A two-phase study to explore whether student radiographer attrition can be predicted and to improve understanding of high attrition rates from undergraduate diagnostic radiography degrees in England.

Submitted by Susan McAnulla, to the University of Exeter as a dissertation for the degree of Masters by Research in Medical Imaging, December 2018

Abstract

Background:

Little research has been undertaken into the high rates of attrition from Diagnostic Radiography programmes. This two-phase study explored risk factors and experiences that may lead to attrition along with strategies that have enabled students to overcome these and continue their studies.

Methods:

Phase one – Quantitative, retrospective analysis of data from 2009-2014 for 579 past undergraduate student diagnostic radiographers from three English universities using non-parametric statistical tests and logistic regression. Data analysed included demographic and educational characteristics.

Phase two - Qualitative national online survey of 168 current undergraduate student diagnostic radiographers to further explore findings from phase one.

Results:

From the retrospective data, an attrition rate of 19% was reported with 45% non-completers leaving for personal reasons. Peak attrition was at 12 months. Increased age, non A-level entry qualifications and poor academic performance were identified as risk factors for attrition ($p<0.005$).

From the survey data, a response rate of 5% was achieved. The majority of students who had considered leaving reported multiple reasons. Results suggested that for mature students, external pressures were likely to be the greatest cause of attrition; for younger students, academic difficulty and workload. Poor academic performance may result from both of these situations. Entry qualification was not identified by students as an issue and was not likely to be the cause of increased attrition for students holding these; the majority of these students were mature and many of the complex difficulties reported related to this rather than other problems. However, several of the younger students holding these qualifications reported academic struggling which may require consideration. Appropriate support was identified by students as key in their decisions to continue.

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List of abbreviations

BTEC	Business and Technology Education Council
CoR	College of Radiographers
CT	Computed Tomography
DH	Department of Health
FSM	Free school meals
FtP	Fitness to Practise
GPA	Grade point average
HE	Higher education
HEE	Health Education England
HEI	Higher Education Institution
NHS	National Health Service
NNCO	National Networks for Collaborative Outreach
OFFA	Office for Fair Access
POLAR	Participation of local area
SES	Socio-economic status
SCoR	Society and College of Radiographers
SoR	Society of Radiographers
UCAS	University and Colleges Admission Service
UK	United Kingdom
WP	Widening Participation

Chapter 1: Background and Introduction

1.1 Introduction to project

This project was conducted between 2014 and 2018. In the academic year 2013-14, in the United Kingdom (UK), 2,625 student radiographers commenced their professional education and training. Of these, 1,890 were diagnostic radiography students, 625 were therapeutic radiography students and a further 110 were classified as radiology [1] therefore were unable to be identified as diagnostic or therapeutic (however the Joint Academic Coding System (JACS) code is confirmed by The Higher Education Statistics Agency (HESA) as being radiography rather than the medical field of radiology which the name might suggest). Student retention (and therefore attrition) is measured in two ways; students who complete their degrees (completion) and students who re-enrol the following year (continuation).[2] For the purpose of this study, the completion (or non-completion) rate is the metric considered.

Rates of attrition (non-completion) amