.

Postgraduate students saw a divide between the practice specific lectures, for example when learning about image reporting, and research specific lectures leading to the PGDip or MSc qualifications. Although clinical skills and research seemed separate to each other in

the curriculum, they did think that there is a research base to what and how we teach, which was signposted to them by further reading or reference lists. So again, looking back, the postgraduate students could see research embedded in their curriculum, but more obviously in the research labelled modules than clinical skills modules. In other words, where they were told to find it.

When I asked staff this question about whether they thought research was embedded in the whole curriculum, there was a more cautious response:

> I don't think we do…if it's there it's there implicitly (P20 Staff)
>
> …we do it carefully I think we do it in pockets (P4 Staff)

Generally, staff did not think that research is embedded in the curriculum and some found this a difficult question to answer, as it was not something they had considered before in connection with how they teach. This suggests that some lecturers may not have within their habitus a propensity to use research and evidence in their teaching or curriculum design even while we are attempting to embed research in the curriculum and in student habitus. However, staff did articulate the constraints on how we teach research, and these link to the perceived difficulties with embedding research in the curriculum, but there were also many suggestions proffered for improvement, both of which I have discussed. In addition, we can celebrate the positive replies from students. Recognising deficits in our teaching and sharing good practice through this investigation may help to increase momentum in attempts to overturn in the hysteresis within the systems of the university and in individuals' habitus.

I found it interesting that while staff thought we did not clearly embed research in the curriculum, students thought that we did to varying degrees. I had expected to find the opposite with staff giving examples of where they thought embedding research happened, while students might not have recognised these instances. With a keen interest in research myself, I might have overestimated how much my colleagues might be highlighting research topics within their teaching and some of them may not have recognised where they are using

research in their teaching. Mainly I think this concept provoked reflection by them about their practices, as evinced by the volume of ‘constraints’ and ‘suggestions for improvement’ comments made.

There may however be another explanation for this blindness by staff towards research in the curriculum. I have suggested that my participants mentioned patients, technology and equipment very little in their answers because they are part of ‘what we do’ as radiographers; of course we deal with patients and technology, it goes without saying. It may be that the same is happening with research. People do not recognise the spectrum of research in which they are involved, because it is another part of the taken for granted of our work that we do not see, like the students who most clearly saw research in the curriculum when it was flagged or labelled as such.

4.6 Conclusion

I developed Co-Constructed Depiction as a method for collecting and analysing data which builds on my professional background as a radiographer as a producer of images. I used a theoretical approach to thematic analysis (Braun and Clarke, 2013) to look for evidence of the themes around Bourdieu’s concepts of habitus, field and professional field (1992) with relation to radiography, research and its pedagogy.

The data I collected and analysed has given the appearance of an awareness within staff and students of the importance of a spectrum of research activity for the profession, in the form of what I have termed ‘symbolic research capital’. The importance of a radiographer habitus for staff was identified, particularly by students who value staff that might be seen as ‘one of us’ professionally. While many constraints to our teaching were mentioned, there were also many suggestions for improvement, some of which, such as encouraging students to perform research rather than just produce a research proposal, are already having an impact on teaching. Staff and students saw the embedding of research in the curriculum in different ways, with staff feeling there was little research in the curriculum, but students able

to identify much of what is there. This was not what I expected to find and reassures me that students are picking up some of our signalling to important aspects of the curriculum, but we could do better, perhaps staring by signalling to ourselves what we are doing that builds our individual ‘symbolic research capital’.

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Chapter 5 Conclusion and Recommendations

In this chapter, I discuss the results of my research with reference to the research questions I posed at the beginning. I then summarise the ways I have approached this research with a new method and application of theoretical frameworks. I give my recommendations for future policy and practice along with those for further research that would build on my work. I reflect on what I perceive to be limitations within this study, and on how it has changed my practice as a radiography educator.

5.1 Research Questions

The purpose of this research was to find out about research pedagogy in Midlands University by asking staff and students questions about the influences they perceived on why and how we teach research to radiographers, and whether, in answer to the expectations of the SCoR *Research Strategy* (Society and College of Radiographers, 2015a), research is embedded in the curriculum. Using Barad's (2007) expression I positioned myself as 'entangled' within this interpretive qualitative research. I drew on Bourdieu's work, particularly his idea of replacement of the concept of 'profession' with that of 'field' to position radiography as a profession, whose borders can be maintained using, amongst other forms of capital, 'symbolic research capital', a term I created to signify the importance of research to radiography.

Searching for a research method in harmony with my position within the interpretivist paradigm, while acknowledging my entanglement within the research as a co-constructor with my participants and also mindful of the voices of individuals, I developed Co-Constructed Depiction as an innovative use of imagery in both data collection, analysis and presentation of results. This innovative method is symbolic of and congruent with the practices of the radiography profession as it maintains the importance of images, their interpretation, and use in my research. This new approach to data collection and analysis, Co-Constructed Depiction, melds my professional background as an image-maker and interpreter with my newer identity as a researcher of professional practice in education.

Barthes (1982) provided me with a way to link photography, medical imaging and analysis in my new method by utilising his phenomena of *stadium* and *punctum*. I will now address each of the research questions in turn and summarise what I found in relation to each one.

5.1.1 Why is a research base important for the radiography profession?

The answers to this question, based on both the literature review and data collected from participants showed an understanding of the importance of research for a profession. In the literature review, I argued for the position of radiography as a profession, particularly based on the body of knowledge generated by research within the professional field of radiography. When I asked participants about *why* we teach research to radiographers there were many answers giving positive reasons, which resonated with the concepts of professional field (Bourdieu and Wacquant, 1992) and 'symbolic research capital' as a form of symbolic capital. Participants described concepts which I analysed within a theme 'habitus', exposing their understanding that personal habitus, specifically as a radiographer, was important in becoming a radiographer and, through symbolic capital, important for teaching others. There was no doubt, from the participants' answers that radiography is a profession and we need to do research to build and maintain our credibility as a profession.

Most participants mentioned the importance of patients in the radiographers' role, as they talked about the link between research and its benefits for the service users. Interestingly, very few mentioned the technology with which we work each day. Perhaps through a professional research lens the patient is clearly in our focus, but research into and advances in technology are not within our domain as they are more likely to be within the research remit of technology, engineering, and physics, and so less important for radiographers as a research subject. However, there is a paradox here between the concept that a radiographer cannot function as such without the technology needed for medical imaging and the lack of discussion by my participants around research and the technology we use daily. I propose two possible explanations for this. The first is that perhaps the machines and technology have become, in Bourdieu's term, part of the *doxa*, meaning such an integral part of a

radiographer's work that it is taken for granted. I used this theory in the data analysis to explain why the patient was not mentioned by participants as much as the profession where I similarly conjectured that the patient is a taken for granted part of being a radiographer. Perhaps because the focus of this thesis is research and its pedagogy, there was no similar suggestion that research is 'taken for granted'. The second explanation rests on Freund's (2004) concept of 'technological habitus'. He suggests that humans and machines can join in a relationship, which I suggest is what happens when humans become radiographers in practice, using the machine as an extension of themselves to the point where it becomes part of their habitus in that moment. Radiographers might not mention the equipment because it is part of themselves and their actions. For example, we talk about 'doing' imaging on a patient, rather than 'using a particular machine to do' imaging or 'doing a CT scan' not 'using a CT imaging machine to scan…' The extension of this is the expression 'doing an x-ray' when in fact the x-ray beam used to make the image is the product of a machine which itself generally remains nameless. This also links to what Murphy (2006) and Bolderston (2010), who are both radiographers, say about radiographers being the link between technology and the patient, for whom, unlike radiographers, the technological environment of an imaging room may be unsettling. By contrast Burri and Durmit (2008) and Burri (2008), who are not radiographers, focussed on the technology from their perspective as outsiders. They were aware of the technology and its place in imaging as might patients who are outsiders but made no links between the technology and patients. The radiographers, Murphy (2006) and Bolderston (2010), by contrast did make connections between technology and patients, putting patient care at the focus of their research.

5.1.2 What are the perceived influences on radiography educators in their endeavours to teach research in the radiography curriculum, from both educators' and students' perspectives?

To elicit answers to this question, I asked participants what they felt are the influences on *how* we teach research to radiographers. These included both internal and external

influences and constraints felt in teaching and learning in terms of habitus of individuals and nonhuman constraints such as room sizes, which affected teaching in their 'intra-activity' with people.

The feeling from these answers is generally one of negativity, for example, many participants cited large class sizes and timetables as constraints to teaching. These are nonhuman influences which are having an effect on teaching at the point of 'intra-activity' with us; in Barad's (2003) terms they have agency in their 'intra-activity' with us along with policies and professional body dictates. The concept of 'student constraints', as related to student habitus influences how we teach, based on students' knowledge and skills and how they see research fitting into their chosen professional field. While we may not be in a position to change the skills and knowledge of students entering the course, as educators we could do more to help incoming students by offering additional skills classes such as academic writing abilities. One problem then is that if students do not know they need extra help, they might not attend these classes so our task then becomes one of raising self-awareness in students, revealing their habitus to themselves. Similarly, we need to acknowledge the skills and abilities the students have and develop over the course of their education and avoid a form of symbolic violence (Bourdieu and Wacquant, 1992) whereby students are assumed to have low skill levels and are not encouraged or inspired to do well. For example, some staff felt that our students arrived with poor academic abilities so need to be taught in a particular way, which might restrict the students' chance to grow both academically and personally.

With reference to the habitus of lecturers as a constraint, I have suggested above that extra research training could be undertaken by staff, aligned with increased individual support for supervisors new to the role. In turn, this might help staff towards completing doctoral level qualifications in a staged manner, rather than having to complete a course within a set time limit with the commensurate up-front time commitment that may be a factor in dissuading some staff from starting doctoral level work. I have successfully helped new staff to develop

their supervisory role and appreciate the time commitment on both sides to make a success of this too.

Although many constraints on teaching research were mentioned, there were also suggestions for improvements. At a time of staff shortages in health care, and an increasing population and therefore demand on services, it is likely that newly qualified radiographers will continue to need to 'hit the ground running'. However, if their education has given them a base of skills and knowledge, I suggest that they will be able to 'hit the ground thinking'. When they are ready to build on this, they will be able to take on advanced practice roles as their careers progress. We should adopt a four bases curriculum structure, based on clinical practice, leadership and management, education, and research, so the importance of research to a radiography professional can be raised, perhaps in part eliminating the students' perception of research as a burden to be borne in the third year. Similarly, it is already expected that clinical skills are normal for radiographers, so efforts to 'normalise' research during education and then in the workplace, through the joint efforts of HEIs and the SCoR are important if 'symbolic research capital' is to be increased within the profession. In other words, research will become 'something we do': a normal part of being a radiographer.

Of equal importance is the impact on patient care when radiographers use research in practice. While this was commented on by participants, I do not feel that students appreciated how much they would use research in the form of Evidence Based Practice as opposed to doing research, although this may have been because of the way I asked questions which were seen to be about the theory rather than the practice and application of research. Alternatively, as students have not yet had the opportunity to work as a qualified radiographer, they may not have understood how this might happen in practice where a spectrum of research activity is used, in other words reading and using research is just as important as producing it and this will be emphasised in future teaching.

One of the sub-themes concerned student participation in research. As a result of these findings, I have changed the assessment methods for the research module, to include the opportunity for students to choose to complete a short, low ethical risk piece of research as part of their assessment. In future, I will involve students in satellite research within the overall research aims of the department, to increase the impact of their work. As our department becomes more research active, a process of 'normalisation' of research for staff as well as students will lead to research being a bigger part of what we do as radiographers, becoming embodied in our habitus.

5.1.3 How is embedding of research in the radiography curriculum at Midland University perceived, from both educators' and students' perspectives?

In some ways, the answers to this question gave me the most interesting results, as they were not as I had expected. In short, it seemed that students did think we embedded research in the curriculum, while staff did not think we did it well, or at all. As I have said above, I expected the opposite, with staff saying they thought research was everywhere in the curriculum but students missing the obvious signs.

This gives us an opportunity to build research into the curriculum in a way that is more explicit for staff and students. Several staff participants felt this question was difficult to answer, as it was something they had not thought about before particularly in relation to their teaching. Therefore, we need to identify what links there are to research, in our modules and teaching and make clear to staff that they need to emphasise these links to students, so they are left in no doubt about research being threaded through or embedded in everything they learn.

This paradox also links to the notion of symbolic violence (Bourdieu and Wacquant, 1992) where the lecturers are describing the aptitude of students in a negative way, and so they mention changing the way they teach to match staff expectations of student achievement. Staff seemed to misjudge and hence underestimate the ability of the students to see where

research is currently embedded in the curriculum, again making negative judgements about student abilities.

To conclude, although there are research elements within the curriculum, more must be done to overtly 'embed' research in the curriculum. We also need to make it more obvious to staff and students where research already sits in the curriculum and their activities, to meet the suggestions put forward in the *SCoR Research Strategy 2016-2021* (Society and College of Radiographers, 2015a), the inspiration for this research.

5.2 Contribution to knowledge

I wanted to research my questions using a methodological approach that was consistent with my professional identity as a radiographer educator, for whom the skills of making, using and reading images is central. Therefore, I developed a new method of data collection and analysis, Co-Constructed Depiction, which uses imagery and reporting in a reflection of my professional practice. My data analysis drew on Barthes' (1981) idea of *punctum* to look for what struck me in the data when looked at as a whole. This new method avoided coding, which does not fit ontologically with the concept of medical images being looked at as a whole rather than in parts. I used this new method to investigate the positionality of research in radiography and its pedagogy in Midlands University that has not previously been investigated, as a form of practitioner research. I was prompted to do this study to address the SCoR aims that research should be embedded in the curriculum by HEIs and I wanted to find out what our current position is, and how we might improve it and so recommend changes both internally and externally.

By using a Bourdieusian lens to investigate the theory of replacement of the concept of 'profession' with that of 'field', I have made an argument which goes further than some other radiography writers (Adrian-Harris, 2006; Hogg, 2011; Whiting, 2009a), as I showed that radiography *is* a profession, a position which is validated by my participants' comments. The concepts of habitus and notion of replacement of the concept of 'profession' with that of

'field' have been used to examine thematically the data I collected. While these concepts have been used by others to understand different aspects of radiography and profession, such as Wordsworth (2013), there is no previous literature linking these concepts to research pedagogy and radiography. I made a conscious decision to include many radiographers' published research to show the 'symbolic research capital' the profession already holds.

5.3 Recommendations for policy and practice

I suggest that one of the tasks of radiographer educators is to help the student develop their own version of the professional radiographer's habitus, through exposure to the academic and practical aspects of radiography. This embodiment of *radiographer* needs to include research abilities and skills to afford members of the profession the ability to develop symbolic capital. In practical terms, the links between research and professionalism can be made more evident to students from the start of their studies. This would increase their understanding of their relationship to 'symbolic research capital', and how it links to maintaining the profession. We need to be clear that radiography is not a 'button pusher' job, not a mere *doing* job, but a profession in which radiographers can progress to advanced clinical practice, by *thinking*. For this, radiographer need to be ready to enact the four pillars of advanced practice, clinical practice, leadership and management, education, and research, of which research has been shown by some to be the most difficult practically (Harris and Paterson, 2016; Whiting, 2009c). Greater awareness of the importance of these four pillars in advanced practice could, I suggest, be achieved by using the subject themes to underpin the undergraduate curriculum, in the form of four bases, to structure the subjects currently taught at undergraduate level so the links to advanced practice are apparent from the start of their education. This recommendation is applicable to all non-medical healthcare professions as they are all included in the Health Education England (2017) framework for advanced clinical practice, the pillars of which I believe need to be embedded within the undergraduate curriculum as four bases. There is national and international application for

this work in radiography and other healthcare professions as ‘symbolic research capital’ is important for professional development, and particularly for improvements in patient care wherever patients are being cared for worldwide.

As a department we need to make our links to research in the curriculum more overt, and show our credentials as researchers, part of our ‘Habitus of Lecturers’ to our own students as well as promoting our department externally, by sharing what we are doing, displaying our ‘symbolic research capital’ to others. In the future, students will perform research with lecturers as part of their final year research project, allowing students to be involved practically, and increasing lecturers’ research and supervision expertise and confidence. Overall, research needs to be perceived as a normal part of teaching and learning, I suggest it needs to be ‘normalised’ both in the university and in clinical practice and I will continue to act as a role model for staff and students.

5.4 Recommendations for further research

Having developed Co-Constructed Depiction, I will use this data collection and analysis method in future research. In particular I will investigate some of the questions that I feel have been raised by this research as needing future study as follows.

I only asked third year undergraduate students, who were close to qualifying, to participate in this research as I wanted them to reflect over their three-year education period when answering the question about where they had seen research embedded in the curriculum. After enacting some of the improvements I have suggested, I will include first and second year students when I ask the same question, to see if the changes we are making are being recognised by students earlier in their education rather than just in retrospect, to assess whether the changes are having any impact. A longitudinal study will follow students through qualification and into their working life as radiographers to gauge the long-term effects of curricular changes on their habitus with respect to research activity.

I would like to have a clearer picture of what staff feel are the constraints on themselves, that is on their own habitus, rather than constraints linked to resources such as classrooms. While I do not mean to make light of limited resources, I feel that enabling staff to be more skilled and confident themselves will empower them to overcome some of these other issues. Having a better understanding of these habitus constraints will enable focussed education and guidance to address them. However, I have suggested above that perhaps staff are not seeing their own place within the spectrum of research and may underestimate their own knowledge and abilities in an echo of imposter syndrome (Clance and Imes, 1978). These focussed questions will help us identify the needs of incoming staff in the future, before they are thrust into supervision, possibly before they are ready or confident.

I have mentioned the four pillars of advanced clinical practice: clinical practice, leadership and management, education, and research. I have also suggested that at undergraduate level these should be given a foundation, in the form of four bases. In this study, I have investigated the embedding of research in the curriculum so I suggest that further enquiry might be made into the other three pillars, to see the extent to which they are already embedded, and so illuminate their importance, as this research has raised awareness of the research element of the four pillars.

5.5 Limitations

This study was situated within one HEI and based around my own perceptions of what I wanted to investigate, and while the findings cannot therefore be generalised, that was not my intention as I aimed to research into practice in a local setting. However, I do believe that suggestions I have made will be useful in professional education for radiographers and other allied health professions. I have acknowledged my entangled position within the study, but my participants self-selected and therefore might not be representative of the whole population. In addition, although I asked participants to view me in a neutral role, using the words ‘for this research I am a student, not a lecturer or module leader’ it would be naïve to suppose that my position as a lecturer, module leader and doctoral student did not have

some effect on my participants and their responses. However, as I am clear that my method is Co-Constructed Depiction, my position within the research is made overt and that of my participants is embodied within the research.

I made the decision not to explain what I understood by the term 'research', to allow participants to give their responses without being influenced by my thoughts at the time of the interviews. I wanted to gain an understanding of what their thoughts were at the time, and I acknowledge that their interpretation of my questions and terms used had an impact on their responses to the questions asked. Had I given a definition of research which encompasses the spectrum of research activity, or used more probing questions, participants may have given different responses. In particular the question about research being embedded in the curriculum, if explained as a spectrum of activity, may have led to a greater number of more varied responses. However, from the replies to all questions it was clear that some participants were aware of the spectrum of research activity, mentioning research as knowledge building as well as using research to deliver evidence based practice.

5.6 Reflections on developing the new method, Co-Constructed Depiction

My new method, Co-Constructed Depiction, can be used to enquire into other fields of interest where qualitative methodology is appropriate. I am planning a qualitative project to understand the experiences of students on a new course at my university and while I will use the same method for collecting and analysing the data, I feel that for this new group, a skeleton will not be appropriate. However, to break up the drawing page and so avoid participants being faced with a blank page, which may be daunting, I will use a different, profession specific 'starter' image. My original idea of asking participants to 'rank' their ideas in order of importance did not work, as they wrote and drew telling a narrative of their experiences (Riessman 2007), rather than stopping to think and order ideas. I realised that this might have a positivist quantitative overtone from which I have consciously turned so made no effort to impose this on my participants and would not do so in future.

My analysis was based on both the Co-Constructed Depictions and the stacked images, to tell the story of what all the participants had said to me. My method could be used to tell individual stories if that was more appropriate to address the research questions posed, by telling individual stories illustrated by the Co-Constructed Depiction images alone. This versatility allows future users of this methodology to conduct their enquiries using Co-Constructed Depiction as a guide, rather than in a prescriptive manner which might stifle the creativity which was a fundamental element in my development of it.

5.7 Reflections on my practice

Engaging in this practitioner research has confirmed my belief that radiography is a profession and that radiographers are aware of the importance of research for our profession. Educators in Midlands University already try to embed research in the curriculum, but we can do more. My practice has already changed as a result of my findings, and I am aware of further work to be done in improving the curriculum. I am mindful of an issue of lack of confidence for some of my colleagues which I will help address. My own confidence has increased as I have overcome practical issues related to the research process and the development of a new method which can be used by myself and others in future qualitative research studies.

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Appendices

Appendix A. **Pilot Study Drawings**

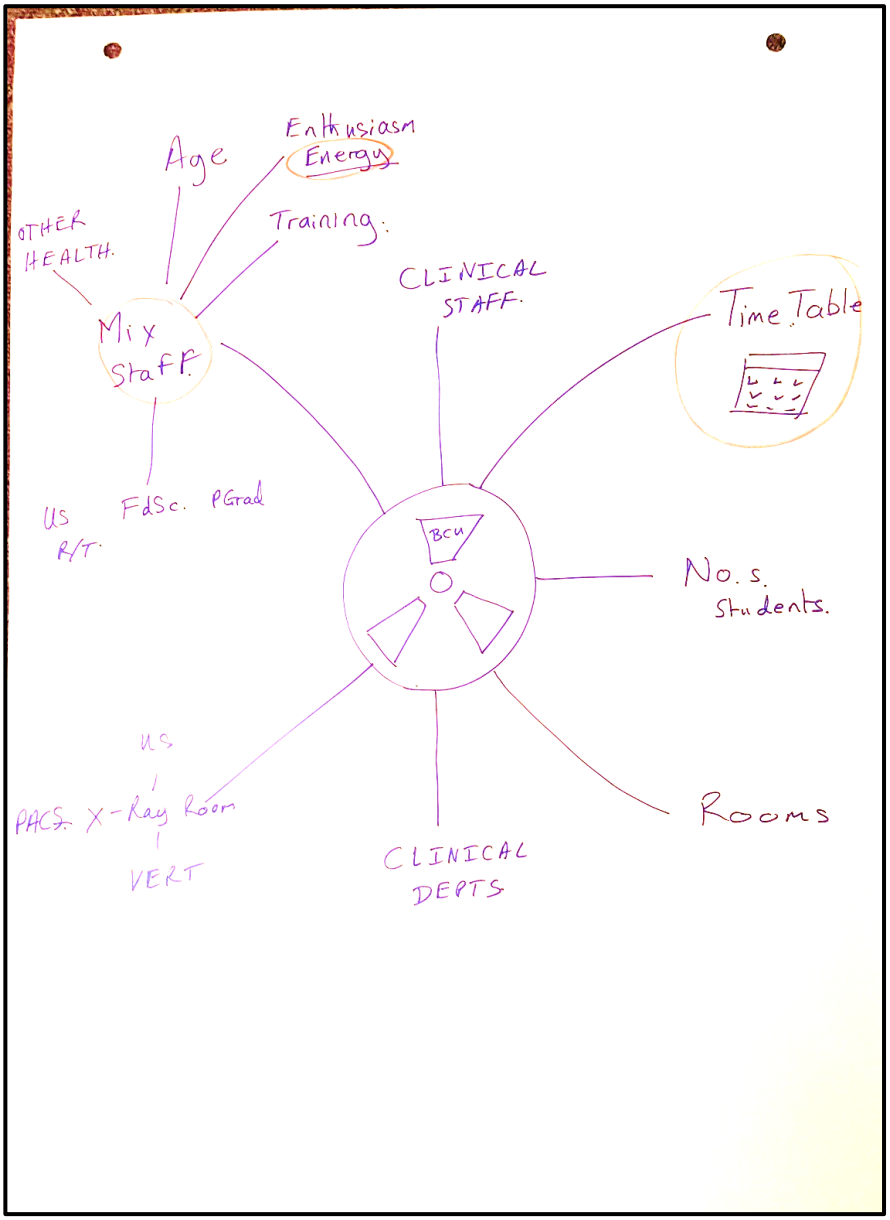

Figure Appendix A:1 Pilot Study Drawing 1

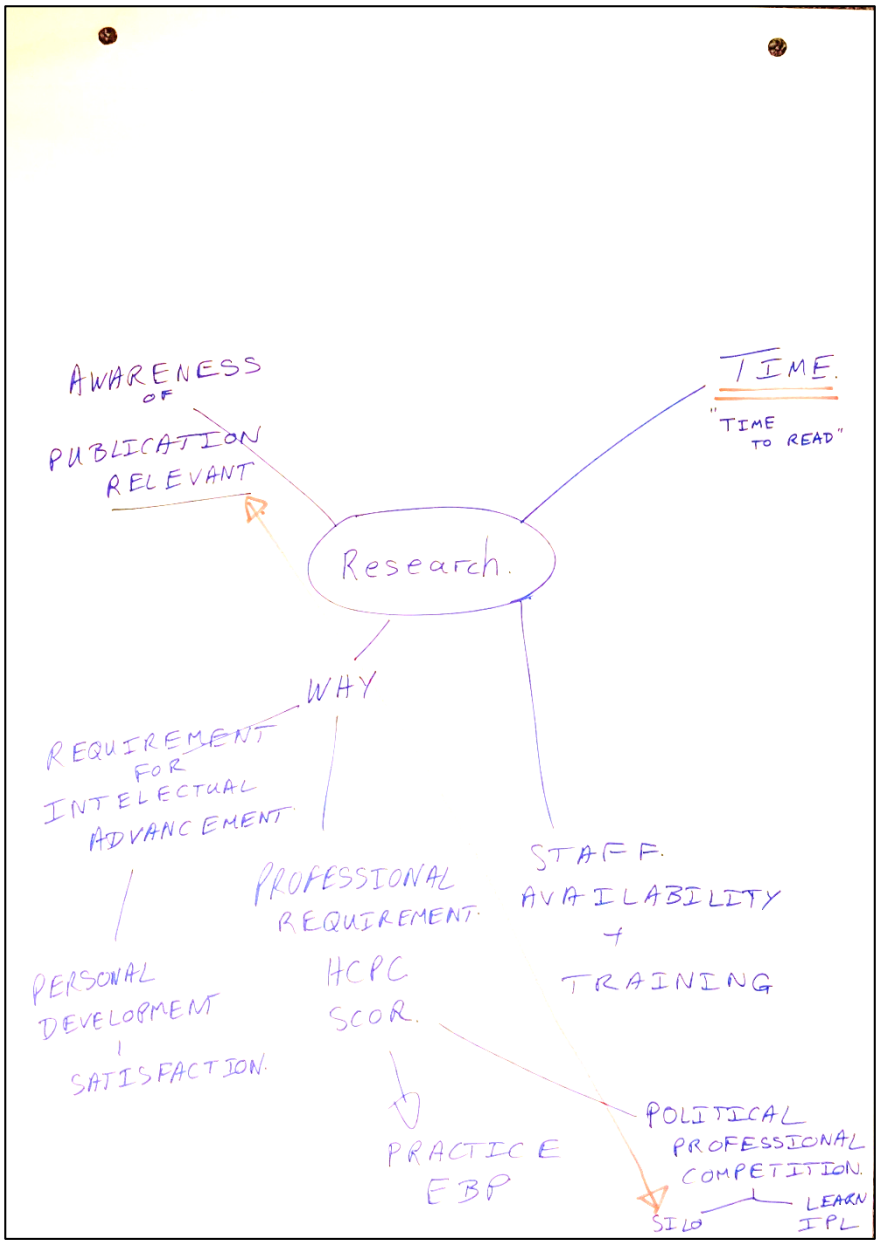

Figure Appendix A:2 Pilot Study Drawing 2

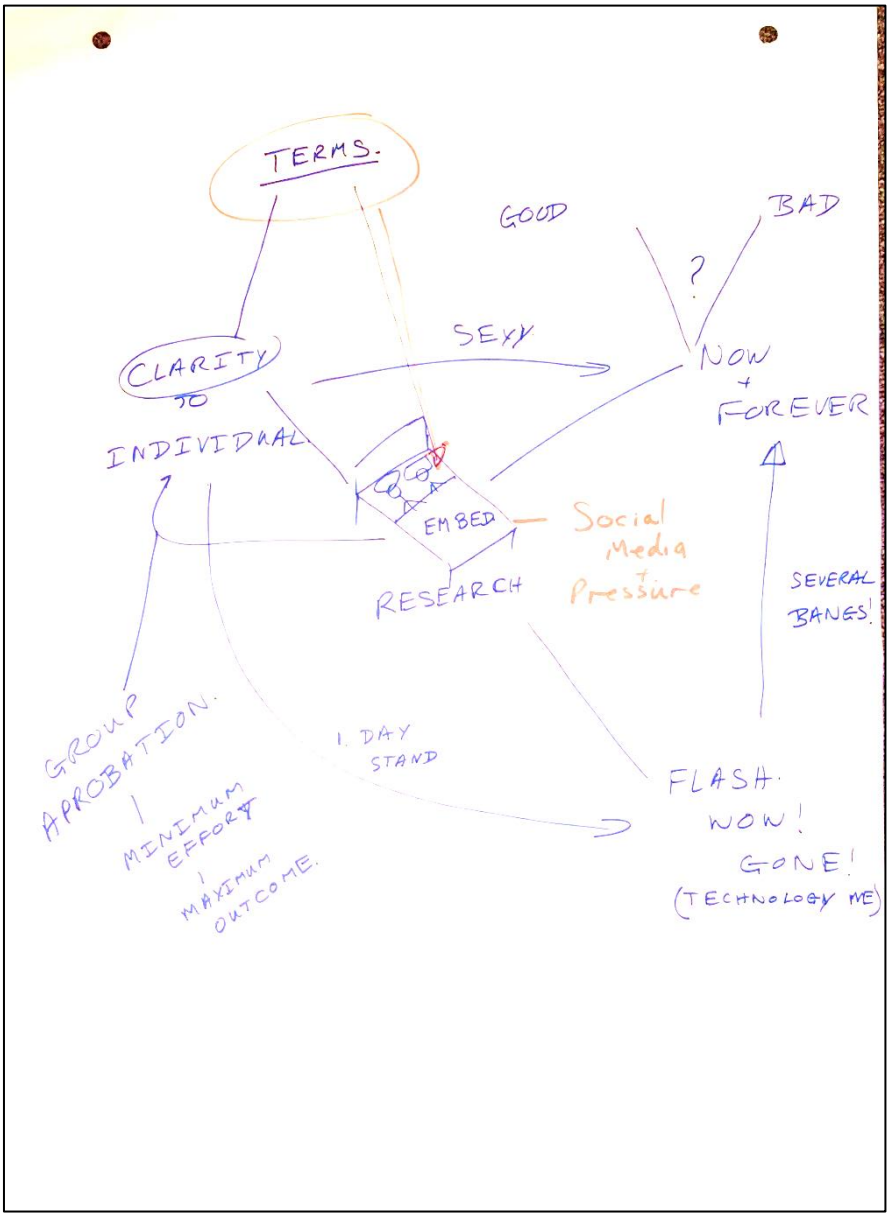

Figure Appendix A:3 Pilot Study Drawing 3

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Appendix B. **Participant Information Leaflet**

REDACTED

Participant Information Leaflet

As part of my Professional Doctorate in Education (EdD) I am undertaking a research project called:

'Exploring and Understanding the Positionality of Research and its Pedagogy in the UK Radiography Profession'.

The aims of this research project are:

1. To develop an innovative use of imagery in data collection and presentation to maintain the importance of images, their interpretation, and their use in a reflection of the practices of the radiography profession.

2. To understand teaching pedagogies and the perceived constraints on teaching from the perspective of radiography education professionals and students with the long term aim of improving the quality and quantity of research output in the radiography profession.

3. To understand the current position of research within the radiography profession by discovering and evaluating the important historical and current influences which inform and hinder the drive within this 'new' profession to make research fundamental to its identity.

The research questions are:

1. Why is a research base important for the radiography profession?

2. What are the approaches used by and perceived constraints on, radiography educators in their endeavours to teach research in the radiography curriculum?

3. What are the radiography educators' perspectives on how undergraduate and postgraduate radiography students perceive the embedding of research in the radiography curriculum?

4. How do undergraduate and postgraduate radiography students themselves perceive the embedding of research in the radiography curriculum?

Invitation to Participate

I would like to invite you to take part in this research because you are an academic staff member or student in the Department of Radiography at REDACTED and I would value your opinions and thoughts around research and its pedagogy (how we teach research) in radiography.

Your participation is entirely voluntary and whether you take part or not your work or studies and our professional relationship will not be affected.

If you agree to be interviewed, I will first ask you to complete the consent form attached. I would then like to ask you for an hour of your time, at a time to suit you, at REDACTED to talk about my research topics and to have a go at drawing your thoughts on paper. I intend, with your permission, to make an audio recording of our conversation, and to digitise any drawings made for future analysis. You will have the opportunity to check the transcription of your interview for accuracy and I may ask you to clarify any wording or images at a later date.

There are no financial benefits or risks to taking part but your views may help address some of the issues I am researching and in future have an influence on how we embed research in the curriculum and the profession.

All the interview transcripts and drawings will be kept securely and anonymously for data analysis. I will ask you if you agree to let me use your anonymised words and images when disseminating my research and will only do this with your permission. Your data will be kept in an encrypted file and only discussed with my supervisors in an anonymous format. All primary data will be destroyed after no more than 5 years, in line with the REDACTED REDACTED data protection policy.

If you decide to stop the interview at any point, or withdraw from the study up to two months after the interview you can do so without prejudice or penalty.

I welcome any questions you have about this research and will be pleased to answer any queries you have.

My Details

REDACTED

Supervisor

REDACTED

If you wish to make a complaint about anything regarding my research which you would rather not discuss with me or my supervisor, please contact:

REDACTED

Appendix C. **Participant Consent Form**

REDACTED

Participant Consent Form

As part of my Professional Doctorate in Education (EdD) I am undertaking a research project called:

'Exploring and Understanding the Positionality of Research and its Pedagogy in the UK Radiography Profession'.

The aims of this research project are:

1. To develop an innovative use of imagery in data collection and presentation to maintain the importance of images, their interpretation, and their use in a reflection of the practices of the radiography profession.

2. To understand teaching pedagogies and the perceived constraints on teaching from the perspective of radiography education professionals and students with the long term aim of improving the quality and quantity of research output in the radiography profession.

3. To understand the current position of research within the radiography profession by discovering and evaluating the important historical and current influences which inform and hinder the drive within this 'new' profession to make research fundamental to its identity.

Invitation to Participate

I would like to invite you to take part in this study, and to consent to the following by writing your initials in the box against each statement to indicate your agreement and consent.

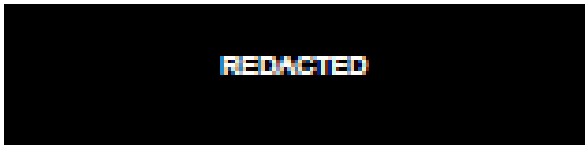
Statements	Your Initials
I have read and understood the information leaflet (attached)	
I have had the opportunity to ask questions about the research and my part in it	
I understand that my participation is entirely voluntary	
I agree to be interviewed	
I agree to be recorded during the interview	
I agree to allow my drawings to be digitised and used in data analysis	
I understand I can withdraw at any time without prejudice, up to 2 months after the date of the interview.	
I understand I have the right to confidentiality and anonymity and my data will be secured safely	
I agree to my quotes being used anonymously in reports and papers.	
I agree to my drawings being used anonymously in reports and papers.	

I welcome any questions you have about this research and will be pleased to answer any queries you have.

Participant Consent 9.9.17 V1.0

My Details

Supervisor



If you wish to make a complaint about anything regarding my research which you would rather not discuss with me or my supervisor, please contact:

Appendix D. **Interview Guide**

Thanks
Reminder confidentiality and anonymity
Can stop at any time and withdraw with no consequences for you
I will ask questions and ask you to give your answers and draw maps/diagrams on the paper.
Are you happy for me to record this interview?
And make digital copies of your drawings?

How long have you been teaching/studying radiography, diagnostic, radiotherapy, or both?

Have you done any (postgraduate) research yourself?

Do you think we should/need to include research in our teaching?

DRAWING 1 Question What are the influences on WHY we teach research to radiographers?

- Prompt- policies, curriculum, SOR, HCPC

DRAWING 2 Question What are the influences on HOW we teach research to radiographers at this university?

- Prompt- policies, curriculum, SOR, HCPC

DRAWING 3 Question STAFF(How) do you think we embed research in the whole curriculum?

- Prompt- What factors make it difficult to teach/embed research in the whole curriculum
- Prompt- How do you think students perceive that embedding of research?

DRAWING 3 Question STUDENTS (How) do you think we embed research in the whole curriculum?

How could we better embed research in the curriculum/teaching?

What is the one thing we could change now?

How will you/do you think students use research in your job

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Appendix E. **Example of a vignette written after data collection**

This short vignette demonstrates how I used the interview data to think through the themes being talked about. Extracts from the vignette and transcriptions were used verbatim to add to the boxes on the PowerPoint slides for the Co-Constructed Depictions. I use the pronoun 'they' in this vignette to preserve the anonymity of the participant.

This third-year radiotherapy student (P1 S) had some previous experience of research in a data collecting capacity before coming to the university. They thought that research was included on the course to '*keep our interest in the subject [of research] …*', since the aim of doing research is to *'develop the profession as it were'* so we '*don't get left behind'*. For them this meant development of ideas and ways of working, as well as techniques. They also spoke about their own growing and improving habitus as a radiographer, seeing the importance of continual professional development (CPD) and research awareness in staff entering the profession. This was later contradicted in part when they said that being ready for clinical demands is more important than research capacity.

When asked about outside influences on teaching research they mentioned the professional bodies, the SCoR and HCPC, but also suggested the NHS itself as until recently students received a bursary to do this course, and influences of other HEIs, in the form of collaboration. Within Midlands University they felt that the lecturers' experience in both planning the course, and particularly their experience in research, influence the way we teach research. The only internal influence mentioned was *'student feedback'.*

Looking back over the last three years they were able to identify research embedded in each year, *'in our assignments, in the essays that we write we have to do a lot of research you know lit research and background research'* in the first year, through *'the EBP…module'* in the second year, up to the third year which is *'pretty much all research based – it feels like that'*. They thought there were two types of research here though, one type involved finding

out about things for writing essays, whereas the other type is *'like research you conduct yourself like primary research and I didn't ...I know there is a differentiation between the two'.*

Although they found the research proposal assignment difficult, they felt with some more practice and understanding they might enjoy doing research in a clinical setting.

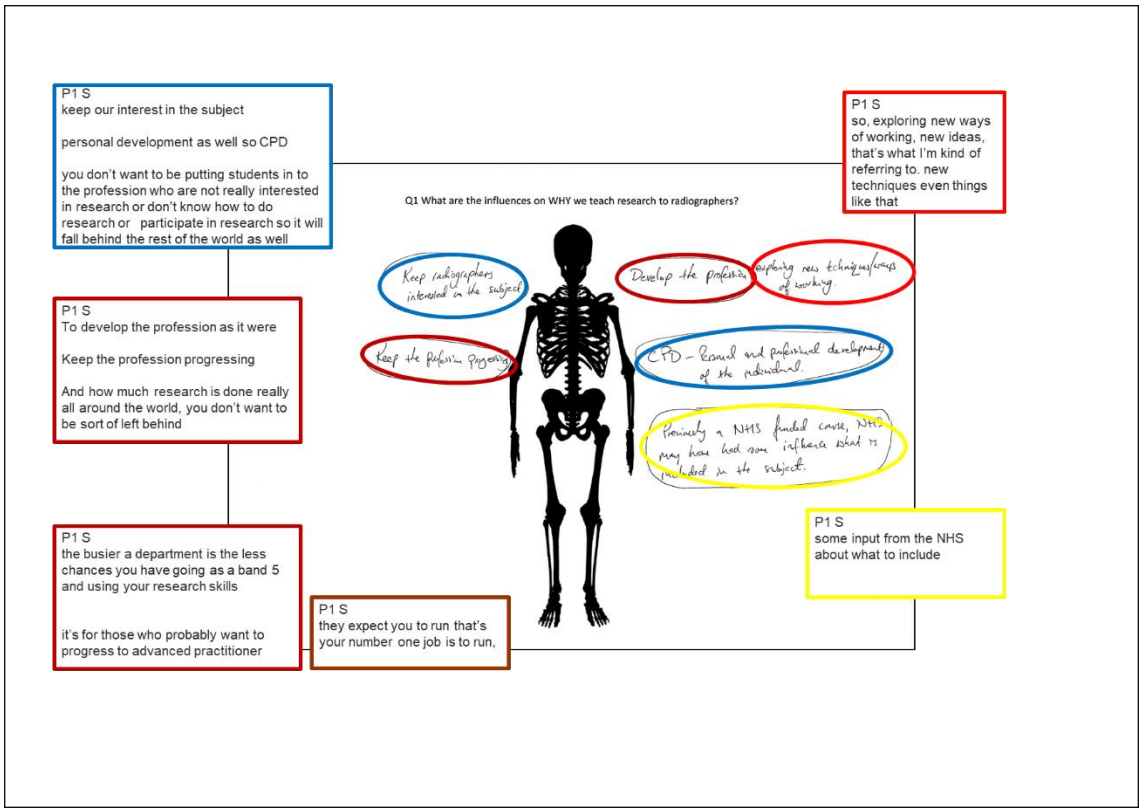
Improvements to embedding research in the curriculum were identified. They felt that the proposal should be in the second year, so *'in the third year you could do it, conduct a little bit of research'*. Even going through the process of writing had helped because they understood things better by doing them. Producing the assignment (research proposal) was a way of evidencing their learning, so needed to be included in the curriculum.

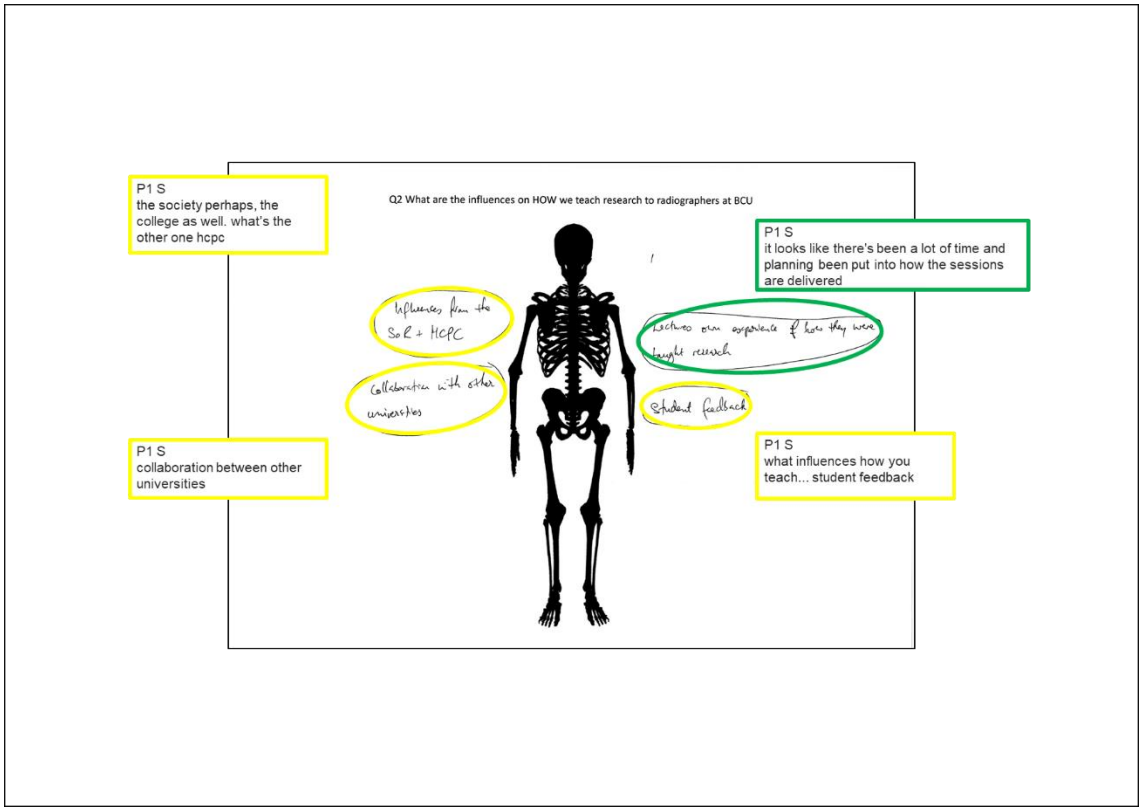
Potential improvements included subscriptions to on-line data analysis tools as the cost for this student prevented them from using this resource that could, they felt, have saved them time and energy.

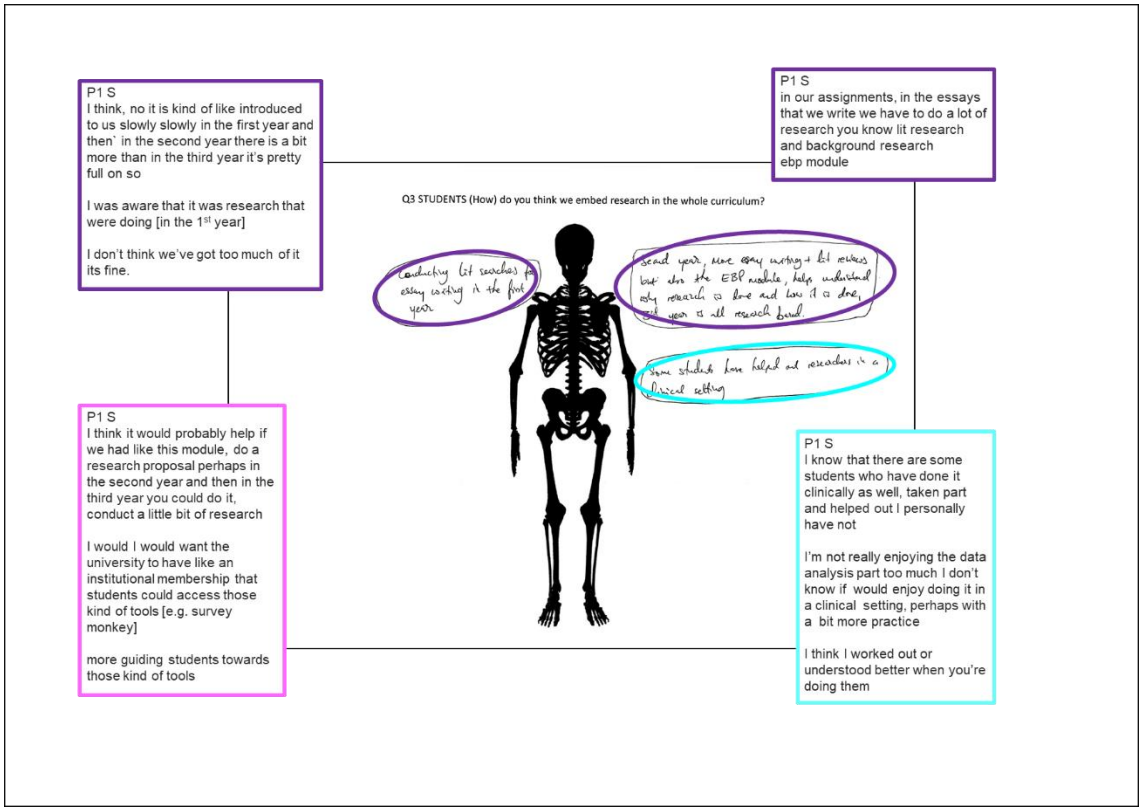
This student was due to qualify soon after the data collection and felt that a busy department would *'expect you to run [a list of patients in the department] that's your number one job is to run'* and would be too busy to give Band 5 radiographers the chance to use their research skills. Practical research was seen as something for those who wanted to become advanced practitioners, doing research *'geared towards the departments needs and what the demand is rather than what your particular interest is'.*

Appendix F. **Co-Constructed Depictions**

P1 Student

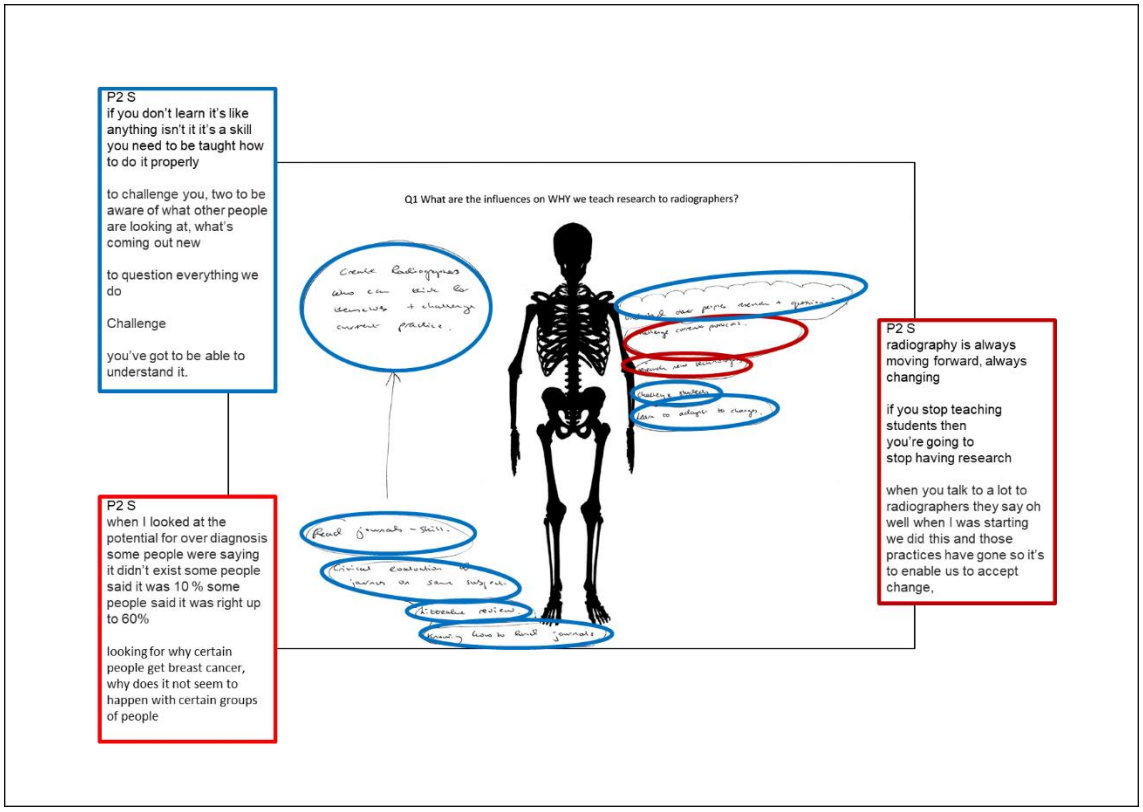


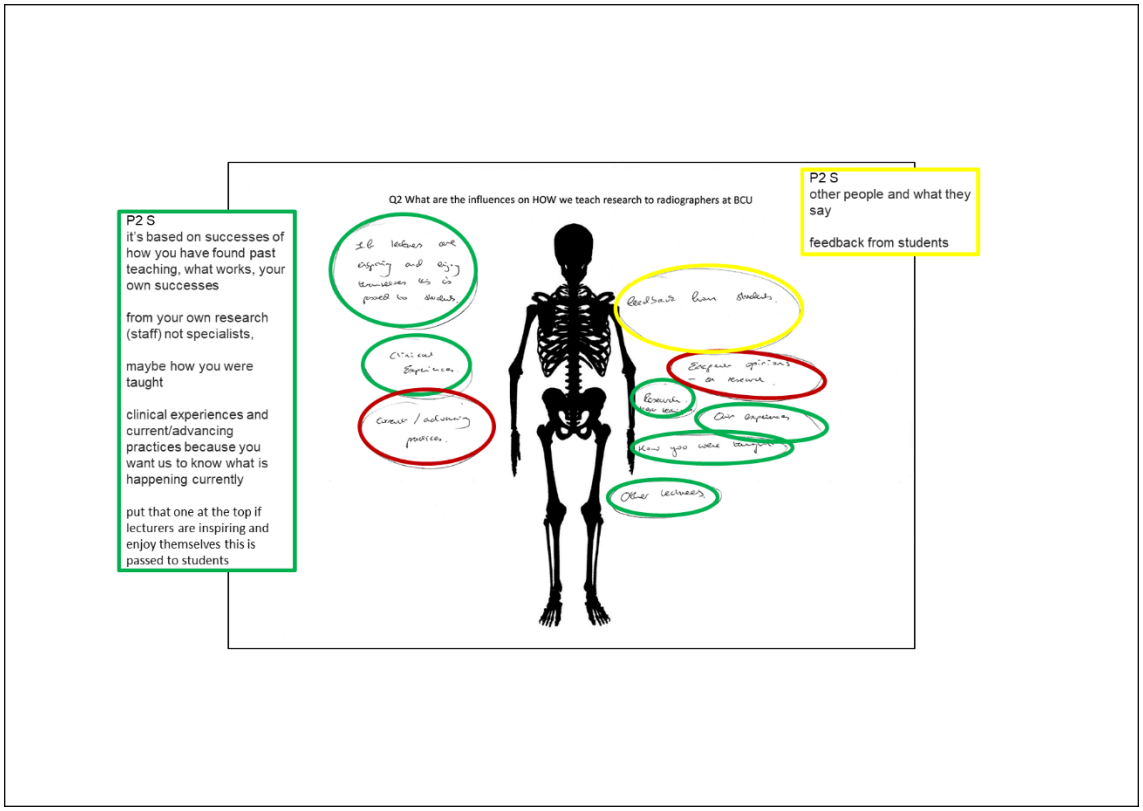


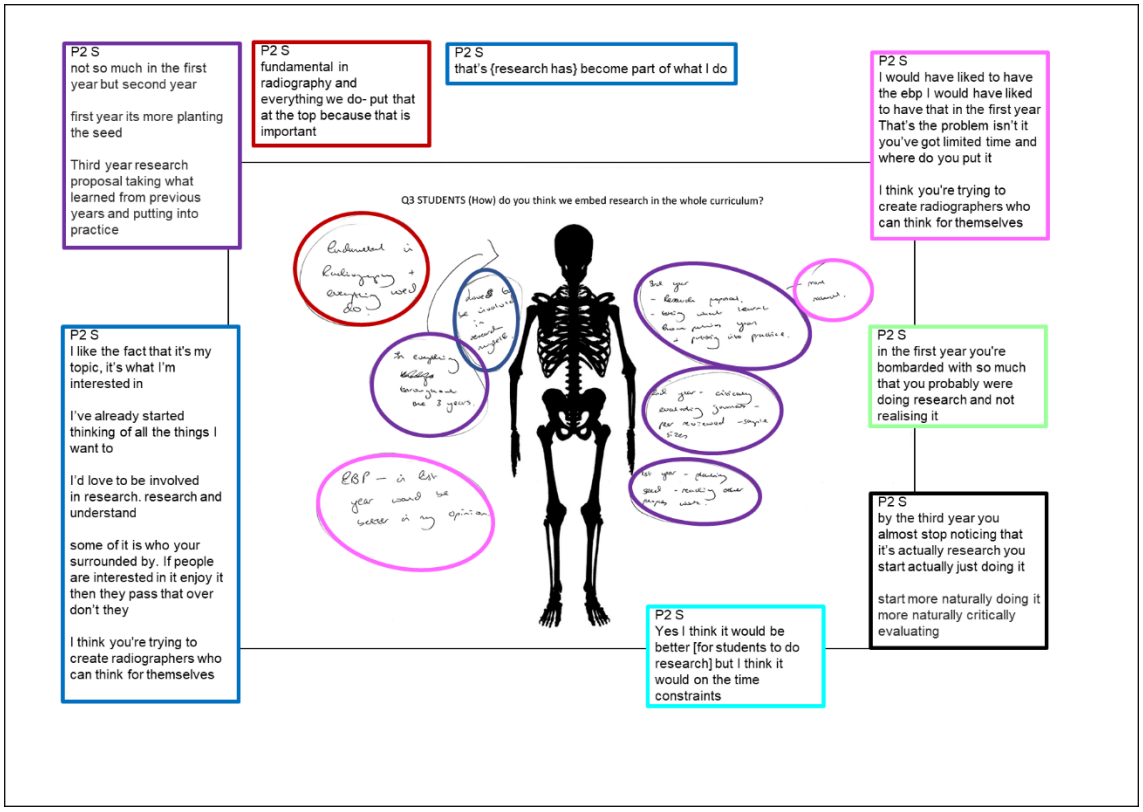


Colour Key for Co-Constructed Depiction							
Habitus- all		Hit the ground running		Influences		Normalise research	
Habitus of lecturers		Professional field- Profession oriented		Constraints		Student participation in research	
Student constraints- habitus		Professional field- patient oriented		Suggestions for improvements		Embedding research- curriculum	

P2 Student


P2 S
if you don't learn it's like anything isn't it it's a skill you need to be taught how to do it properly
to challenge you, two to be aware of what other people are looking at, what's coming out new
to question everything we do
Challenge
you've got to be able to understand it.
Q1 What are the influences on WHY we teach research to radiographers?
P2 S
radiography is always moving forward, always changing
if you stop teaching students then you're going to stop having research
when you talk to a lot to radiographers they say oh well when I was starting we did this and those practices have gone so it's to enable us to accept change,
P2 S
when I looked at the potential for over diagnosis some people were saying it didn't exist some people said it was 10 % some people said it was right up to 60%
looking for why certain people get breast cancer, why does it not seem to happen with certain groups of people


P2 S
it's based on successes of how you have found past teaching, what works, your own successes
from your own research (staff) not specialists,
maybe how you were taught
clinical experiences and current/advancing practices because you want us to know what is happening currently
put that one at the top if lecturers are inspiring and enjoy themselves this is passed to students
Q2 What are the influences on HOW we teach research to radiographers at BCU
P2 S
other people and what they say
feedback from students



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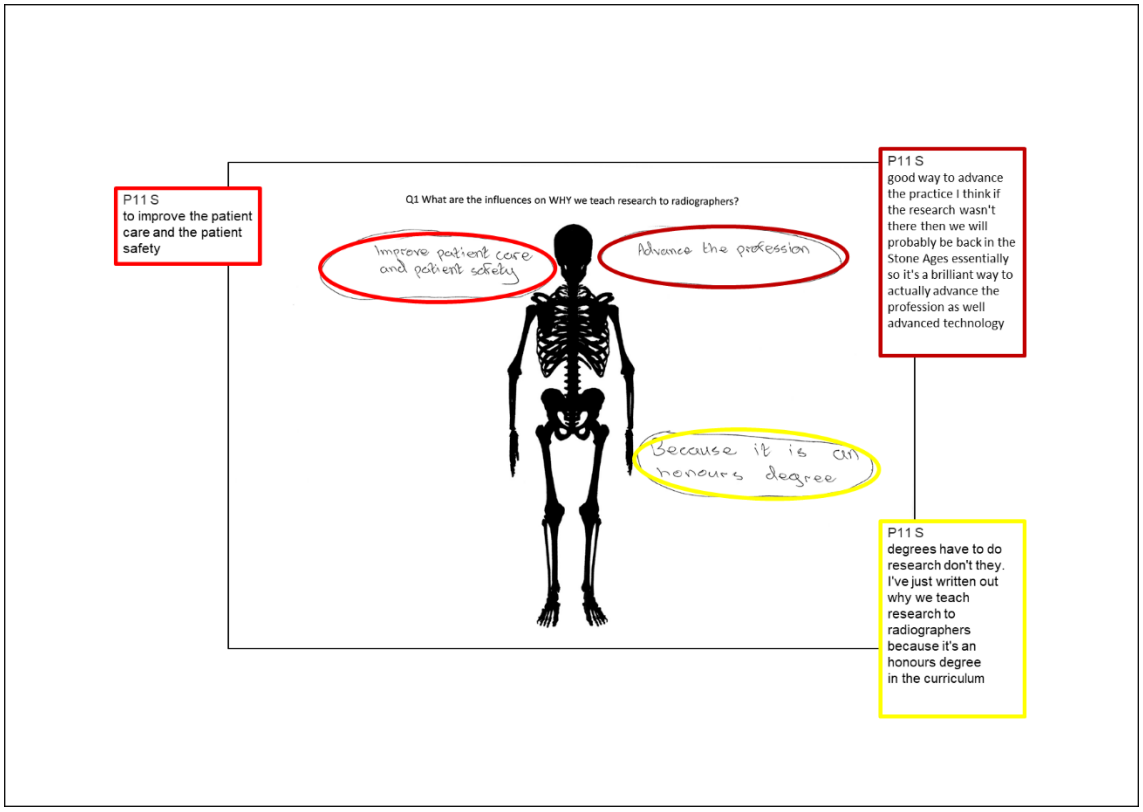
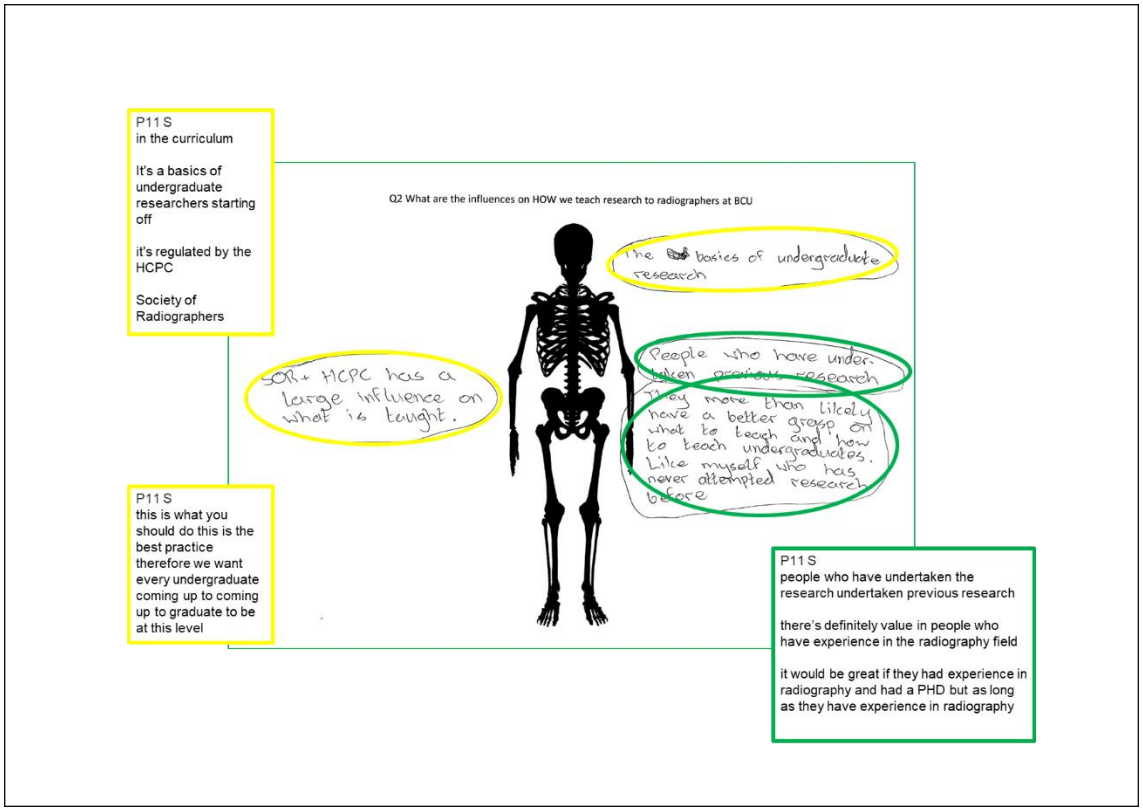
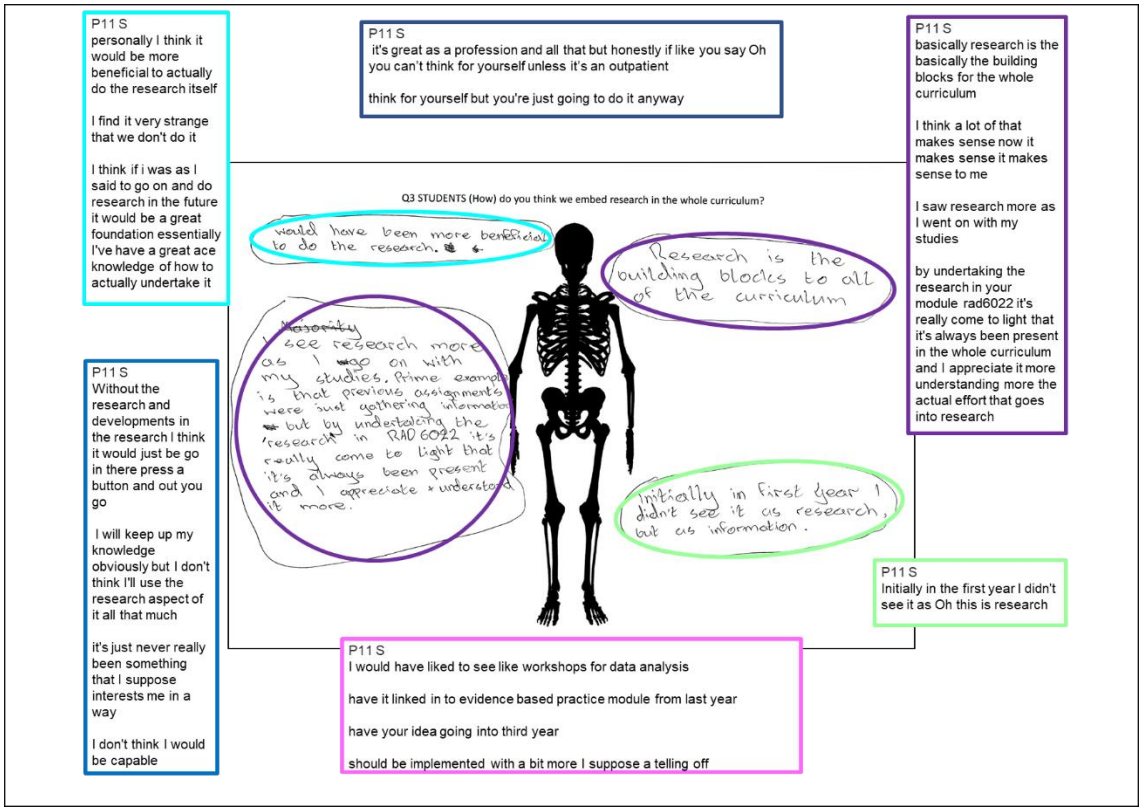
P11 Student


P11 S
to improve the patient care and the patient safety
Q1 What are the influences on WHY we teach research to radiographers?
Improve patient care and patient safety
Advance the profession
Because it is an honours degree
P11 S
good way to advance the practice I think if the research wasn't there then we will probably be back in the Stone Ages essentially so it's a brilliant way to actually advance the profession as well advanced technology
P11 S
degrees have to do research don't they. I've just written out why we teach research to radiographers because it's an honours degree in the curriculum


P11 S
in the curriculum
It's a basics of undergraduate researchers starting off
it's regulated by the HCPC
Society of Radiographers
Q2 What are the influences on HOW we teach research to radiographers at BCU
The basics of undergraduate research
SOR + HCPC has a large influence on what is taught.
People who have undertaken previous research
They more than likely have a better grasp on what to teach and how to teach undergraduates. Like myself who has never attempted research before
P11 S
this is what you should do this is the best practice therefore we want every undergraduate coming up to coming up to graduate to be at this level
P11 S
people who have undertaken the research undertaken previous research
there's definitely value in people who have experience in the radiography field
it would be great if they had experience in radiography and had a PHD but as long as they have experience in radiography



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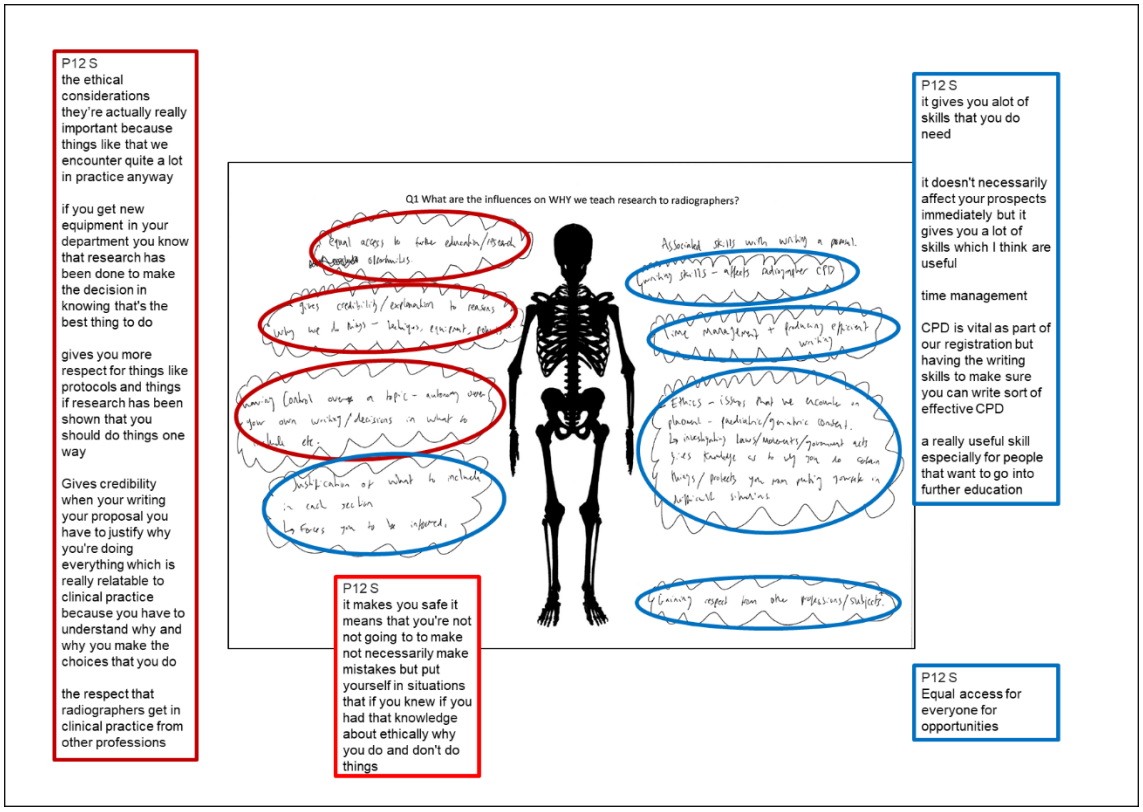
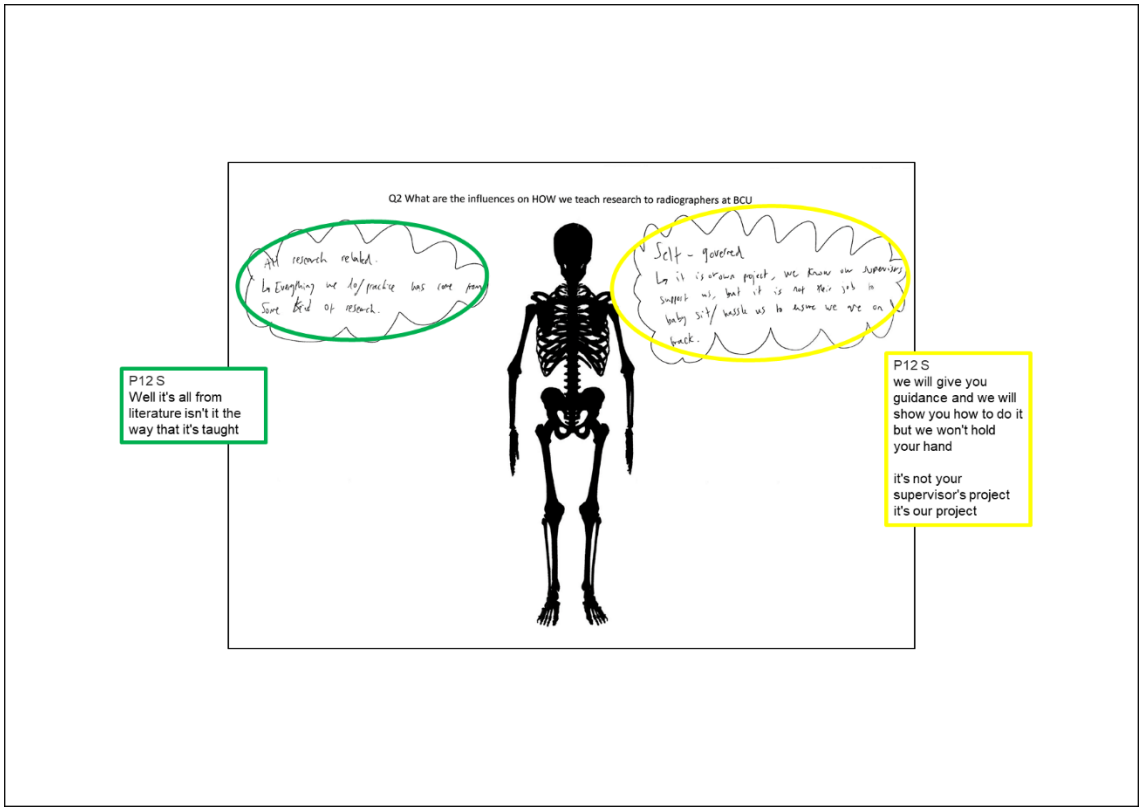
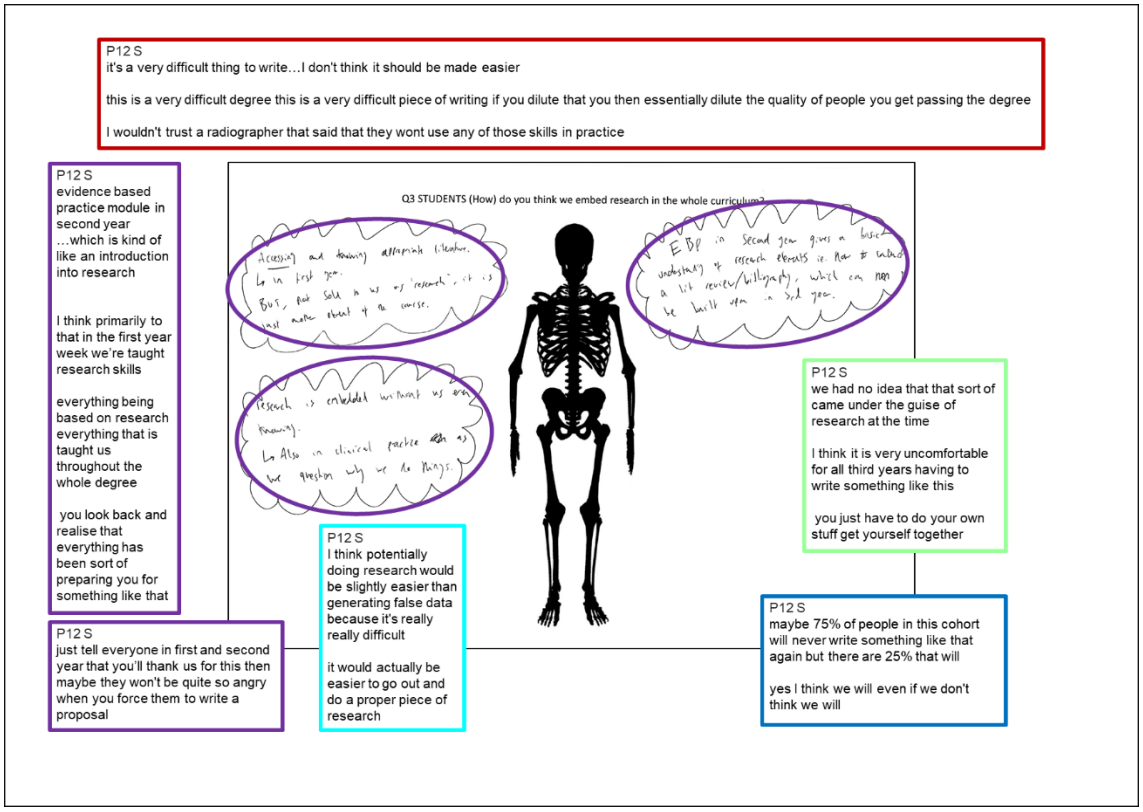
P12 Student


P12 S
the ethical considerations they're actually really important because things like that we encounter quite a lot in practice anyway
if you get new equipment in your department you know that research has been done to make the decision in knowing that's the best thing to do
gives you more respect for things like protocols and things if research has been shown that you should do things one way
Gives credibility when your writing your proposal you have to justify why you're doing everything which is really relatable to clinical practice because you have to understand why and why you make the choices that you do
the respect that radiographers get in clinical practice from other professions
Q1 What are the influences on WHY we teach research to radiographers?
P12 S
it makes you safe it means that you're not not going to to make not necessarily make mistakes but put yourself in situations that if you knew if you had that knowledge about ethically why you do and don't do things
P12 S
it gives you alot of skills that you do need
it doesn't necessarily affect your prospects immediately but it gives you a lot of skills which I think are useful
time management
CPD is vital as part of our registration but having the writing skills to make sure you can write sort of effective CPD
a really useful skill especially for people that want to go into further education
P12 S
Equal access for everyone for opportunities


Q2 What are the influences on HOW we teach research to radiographers at BCU
P12 S
Well it's all from literature isn't it the way that it's taught
P12 S
we will give you guidance and we will show you how to do it but we won't hold your hand
it's not your supervisor's project it's our project



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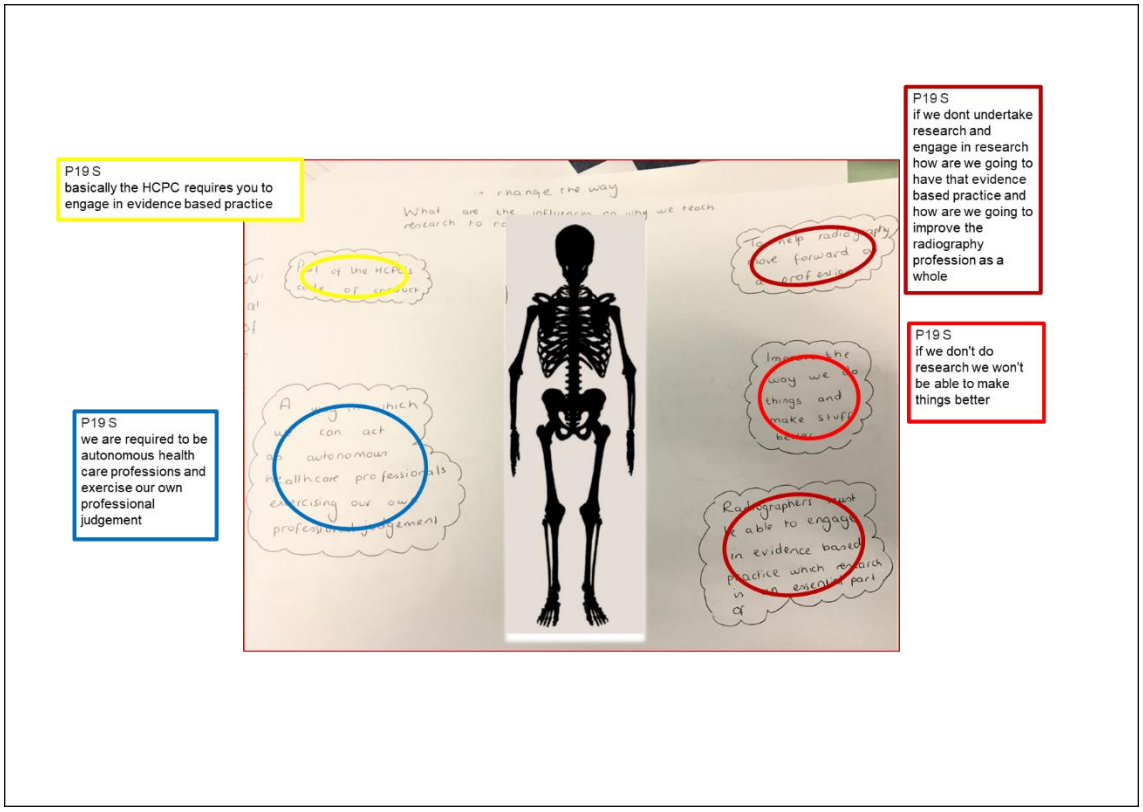
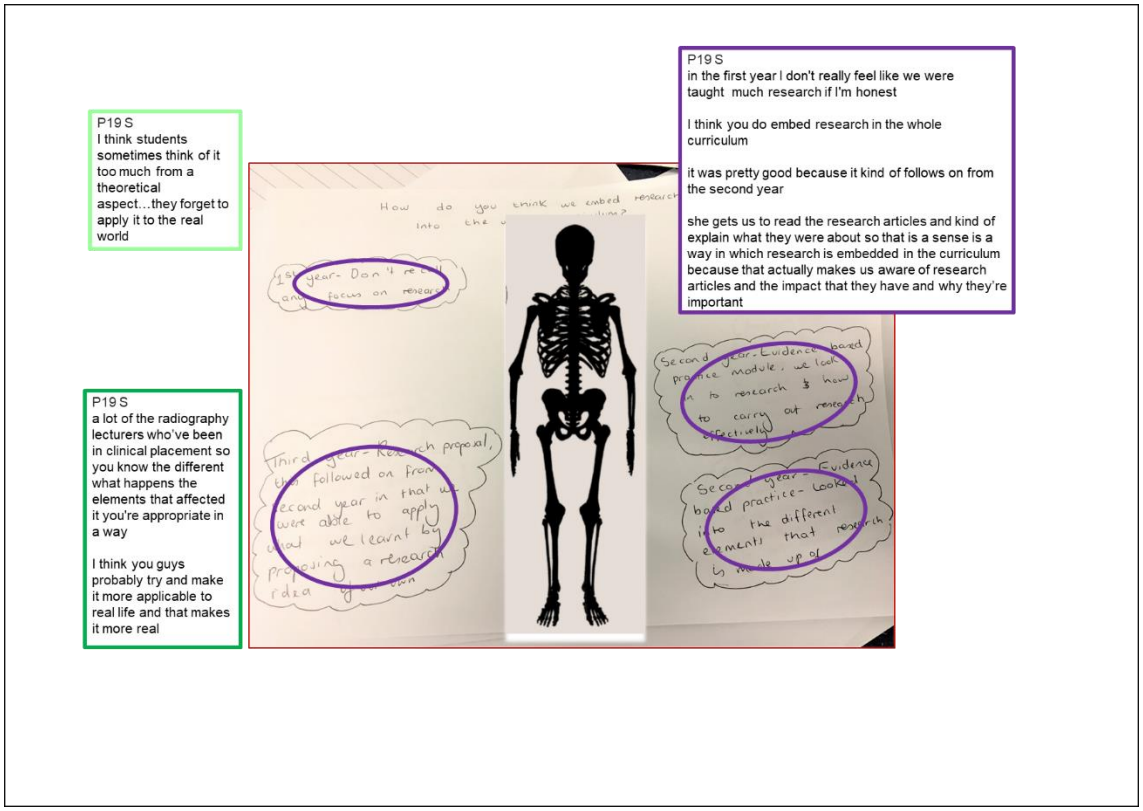
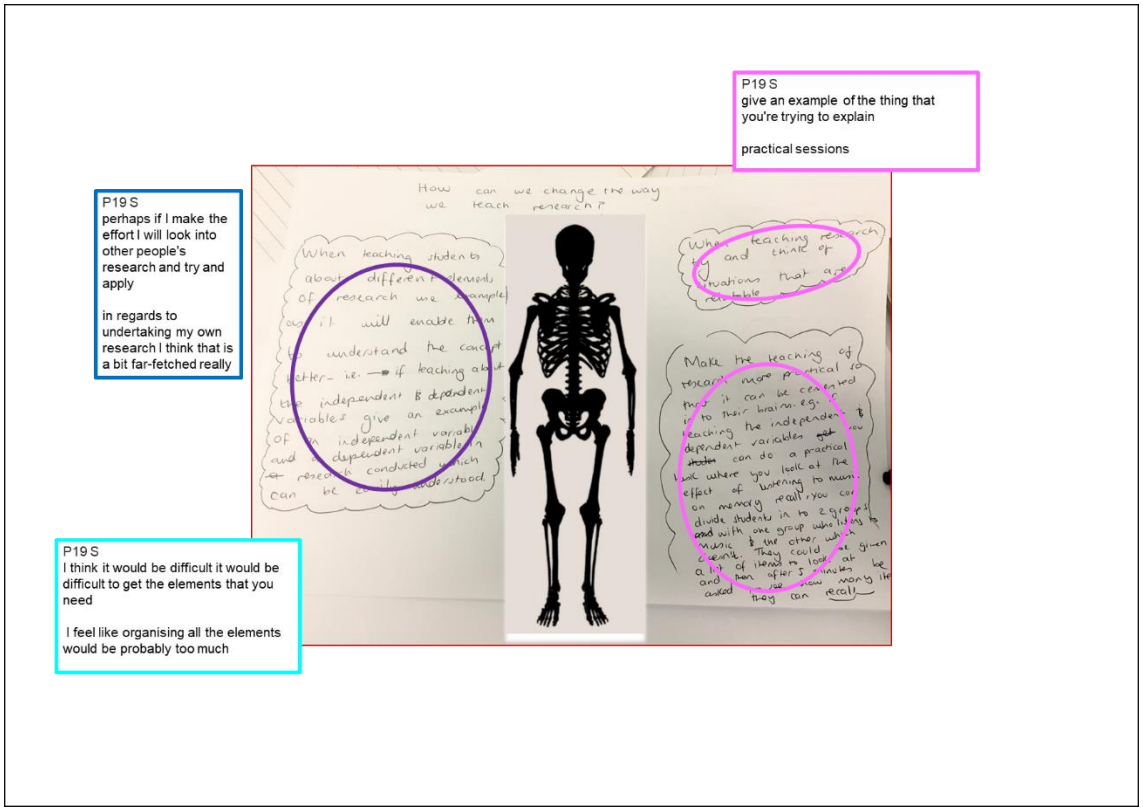
Student constraints- habitus		Professional field- patient oriented		Suggestions for improvements		Embedding research- curriculum	

P19 Student


P19 S
basically the HCPC requires you to engage in evidence based practice
P19 S
if we dont undertake research and engage in research how are we going to have that evidence based practice and how are we going to improve the radiography profession as a whole
P19 S
if we don't do research we won't be able to make things better
P19 S
we are required to be autonomous health care professions and exercise our own professional judgement


P19 S
I think students sometimes think of it too much from a theoretical aspect…they forget to apply it to the real world
P19 S
in the first year I don't really feel like we were taught much research if I'm honest
I think you do embed research in the whole curriculum
it was pretty good because it kind of follows on from the second year
she gets us to read the research articles and kind of explain what they were about so that is a sense is a way in which research is embedded in the curriculum because that actually makes us aware of research articles and the impact that they have and why they're important
P19 S
a lot of the radiography lecturers who've been in clinical placement so you know the different what happens the elements that affected it you're appropriate in a way
I think you guys probably try and make it more applicable to real life and that makes it more real



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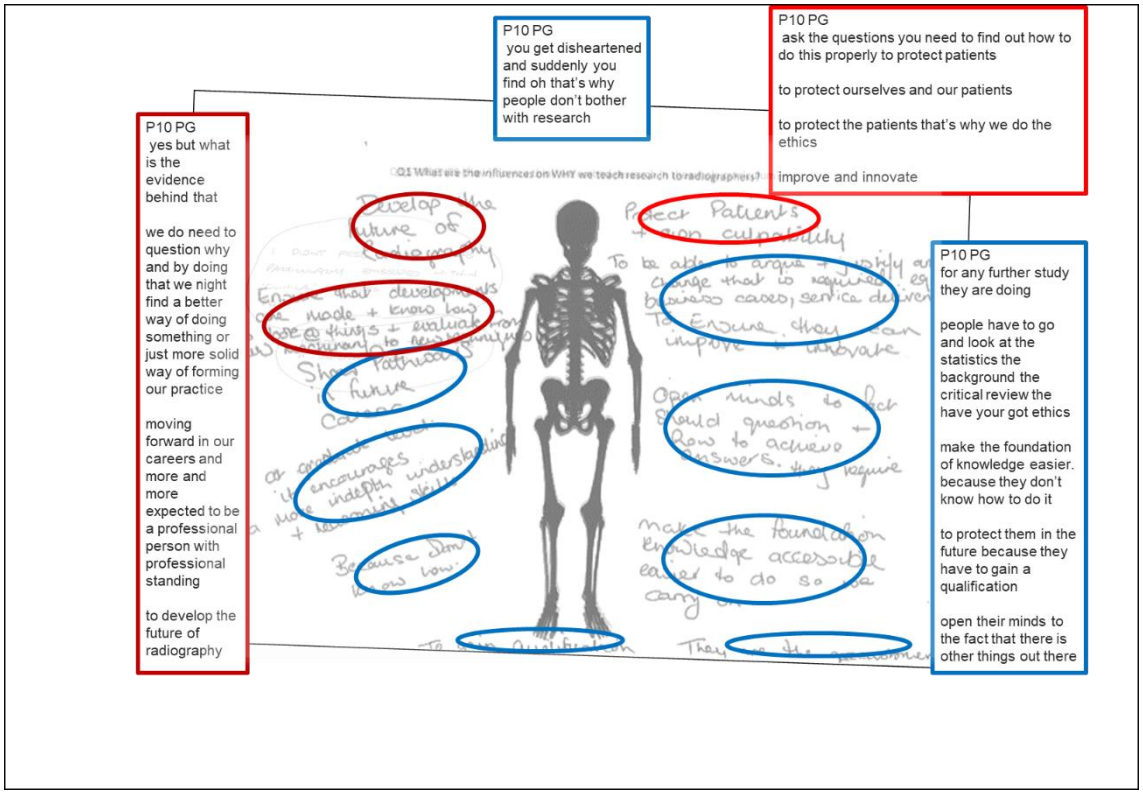
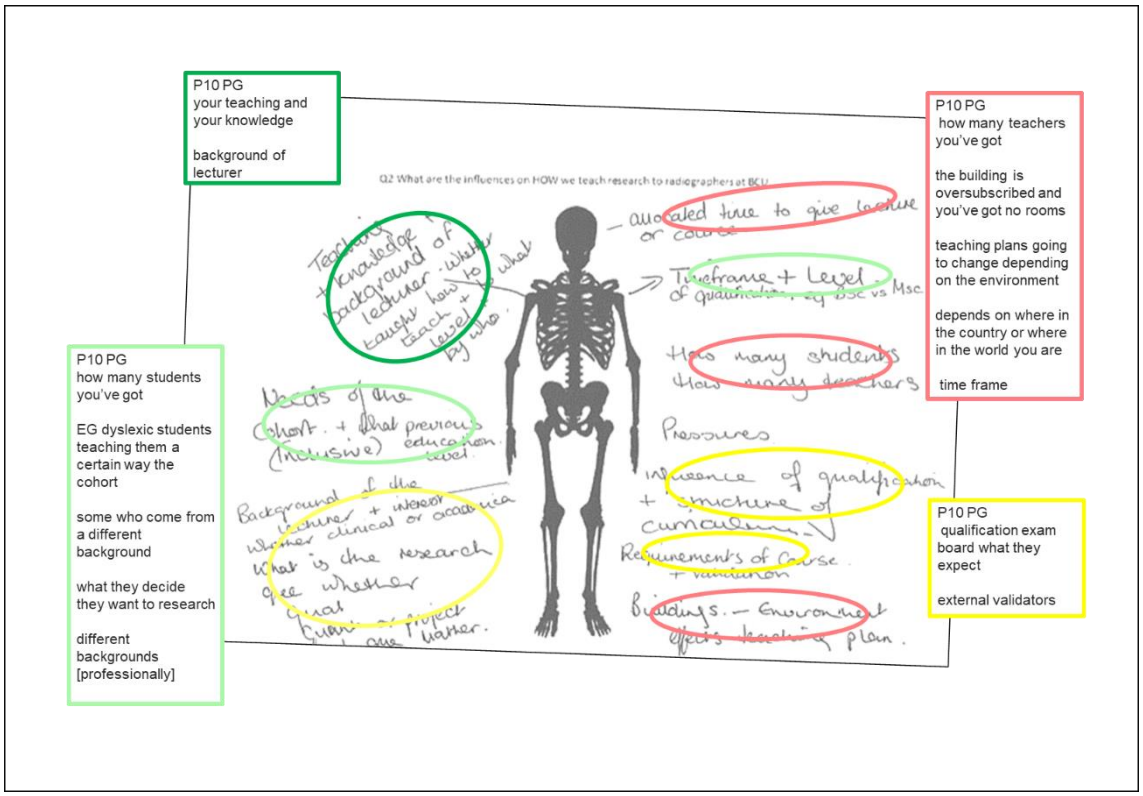
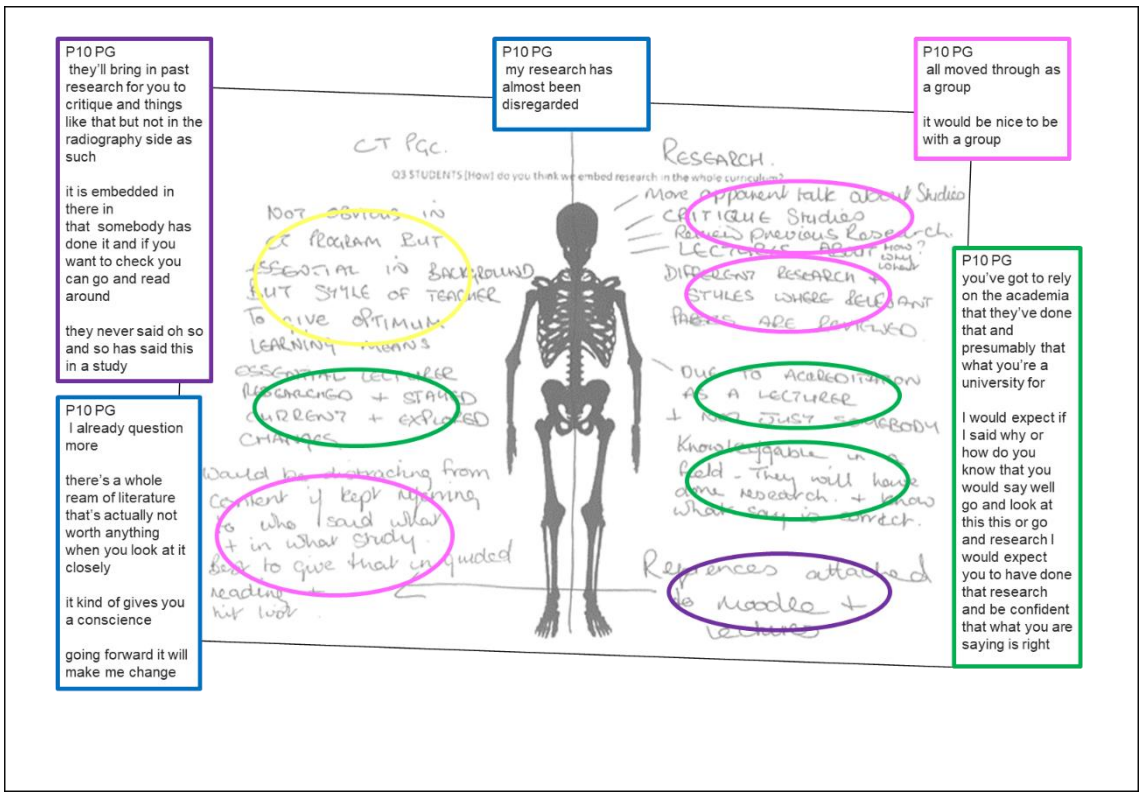
Student constraints- habitus		Professional field- patient oriented		Suggestions for improvements		Embedding research- curriculum	

P10 Postgraduate Student







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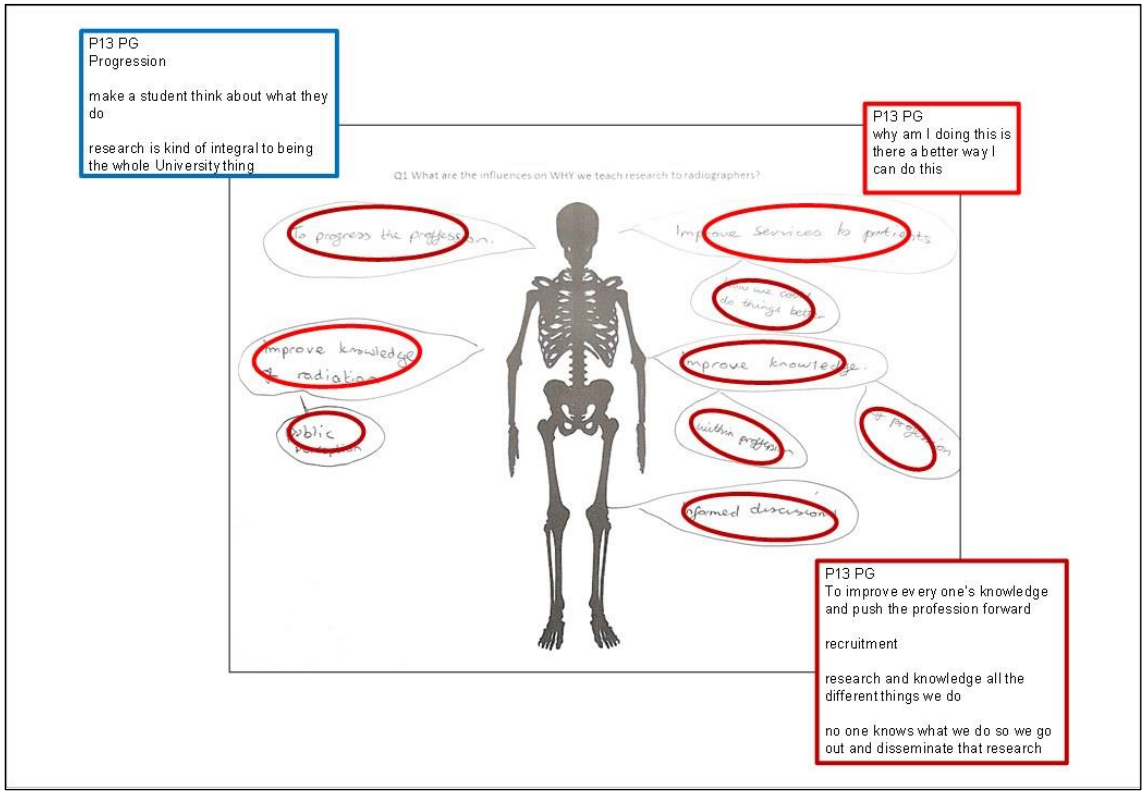
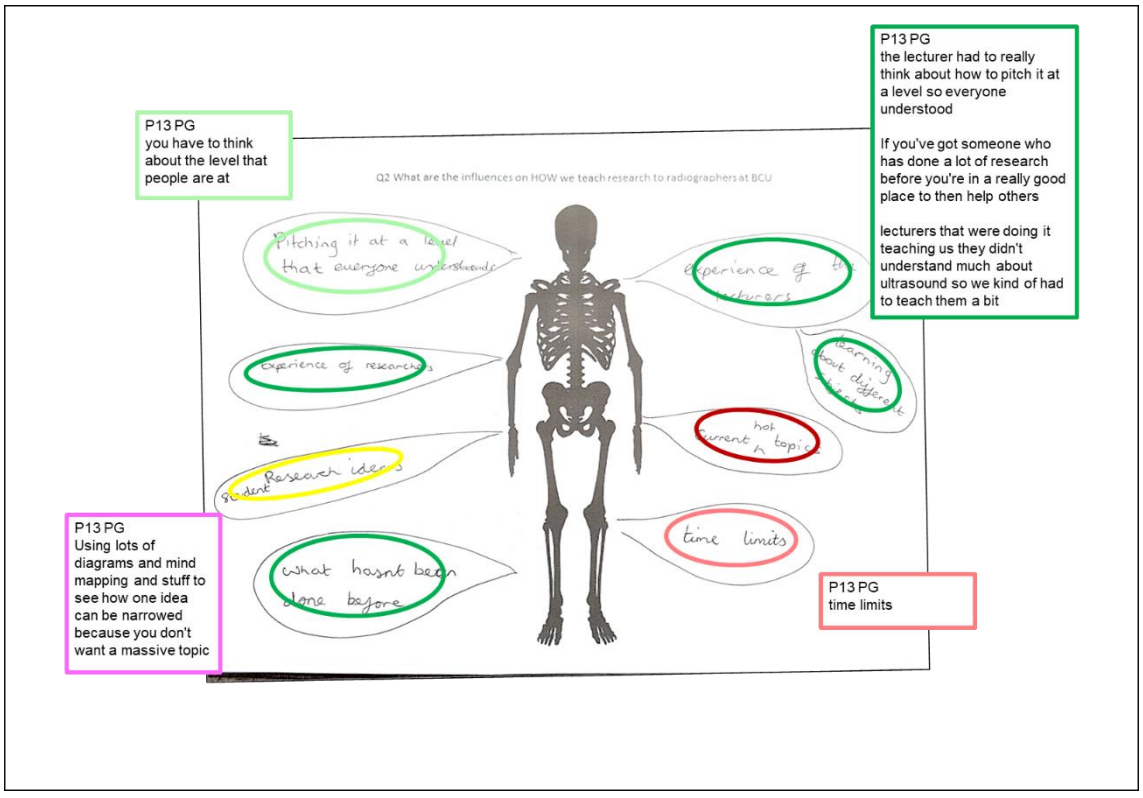
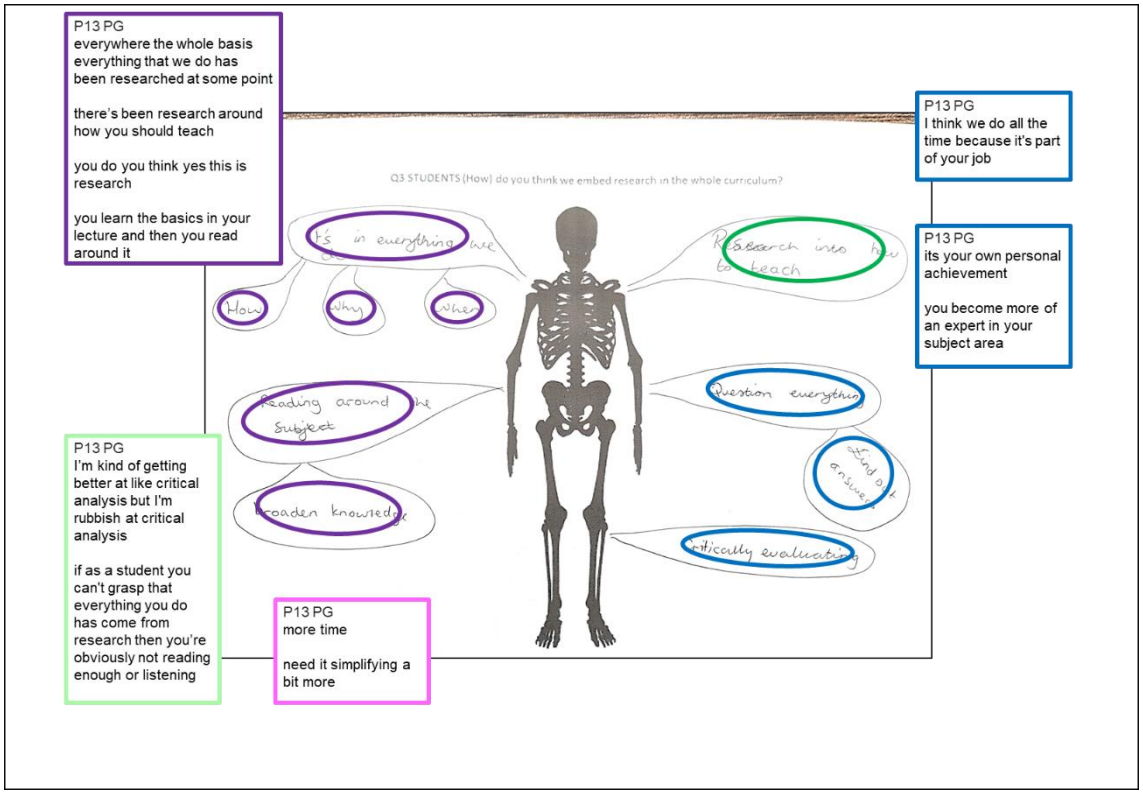
P13 Postgraduate Student







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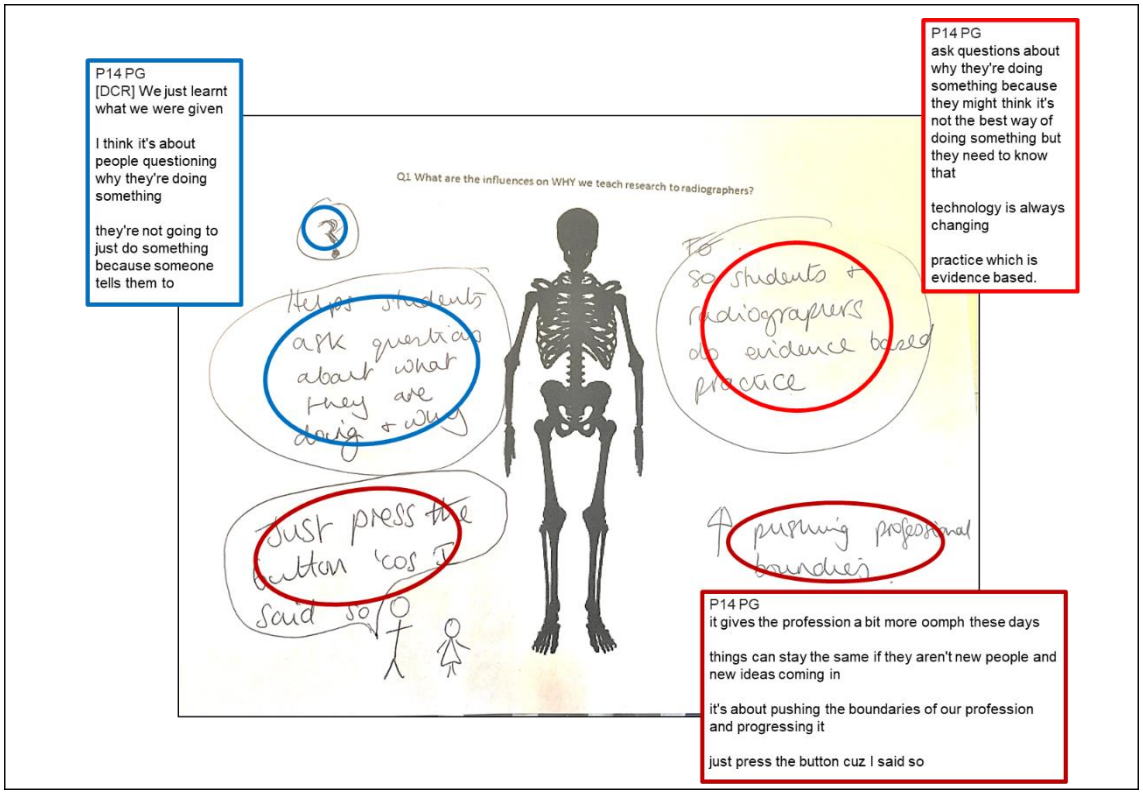
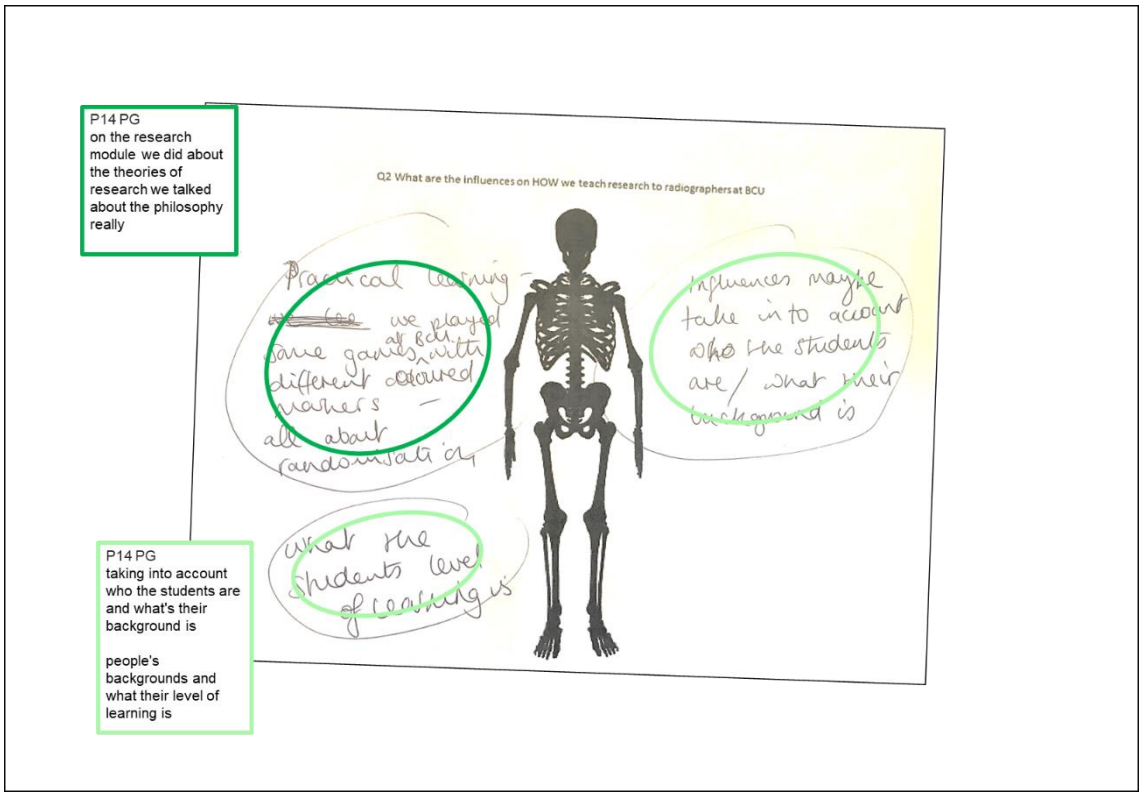
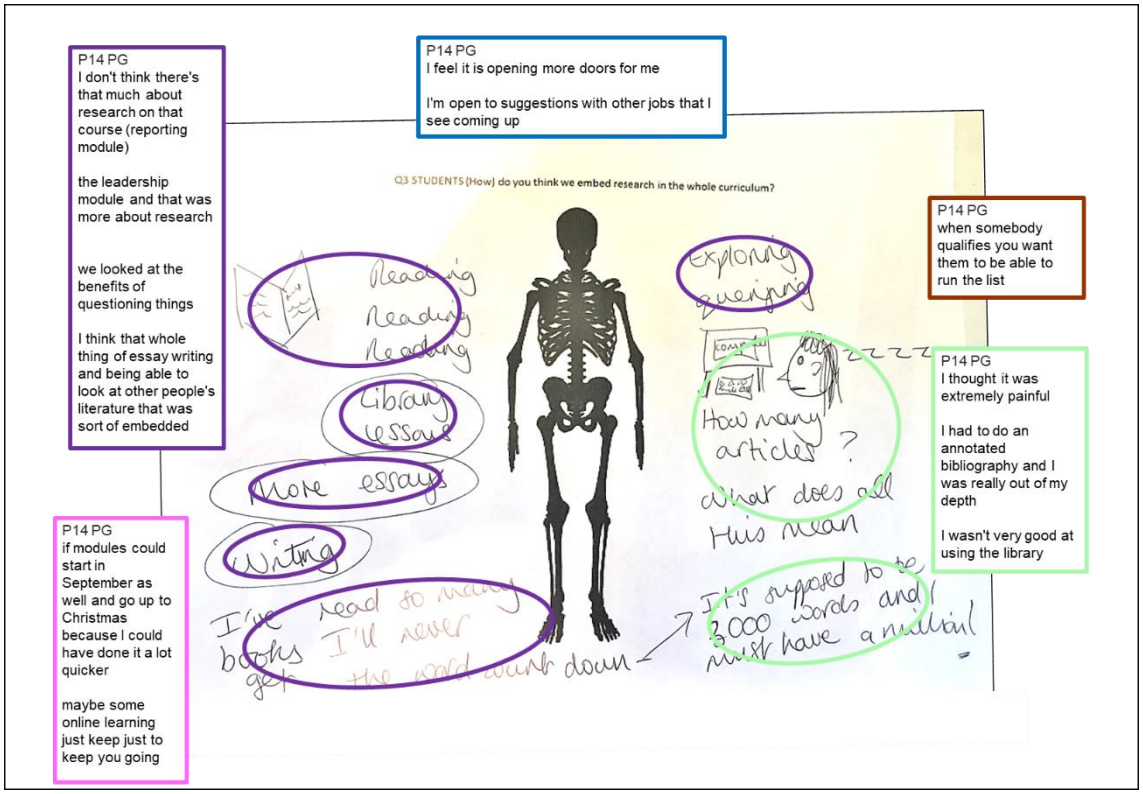
Student constraints- habitus		Professional field- patient oriented		Suggestions for improvements		Embedding research- curriculum	

P14 Postgraduate Student







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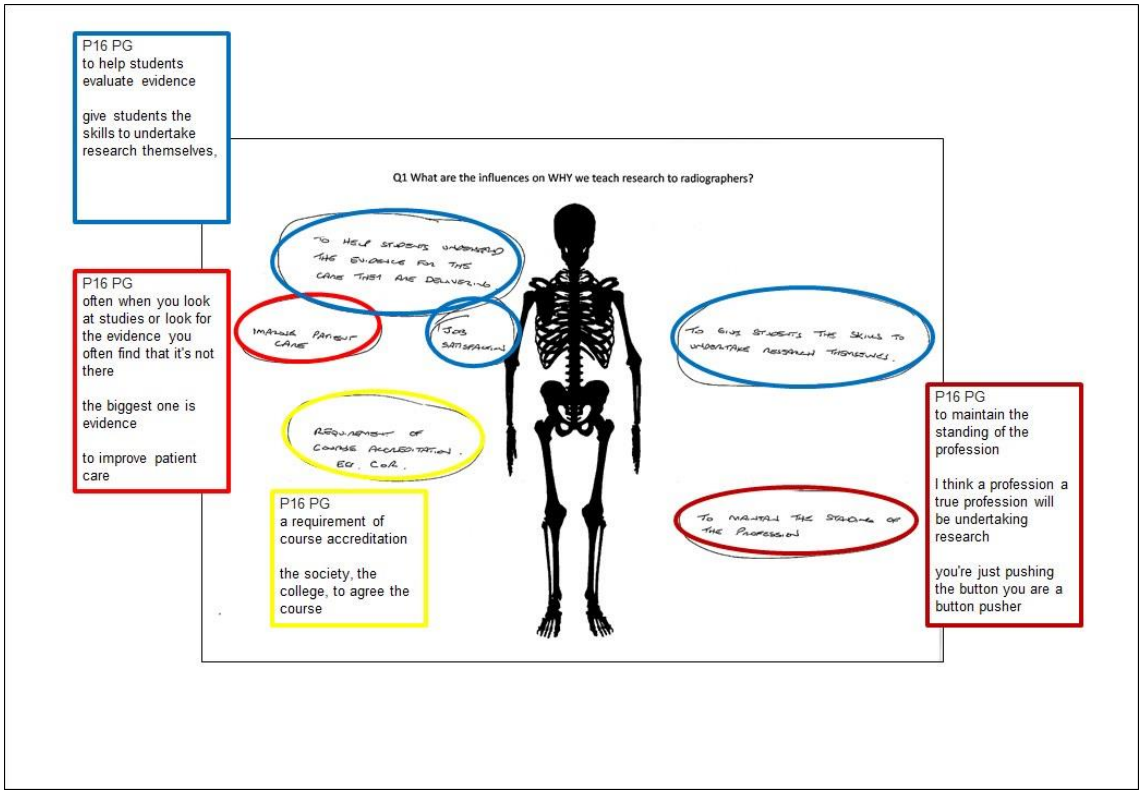
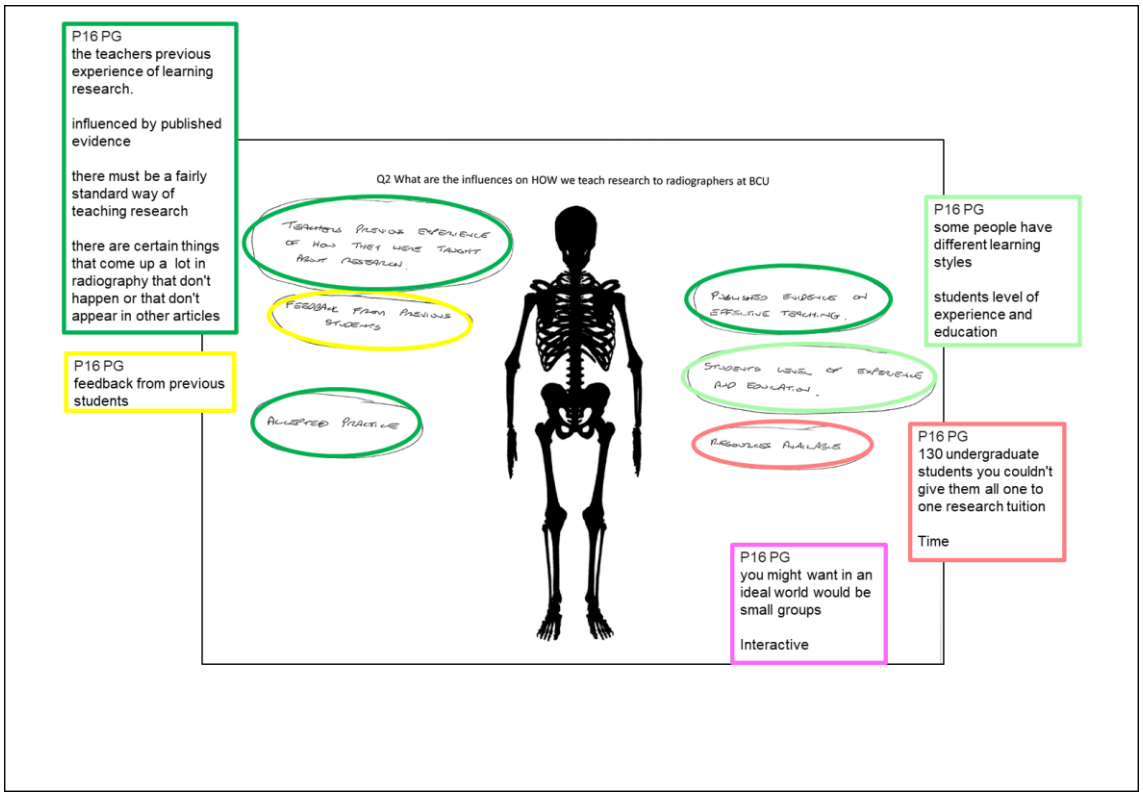
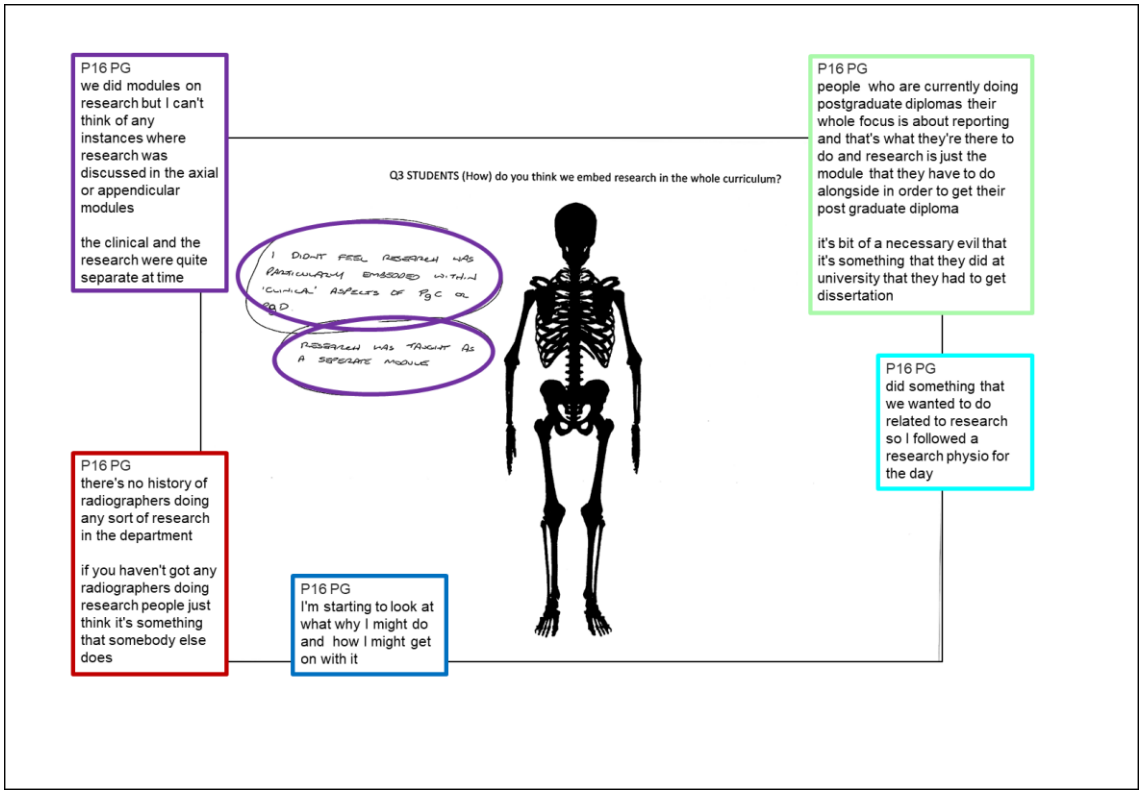
P16 Postgraduate Student







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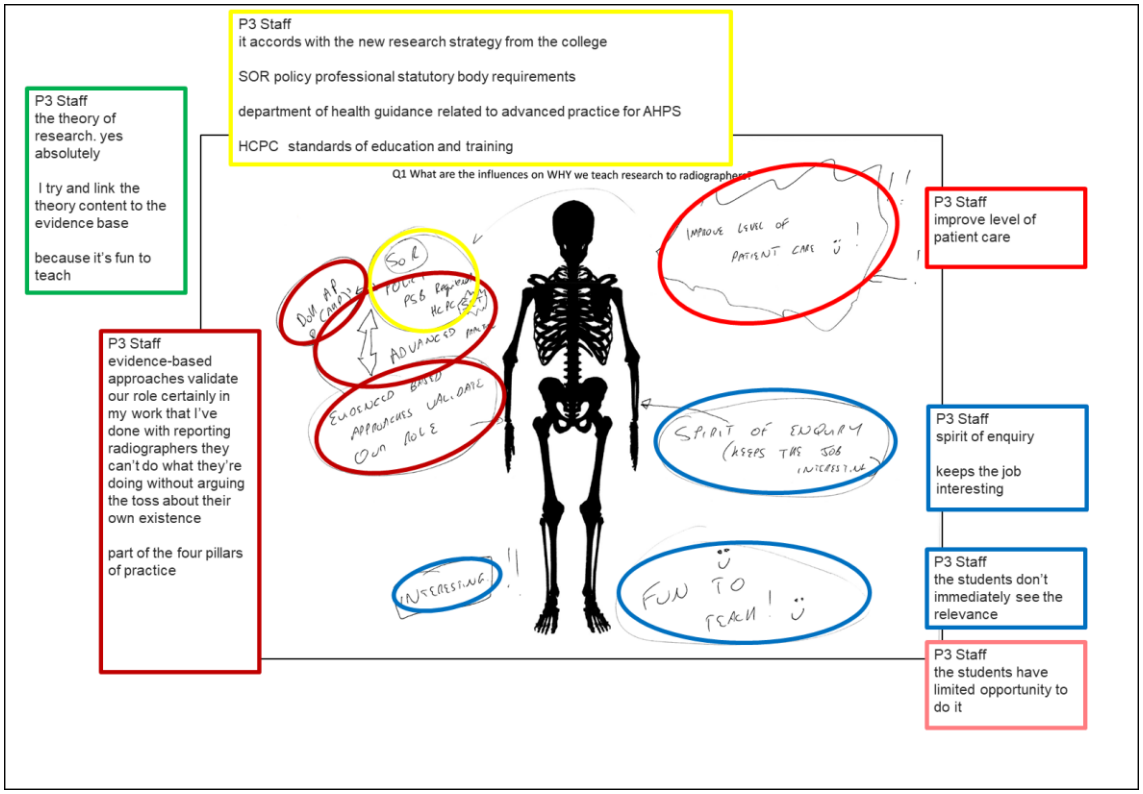
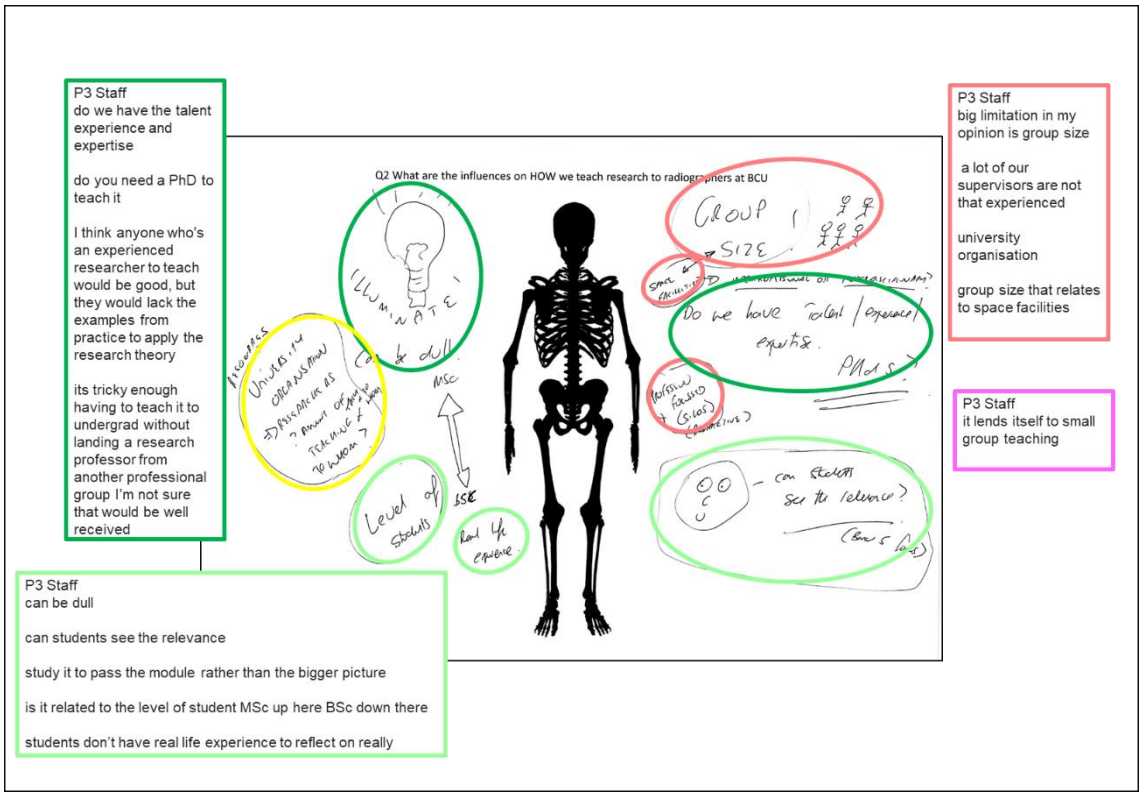
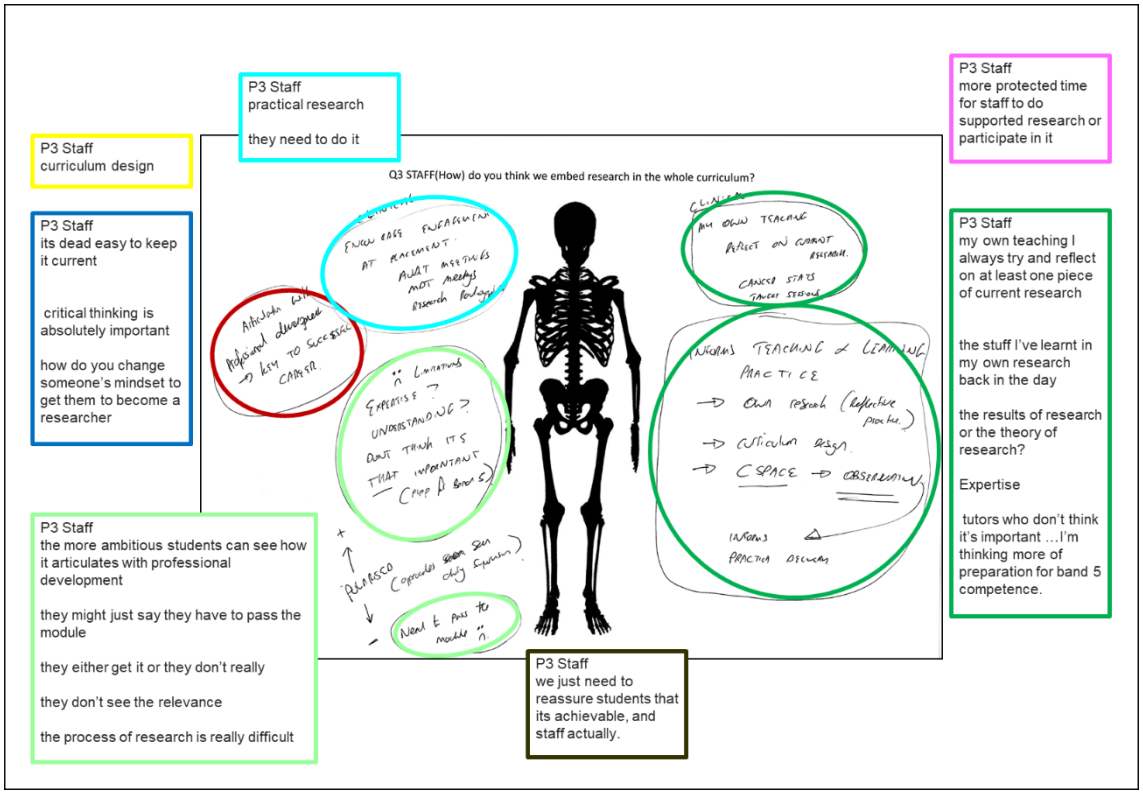
P3 Staff


P3 Staff
it accords with the new research strategy from the college
SOR policy professional statutory body requirements
department of health guidance related to advanced practice for AHPS
HCPC standards of education and training
P3 Staff
the theory of research. yes absolutely
I try and link the theory content to the evidence base
because it's fun to teach
Q1 What are the influences on WHY we teach research to radiographers?
P3 Staff
improve level of patient care
P3 Staff
evidence-based approaches validate our role certainly in my work that I've done with reporting radiographers they can't do what they're doing without arguing the toss about their own existence
part of the four pillars of practice
P3 Staff
spirit of enquiry
keeps the job interesting
P3 Staff
the students don't immediately see the relevance
P3 Staff
the students have limited opportunity to do it


P3 Staff
do we have the talent experience and expertise
do you need a PhD to teach it
I think anyone who's an experienced researcher to teach would be good, but they would lack the examples from practice to apply the research theory
its tricky enough having to teach it to undergrad without landing a research professor from another professional group I'm not sure that would be well received
P3 Staff
big limitation in my opinion is group size
a lot of our supervisors are not that experienced
university organisation
group size that relates to space facilities
Q2 What are the influences on HOW we teach research to radiographers at BCU
P3 Staff
it lends itself to small group teaching
P3 Staff
can be dull
can students see the relevance
study it to pass the module rather than the bigger picture
is it related to the level of student MSc up here BSc down there
students don't have real life experience to reflect on really



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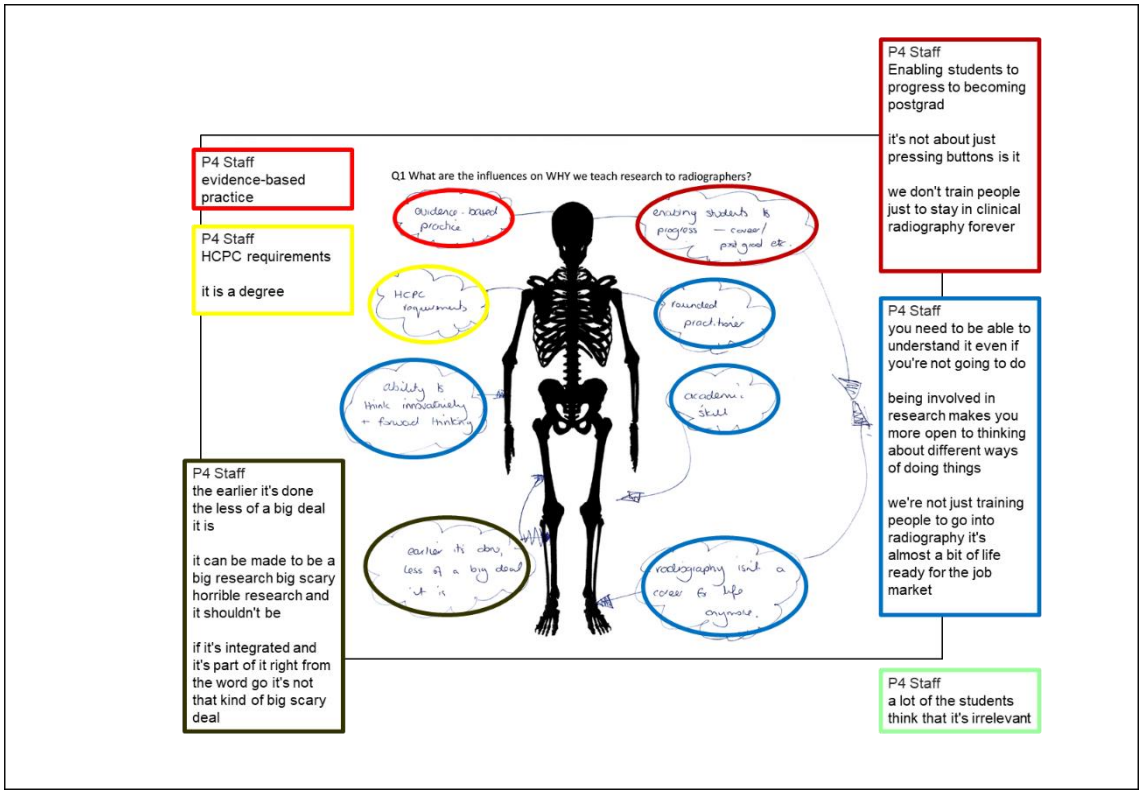
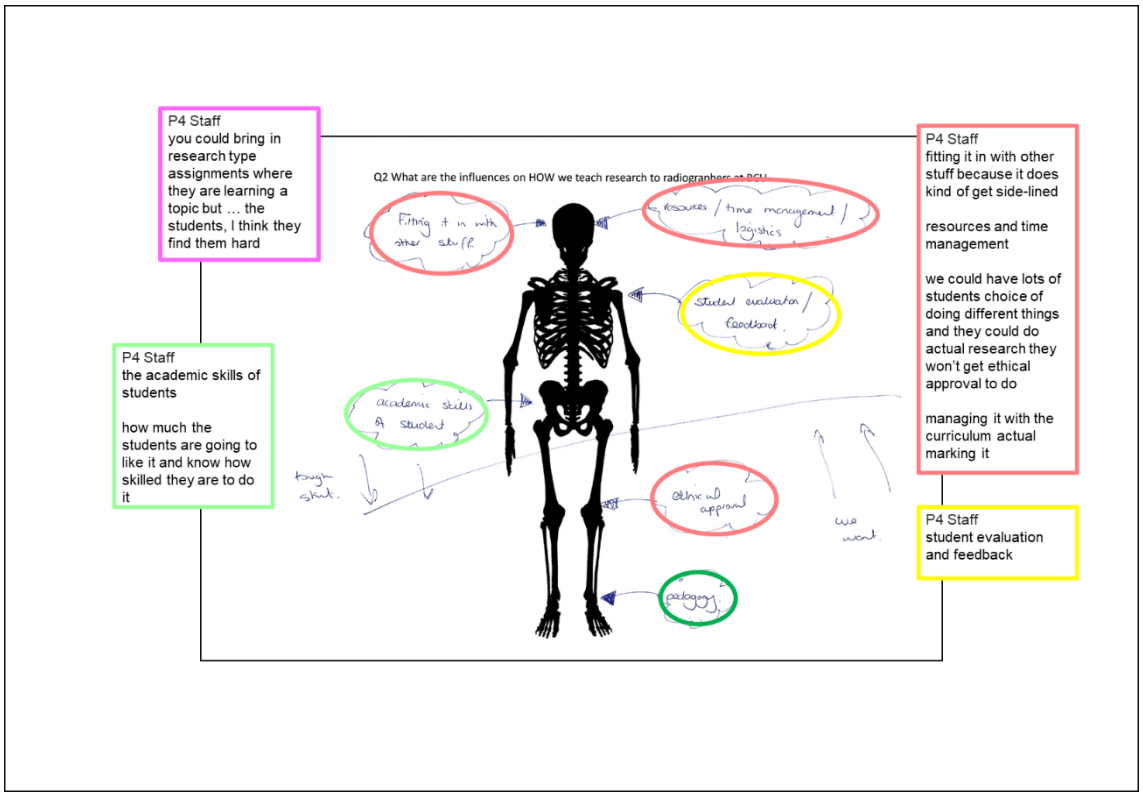
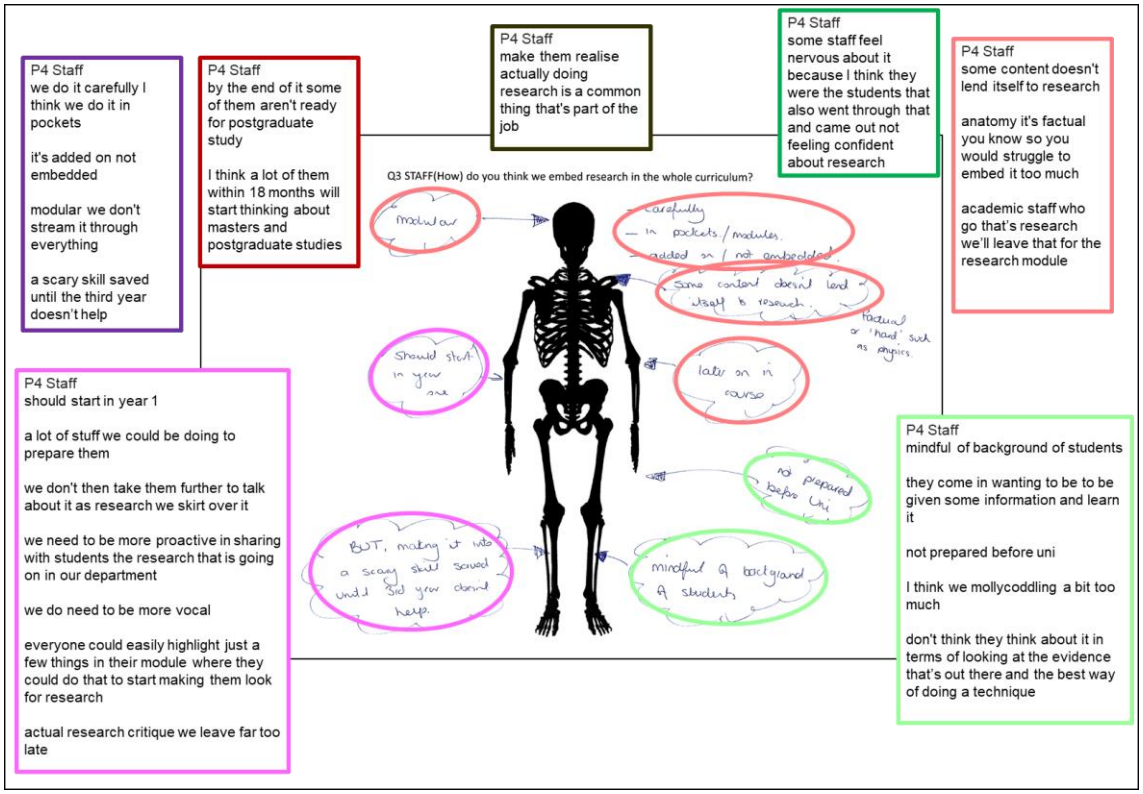
P4 Staff


Q1 What are the influences on WHY we teach research to radiographers?
evidence - based practice
existing students to progress — career/ post grad etc
HCPC requirements
founded practitioner
ability to think innovatively + forward thinking
academic skill
earlier it's done, less of a big deal it is
radiography isn't a career for life anymore.
P4 Staff
evidence-based practice
P4 Staff
HCPC requirements
it is a degree
P4 Staff
the earlier it's done the less of a big deal it is
it can be made to be a big research big scary horrible research and it shouldn't be
if it's integrated and it's part of it right from the word go it's not that kind of big scary deal
P4 Staff
Enabling students to progress to becoming postgrad
it's not about just pressing buttons is it
we don't train people just to stay in clinical radiography forever
P4 Staff
you need to be able to understand it even if you're not going to do
being involved in research makes you more open to thinking about different ways of doing things
we're not just training people to go into radiography it's almost a bit of life ready for the job market
P4 Staff
a lot of the students think that it's irrelevant


Q2 What are the influences on HOW we teach research to radiographers at BCU
Fitting it in with other stuff
resources / time management / logistics
student evaluation / feedback
academic skills of student
ethical approval
pedagogy
tough stuff
we want
P4 Staff
you could bring in research type assignments where they are learning a topic but … the students, I think they find them hard
P4 Staff
the academic skills of students
how much the students are going to like it and know how skilled they are to do it
P4 Staff
fitting it in with other stuff because it does kind of get side-lined
resources and time management
we could have lots of students choice of doing different things and they could do actual research they won't get ethical approval to do
managing it with the curriculum actual marking it
P4 Staff
student evaluation and feedback



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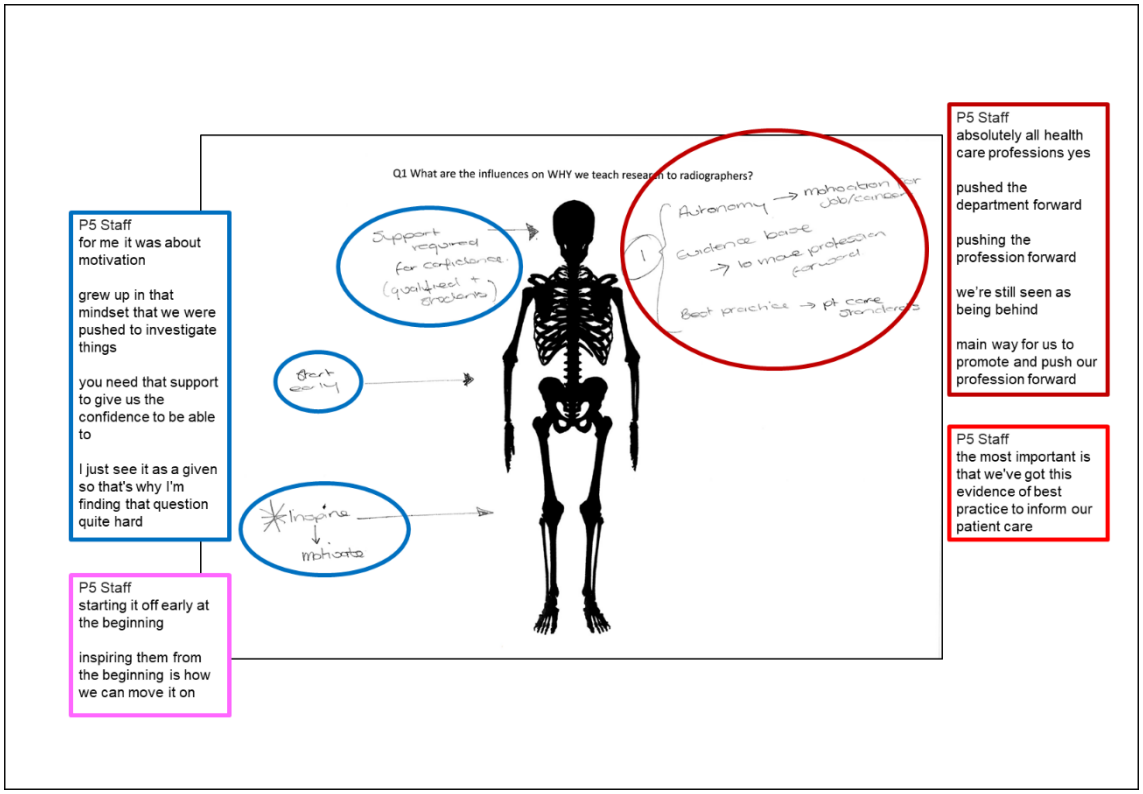
P5 Staff



P5 Staff
for me it was about motivation

grew up in that mindset that we were pushed to investigate things

you need that support to give us the confidence to be able to

I just see it as a given so that's why I'm finding that question quite hard

P5 Staff
starting it off early at the beginning

inspiring them from the beginning is how we can move it on

P5 Staff
absolutely all health care professions yes

pushed the department forward

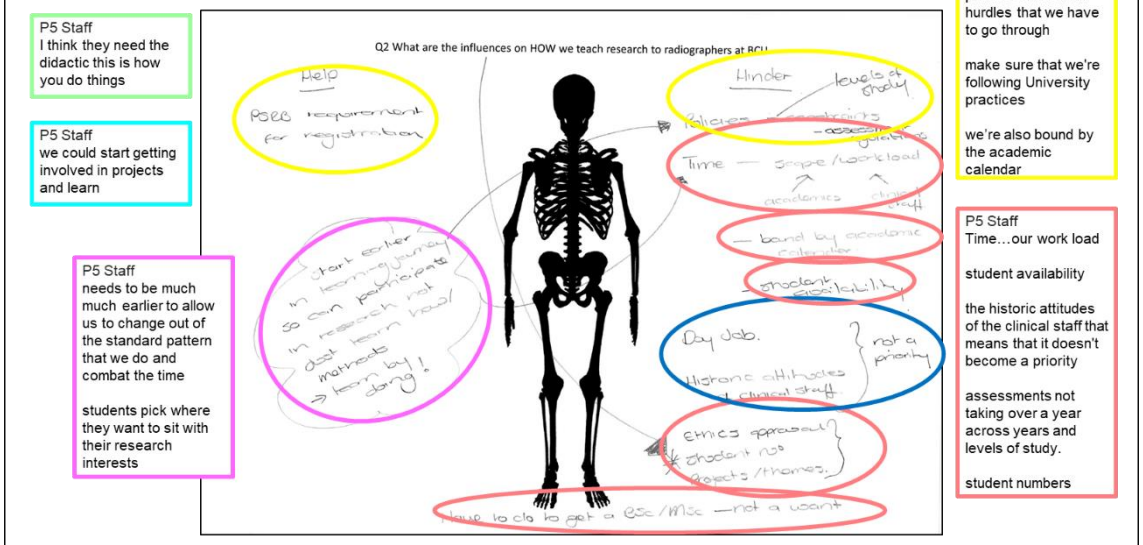
pushing the profession forward

we're still seen as being behind

main way for us to promote and push our profession forward

P5 Staff
the most important is that we've got this evidence of best practice to inform our patient care

P5 Staff
it become inherent in us from the very beginning so we're learning by doing it rather than just proving we understand how to do it



P5 Staff
I think they need the didactic this is how you do things

P5 Staff
we could start getting involved in projects and learn

P5 Staff
needs to be much much earlier to allow us to change out of the standard pattern that we do and combat the time

students pick where they want to sit with their research interests

P5 Staff
PSRB requirement for registration- the professional body

policies constraints hurdles that we have to go through

make sure that we're following University practices

we're also bound by the academic calendar

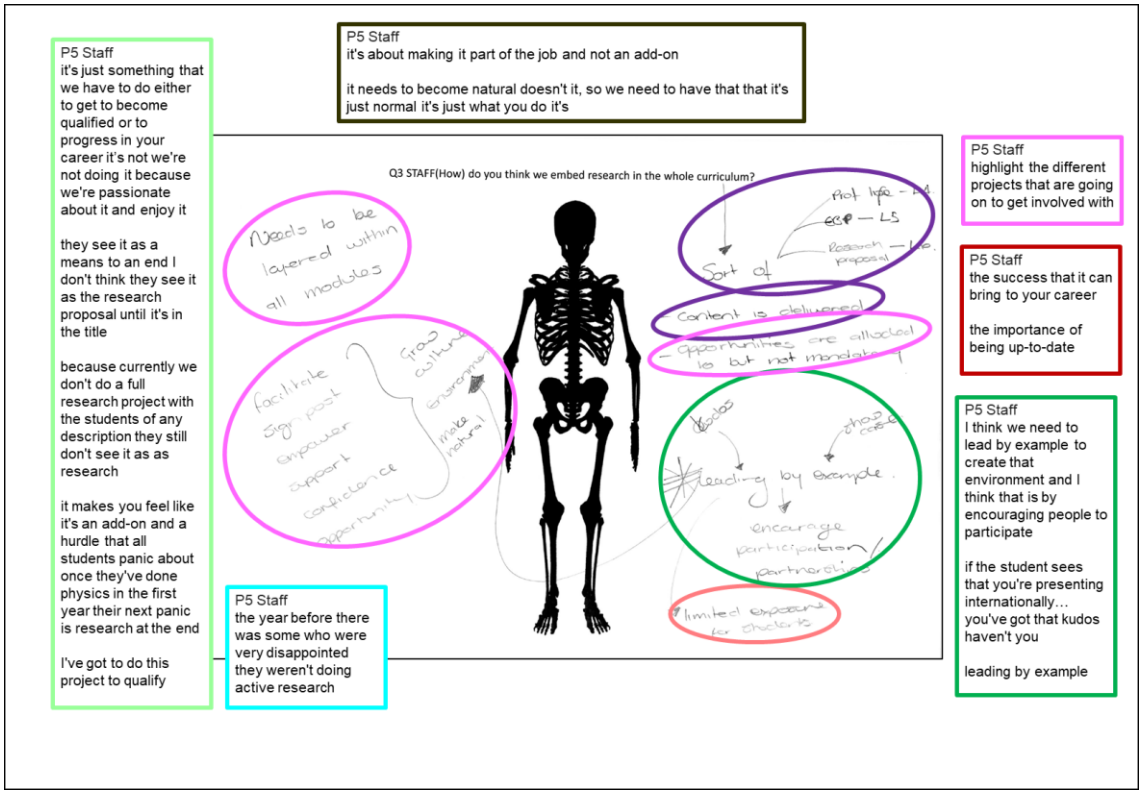
P5 Staff
Time…our work load

student availability

the historic attitudes of the clinical staff that means that it doesn't become a priority

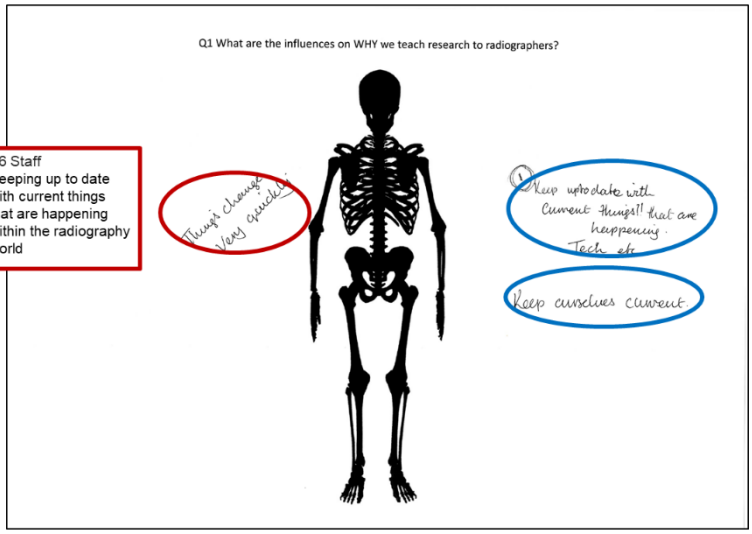
assessments not taking over a year across years and levels of study.

student numbers

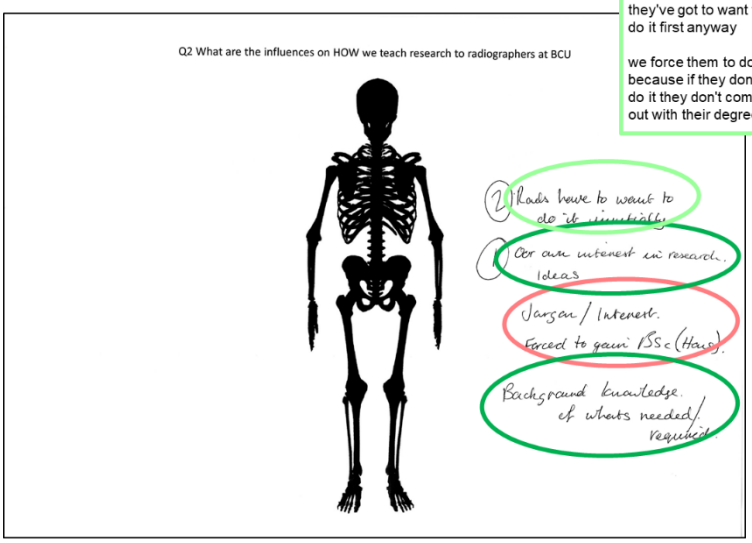


Colour Key for Co-Constructed Depiction							
Habitus- all		Hit the ground running		Influences		Normalise research	
Habitus of lecturers		Professional field- Profession oriented		Constraints		Student participation in research	
Student constraints- habitus		Professional field- patient oriented		Suggestions for improvements		Embedding research- curriculum	

P6 Staff



P6 Staff
Keeping up to date with current things that are happening within the radiography world



P6 Staff
they've got to want to do it first anyway

we force them to do it because if they don't do it they don't come out with their degree

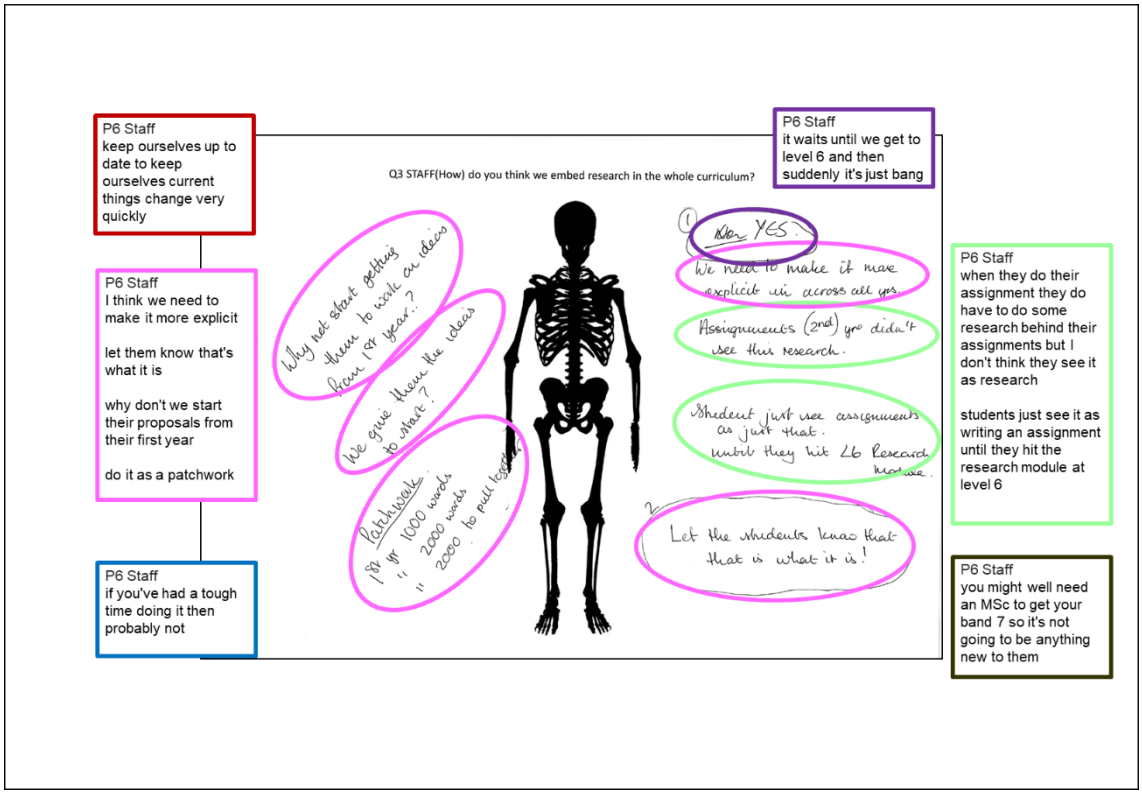
P6 Staff
there's a lot of jargon out there

P6 Staff
our own interest

having our own ideas as well which we can impart

background knowledge of what is required

if we're not interested in it it comes across that way



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P7 Staff

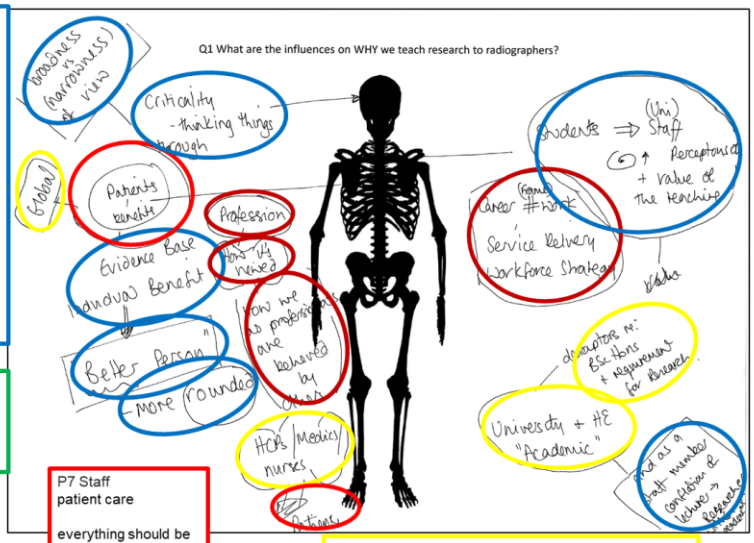
P7 Staff
criticality and thinking things through

I think about how different I am now in comparison with where I started

an awareness of the breadth of the possibilities not just your narrow defined view

to develop all of these things in the students to enable them to be good practitioners

P7 Staff
we are likely to have looked at the research that informs what we are teaching



P7 Staff
patient care

everything should be for their benefits and that's in the evidence base as well

P7 Staff
an associated link isn't there between higher education and universities and the conflated idea that that must involve research

expectation isn't there inherent within a BSC hons qualification must include research

P7 Staff
workforce development

career framework things like advanced practitioners and consultant practitioners

it's also about the professional more globally, about Who We Are What We Stand for

what other people think of us

showing that we know what we talking about

I think there is a hierarchy within professions within Healthcare services so perhaps some of that is particularly joined to the medical people that we know what we talking about

proving to the nurses that we know what we talking about

P7 Staff
it shouldn't be a Biggie

research shouldn't be a big thing should it

it's a real big deal and it shouldn't be

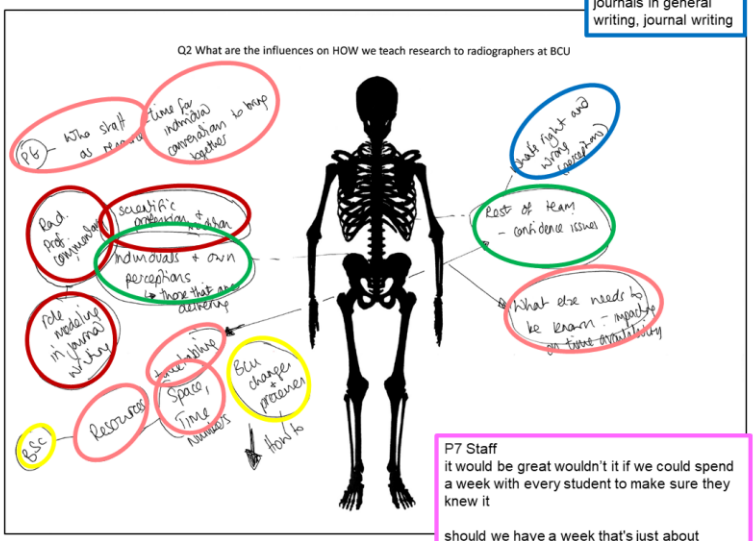
P7 Staff
each of them have bought their own agendas if you like…their own thought processes on what research is and what it should definitely look like

P7 Staff
professional influences,

that is probably heavily influenced by being from a scientific profession and tradition

sensible business making decision

BCU and changes and processes



P7 Staff
role modelling in journals in general writing, journal writing

P7 Staff
it would be great wouldn't it if we could spend a week with every student to make sure they knew it

should we have a week that's just about research

do some in the first year

bricolage

P7 Staff
confidence issues

space-time

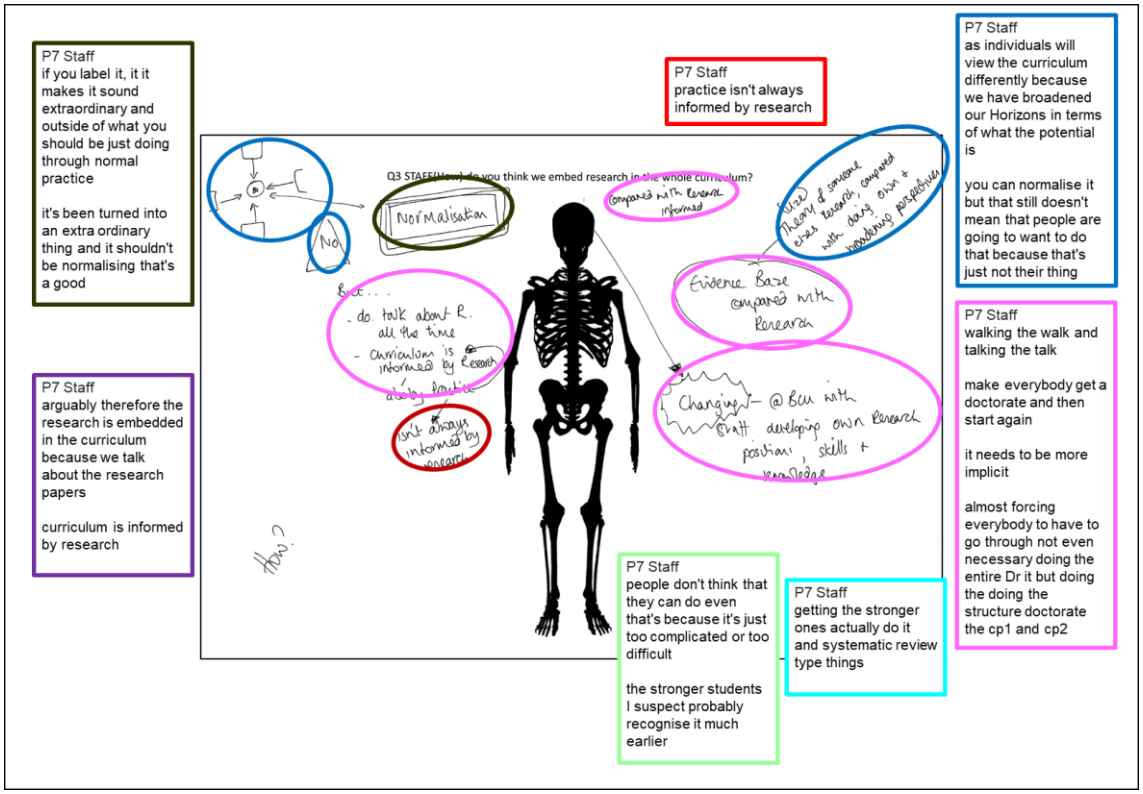
numbers then of students

we haven't got the staff because our staff who are interested in research are predominantly undergraduate we haven't got enough time to enable us to support perhaps the postgrad

an expectation that students need to be in classrooms and be taught at

Timetabling

which modules are happening at the same time



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P8 Staff

P8 Staff
from the point of view of the profession itself it's important that we don't just sit idly by and let other people conduct research and tell us what we should be thinking and what we should be doing

regulating ourselves and that regulation should come out of evidence

to be taken seriously as a profession we need to have a body of evidence behind us for everything that we do

you shouldn't be pushing a button and it's expressing radiation at people unless you know not just what you're doing but why you are doing it that way

professional responsibility to modify what is required depending on the person in front of you

so research equals professionalism

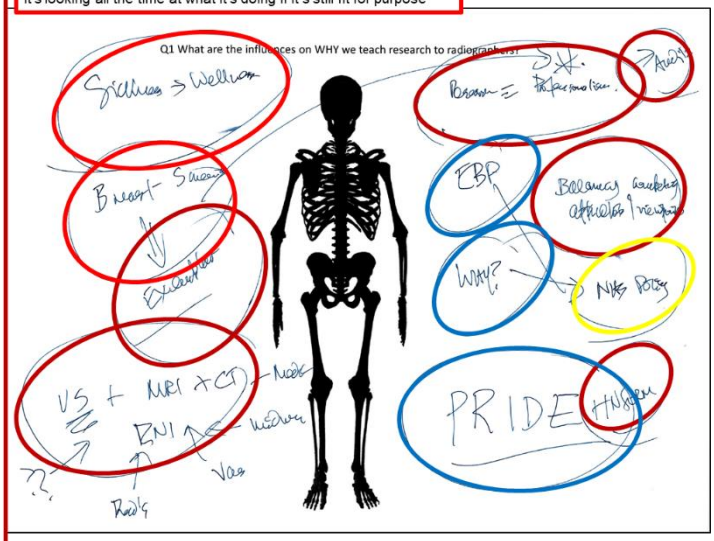
we have a duty to inform debate

in the end we will find sonography becomes its own thing and it will conduct its own research

we need to inform the public as well and other people that what we do is worthwhile

P8 Staff
we need to make quite sure that everything we do is still fit for practice

the breast screening service it constantly is conducting research it's looking all the time at what it's doing if it's still fit for purpose



P8 Staff
policies and… protocols

P8 Staff
to ask why do we do it

having pride in your profession in the way that you practice that

we need…people to do this willingly

P8 Staff
they're just ooh it's research it's the same way they regard physics in year one oh god its physics Oh God it's research

competing sort of influences and requirements

Time

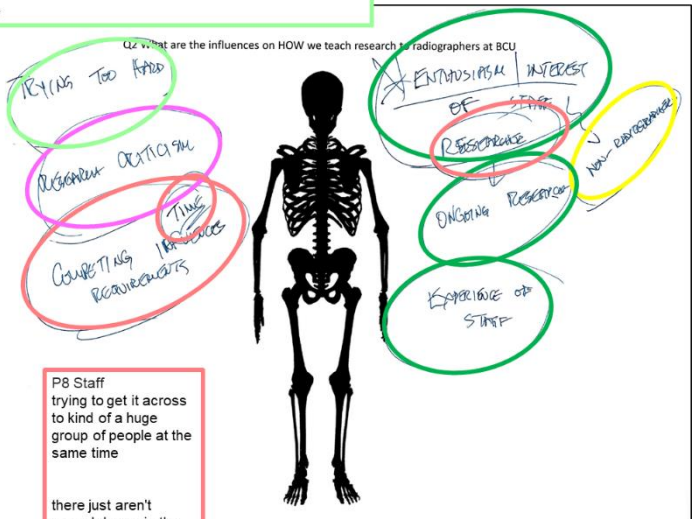
P8 Staff
we've broken that year group down into 3 smaller parts and they have been a lot more engaged

discourse and discussion is very important

do they get do you get them to ask questions in a particular way do you get them to almost do like mini research in each sort of session or do you pitch it towards the final goal

the workshop I do I find is whole lot better

they will at some point I hope do research but they should be reading it



P8 Staff
trying to get it across to kind of a huge group of people at the same time

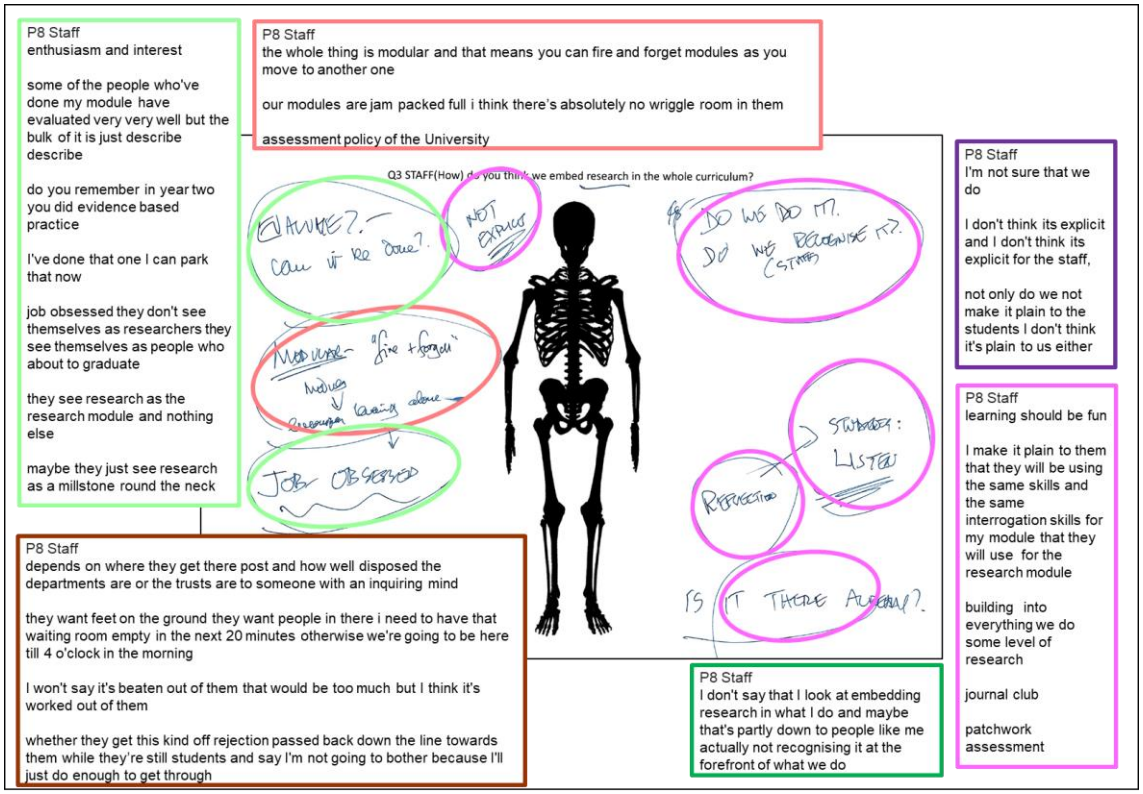
there just aren't enough hours in the day and trying to get it through ethics would be not very straight forward

P8 Staff
the enthusiasm and the interest of staff

the kind of experience of the researcher

P8 Staff
people who just lived what they did they didn't just talk about it they lived what they did

P8 Staff
if it came about that it were actually completed I think that would suit some people probably not everybody



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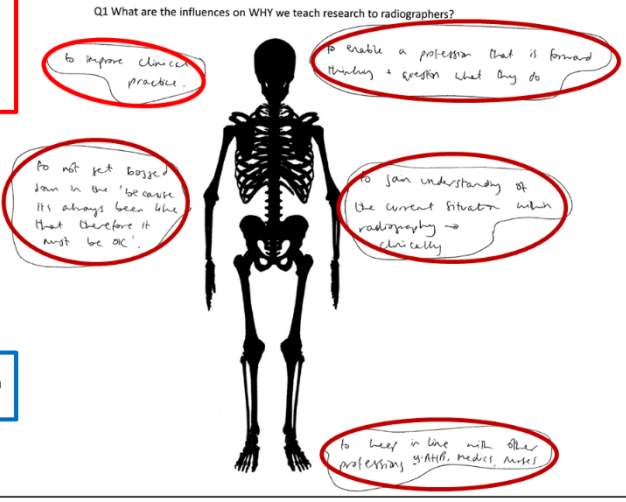
P9 Staff

P9 Staff
to improve clinical practice

to question what we do and therefore be able to do something about it



P9 Staff
to enable a profession that is forward thinking and question what they do

to gain an understanding of the current situation within radiography

to keep in line with other professions

radiographers weren't then probably someone else might fill in that gap so perhaps that might get taken over by doctors or something and then we would just be button pushes still

maintains that we are a respectable profession with thinkers not just doers

P9 Staff
we've got to question what we do

P9 Staff
design of the curriculum

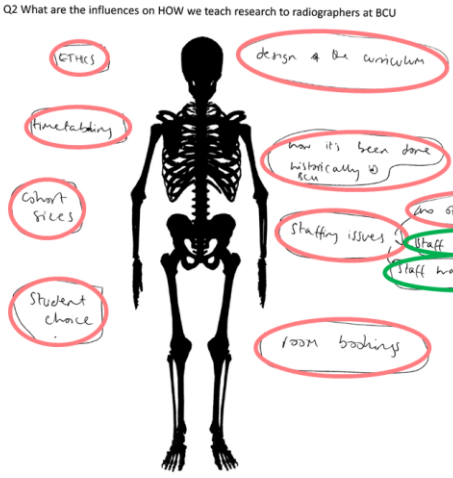
P9 Staff
ethics because that's the big issue that maybe stands in the way

the time frame of an undergraduate program

time timetabling, cohort sizes

room bookings probably

P9 Staff
the fact that it's credit bearing and everybody has to do it makes it not as interesting



P9 Staff
if you have a smaller cohort then you can have more opportunity for questions you can supervise them more efficiently

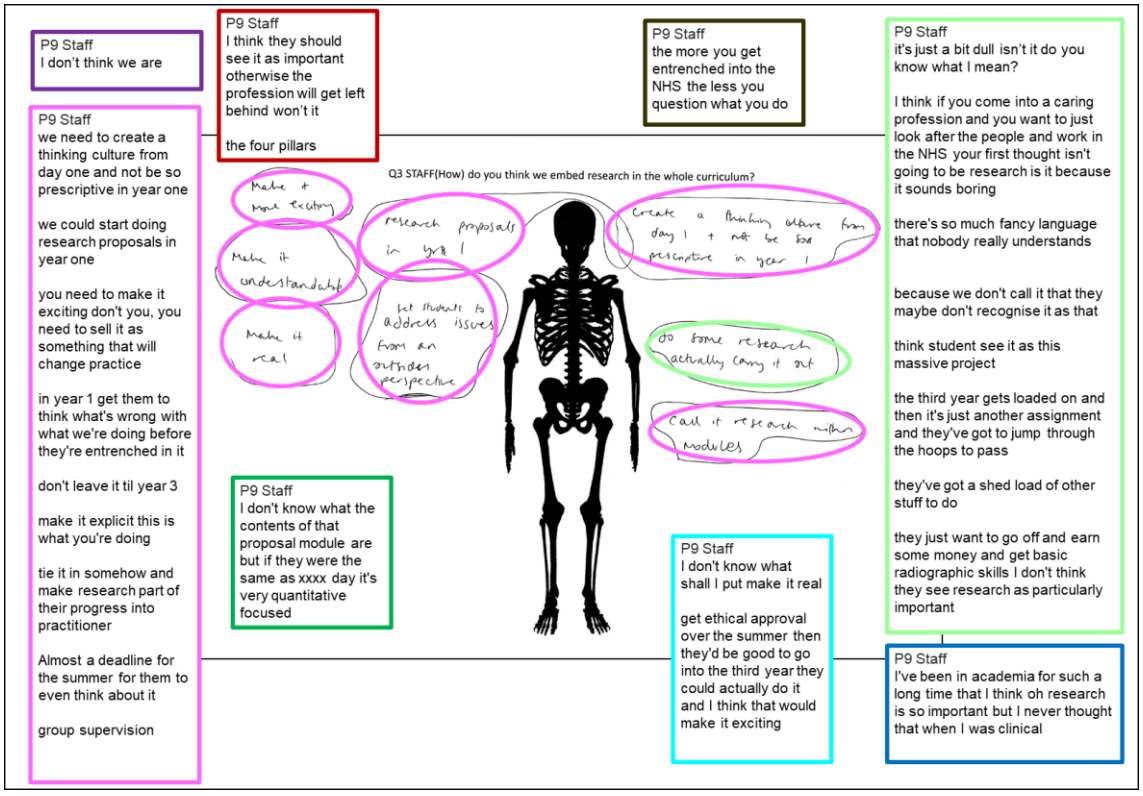
if you had a group of just 6 you could look sit and just look at it with each other for an hour then and it's perhaps more efficient than having 30 people all in one room

come up with an idea by yourself

student choice

P9 Staff
number of Staff in department just as a whole I think but also staff able to do or staff wanting to do

I would argue that if you could supervise an undergraduate research project you could probably supervise a masters project



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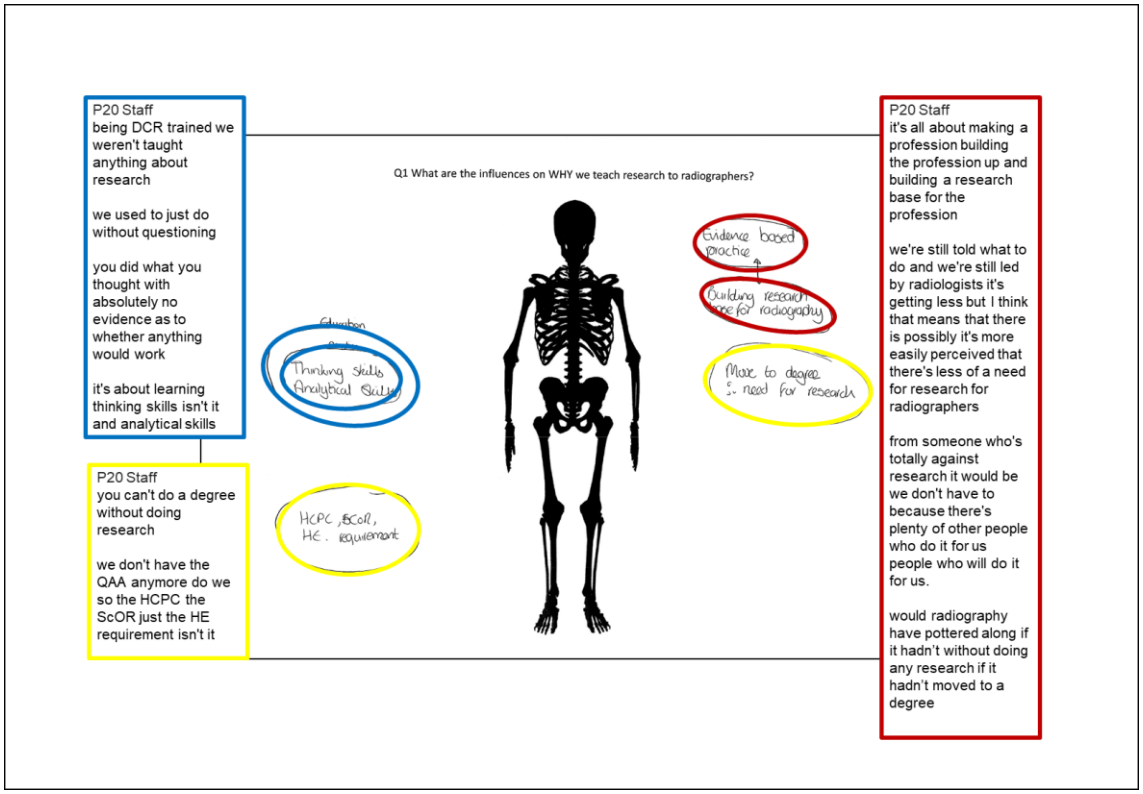
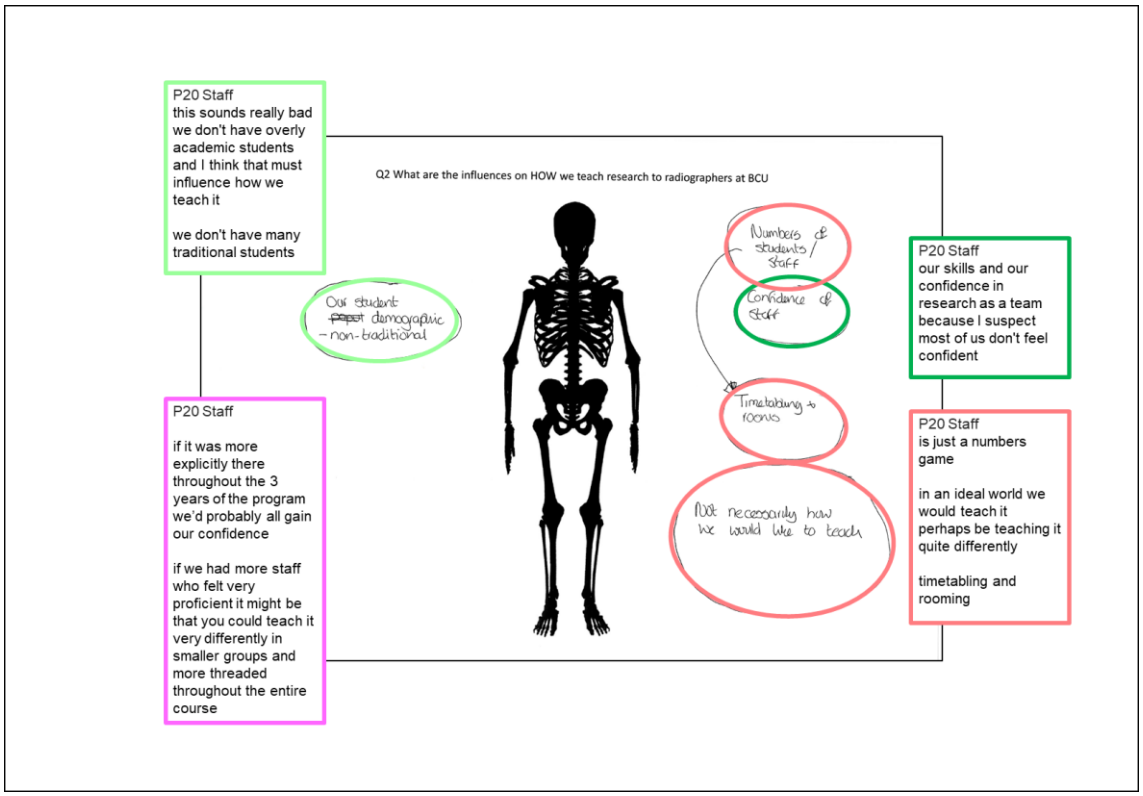
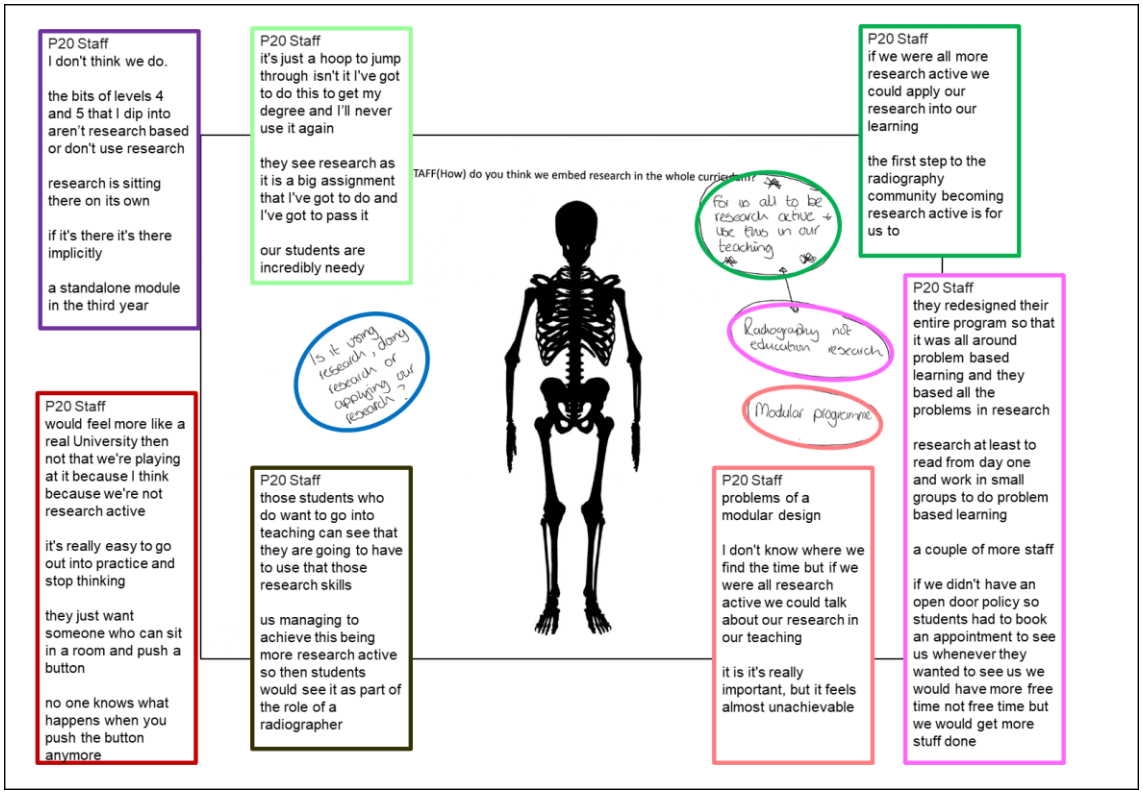
P20 Staff


Q1 What are the influences on WHY we teach research to radiographers?
P20 Staff
being DCR trained we weren't taught anything about research
we used to just do without questioning
you did what you thought with absolutely no evidence as to whether anything would work
it's about learning thinking skills isn't it and analytical skills
P20 Staff
you can't do a degree without doing research
we don't have the QAA anymore do we so the HCPC the ScOR just the HE requirement isn't it
Education
Thinking skills
Analytical skills
HCPC, ScOR, HE requirement
evidence based practice
Building research capacity for radiography
More to degree ∴ need for research
P20 Staff
it's all about making a profession building the profession up and building a research base for the profession
we're still told what to do and we're still led by radiologists it's getting less but I think that means that there is possibly it's more easily perceived that there's less of a need for research for radiographers
from someone who's totally against research it would be we don't have to because there's plenty of other people who do it for us people who will do it for us.
would radiography have pottered along if it hadn't without doing any research if it hadn't moved to a degree


Q2 What are the influences on HOW we teach research to radiographers at BCU
P20 Staff
this sounds really bad we don't have overly academic students and I think that must influence how we teach it
we don't have many traditional students
P20 Staff
if it was more explicitly there throughout the 3 years of the program we'd probably all gain our confidence
if we had more staff who felt very proficient it might be that you could teach it very differently in smaller groups and more threaded throughout the entire course
Our student ~~popot~~ demographic - non-traditional
Numbers of students / staff
Confidence of staff
Timetabling & rooms
Not necessarily how we would like to teach
P20 Staff
our skills and our confidence in research as a team because I suspect most of us don't feel confident
P20 Staff
is just a numbers game
in an ideal world we would teach it perhaps be teaching it quite differently
timetabling and rooming



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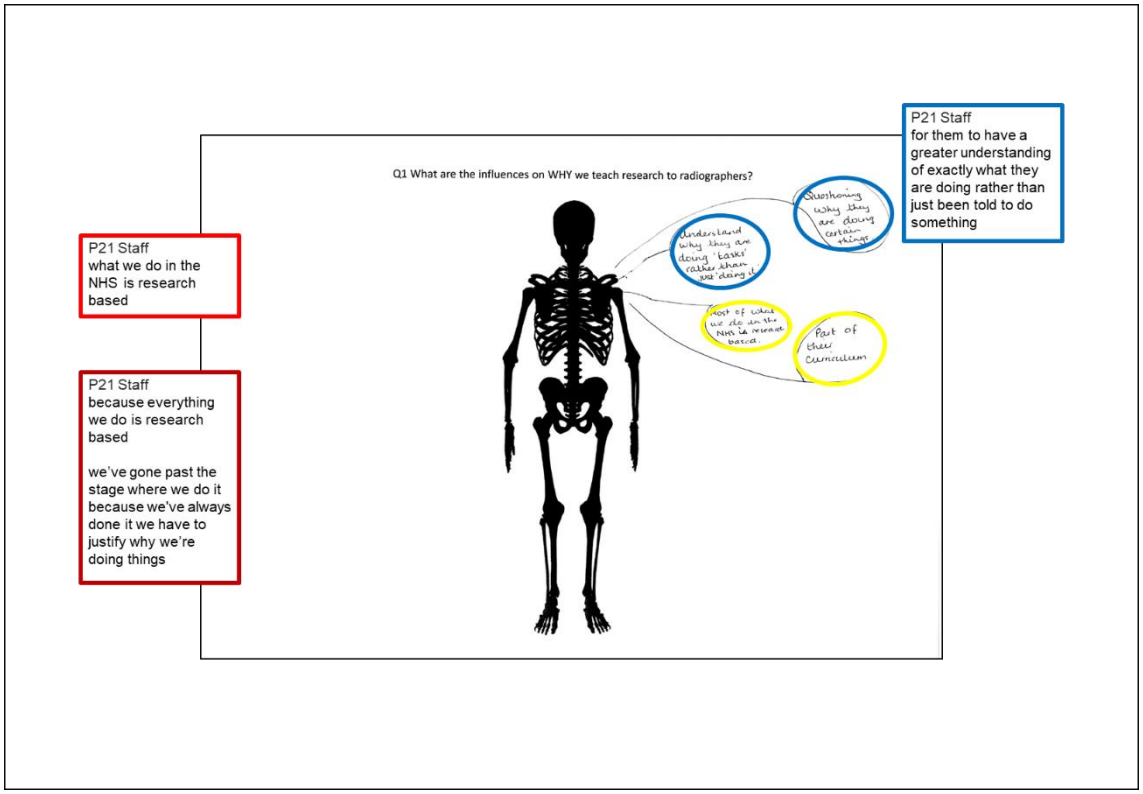
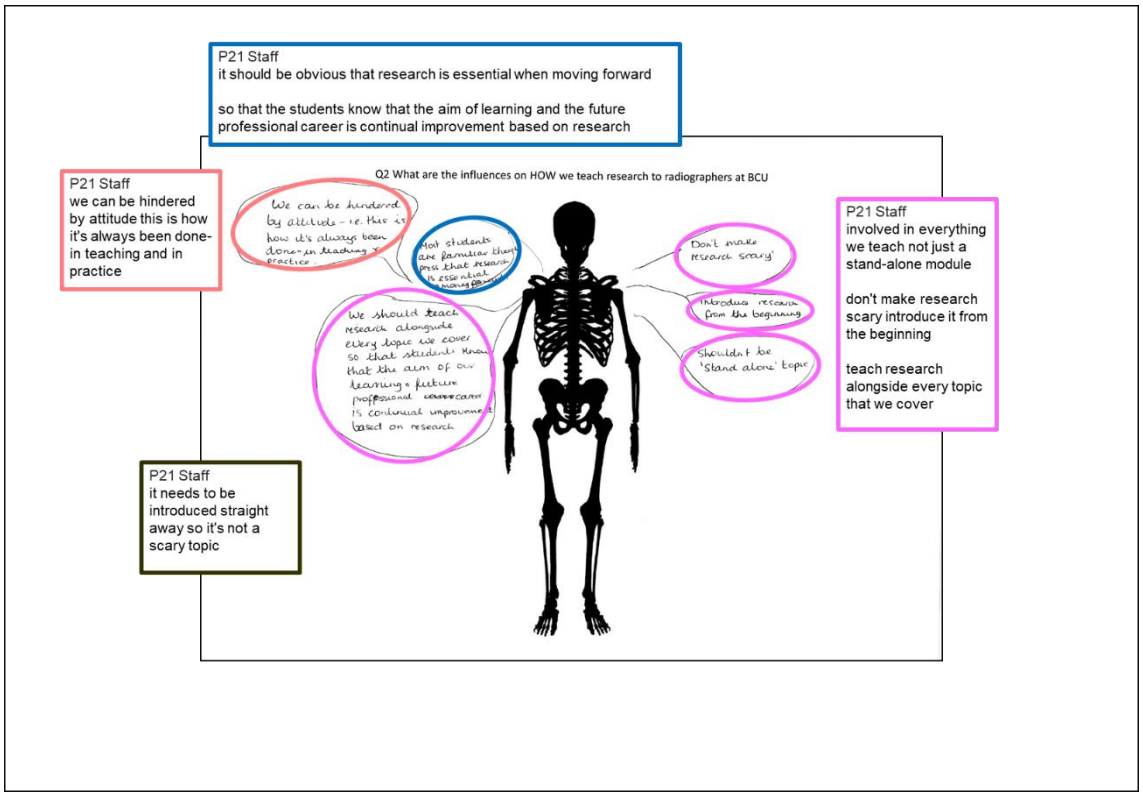
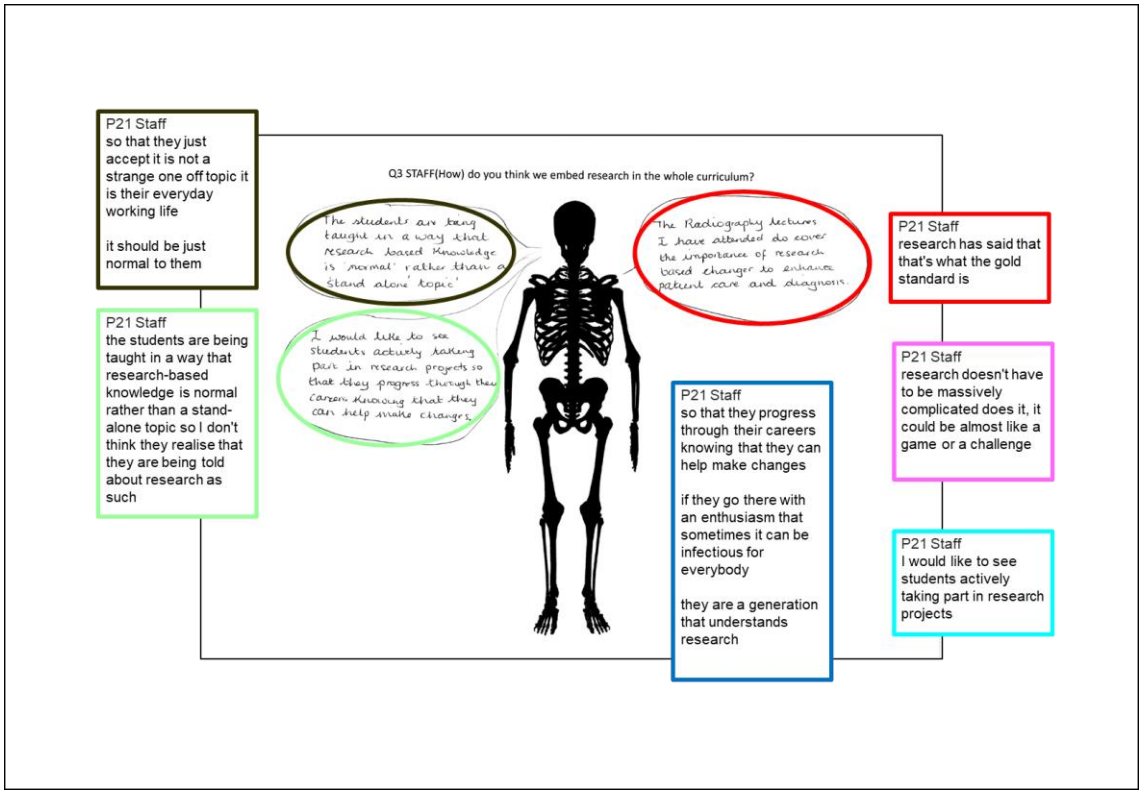
P21 Staff


Q1 What are the influences on WHY we teach research to radiographers?
Questioning why they are doing certain things
Understand why they are doing 'tasks' rather than just doing it
Most of what we do in the NHS is research based
Part of their curriculum
P21 Staff
what we do in the NHS is research based
P21 Staff
because everything we do is research based
we've gone past the stage where we do it because we've always done it we have to justify why we're doing things
P21 Staff
for them to have a greater understanding of exactly what they are doing rather than just been told to do something


P21 Staff
it should be obvious that research is essential when moving forward
so that the students know that the aim of learning and the future professional career is continual improvement based on research
Q2 What are the influences on HOW we teach research to radiographers at BCU
We can be hindered by attitudes - ie. this is how it's always been done in teaching & practice
Most students are familiar with pres that research is essential when moving forward
We should teach research alongside every topic we cover so that students know that the aim of our learning & future professional career is continual improvement based on research
Don't make research scary'
Introduce research from the beginning
Shouldn't be 'Stand alone' topic
P21 Staff
we can be hindered by attitude this is how it's always been done- in teaching and in practice
P21 Staff
it needs to be introduced straight away so it's not a scary topic
P21 Staff
involved in everything we teach not just a stand-alone module
don't make research scary introduce it from the beginning
teach research alongside every topic that we cover



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Appendix G. **Ethics Committee Approval Letter**

REDACTED

United Kingdom

Dear Louise ,

Re: McKnight /Sep /2017 /RLRA /1366 - Exploring and Understanding the Positionality of Research and its Pedagogy in the UK Radiography Profession

Thank you for your application and documentation regarding the above activity. I am pleased to take Chair's Action and approve the activity which means you may begin.

On reviewing your application it was noted that on the consent form there is no date indicating when it was signed and you may wish to include this. It is not necessary to see the form again.

I can also confirm that any person participating in the project is covered under the University's insurance arrangements.

Please note that ethics approval only covers your activity as it has been detailed in your ethics application. If you wish to make any changes to the activity, then you must submit an Amendment application for approval of the proposed changes.

Examples of changes include (but are not limited to) adding a new study site, a new method of participant recruitment, adding a new method of data collection and/or change of Project Lead.

Please also note that the Committee should be notified of any serious adverse effects arising as a result of this activity.

If for any reason the Committee feels that the activity is no longer ethically sound, it reserves the right to withdraw its approval. In the unlikely event of issues arising which would lead to this, you will be consulted.

If you have any queries, please contact REDACTED

I wish you every success with your activity.

Yours Sincerely,

REDACTED

Page 1 of 1

Appendix H. **Permission of access to participants letter**

Hello

As part of my Professional Doctorate in Education (EdD) I am undertaking a research project called:

'Exploring and Understanding the Positionality of Research and its Pedagogy in the UK Radiography Profession'.

For this study I am intending to ask members of the academic team and students at BSc and Postgraduate levels in the Department of Radiography at REDACTED to consent to being interviewed as part of my data collection.

In order to apply for ethics approval for this pilot, I would like to ask you for 'Permission of Access' to the academic staff and students in the Department of Radiography at REDACTED to allow me to approach potential participants, by email, and then interview them. To comply with the REDACTED ethics application, and if you are in agreement, please could you send me a confirmatory email with your contact details to say that access is acceptable.

If you would like any further information please let me know.

Appendix I. **NHS REC Approval Result**

Go straight to content.

MRC Medical Research Council

NHS Health Research Authority

Do I need NHS REC approval?

To print your result with title and IRAS Project ID please enter your details below:

Title of your research:

Perceptions of Research Pedagogy in the Radiography Curriculu

IRAS Project ID (if available):

Your answers to the following questions indicate that **you do not need NHS REC approval for sites in England.** However, **you may need other approvals.**

You have answered ***'YES'*** to: Is your study research?

You answered ***'NO'*** to all of these questions:

Question Set 1

- Is your study a clinical trial of an investigational medicinal product?
- Is your study one or more of the following: A non-CE marked medical device, or a device which has been modified or is being used outside of its CE mark intended purpose, and the study is conducted by or with the support of the manufacturer or another commercial company (including university spin-out company) to provide data for CE marking purposes?
- Does your study involve exposure to any ionising radiation?
- Does your study involve the processing of disclosable protected information on the Register of the Human Fertilisation and Embryology Authority by researchers, without consent?
- Is your study a clinical trial involving the participation of practising midwives?

Question Set 2

- Will your study involve research participants identified from, or because of their past or present use of services (adult and children's healthcare within the NHS and adult social care), for which the UK health departments are responsible (including services provided under contract with the private or voluntary sectors), including participants recruited through these services as healthy controls?

- Will your research involve collection of tissue or information from any users of these services (adult and children's healthcare within the NHS and adult social care)? This may include users who have died within the last 100 years.
- Will your research involve the use of previously collected tissue or information from which the research team could identify individual past or present users of these services (adult and children's healthcare within the NHS and adult social care), either directly from that tissue or information, or from its combination with other tissue or information likely to come into their possession?
- Will your research involve research participants identified because of their status as relatives or carers of past or present users of these services (adult and children's healthcare within the NHS and adult social care)?

Question Set 3

- Will your research involve the storage of relevant material from the living or deceased on premises in the UK, but not Scotland, without an appropriate licence from the Human Tissue Authority (HTA)? This includes storage of imported material.
- Will your research involve storage or use of relevant material from the living, collected on or after 1st September 2006, and the research is not within the terms of consent from the donors, and the research does not come under another NHS REC approval?
- Will your research involve the analysis of DNA from bodily material, collected on or after 1st September 2006, and this analysis is not within the terms of consent for research from the donor?

Question Set 4

- Will your research involve at any stage intrusive procedures with adults who lack capacity to consent for themselves, including participants retained in study following the loss of capacity?
- Is your research health-related and involving prisoners?
- Does your research involve xenotransplantation?
- Is your research a social care project funded by the Department of Health?

If your research extends beyond **England** find out if you need NHS REC approval by selecting the *'OTHER UK COUNTRIES'* button below.

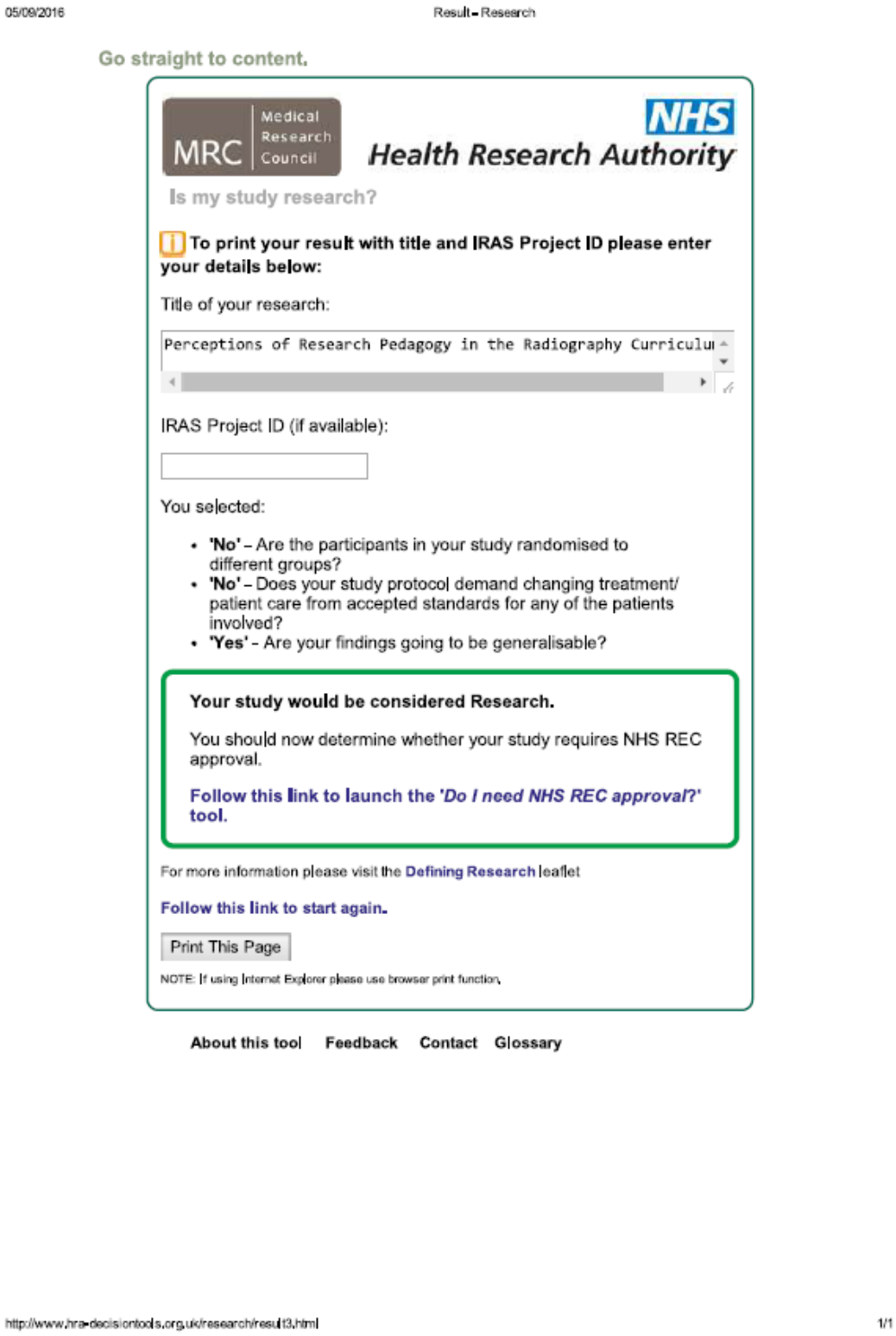
OTHER UK COUNTRIES

If, after visiting all relevant UK countries, this decision tool suggests that you do not require NHS REC approval follow this link for final confirmation and further information.

Print This Page

NOTE: If using Internet Explorer please use browser print function.

Appendix J. **MRC (Medical Research Council) NHS Health Research Authority**



05/09/2016 Result - Research

Go straight to content.

MRC Medical Research Council

NHS Health Research Authority

Is my study research?

To print your result with title and IRAS Project ID please enter your details below:

Title of your research:

Perceptions of Research Pedagogy in the Radiography Curriculu

IRAS Project ID (if available):

You selected:

- **'No'** – Are the participants in your study randomised to different groups?
- **'No'** – Does your study protocol demand changing treatment/ patient care from accepted standards for any of the patients involved?
- **'Yes'** – Are your findings going to be generalisable?

Your study would be considered Research.

You should now determine whether your study requires NHS REC approval.

Follow this link to launch the *'Do I need NHS REC approval?'* tool.

For more information please visit the **Defining Research** leaflet

Follow this link to start again.

Print This Page

NOTE: If using Internet Explorer please use browser print function.

About this tool **Feedback** **Contact** **Glossary**

http://www.hra-decisiontools.org.uk/research/result3.html 1/1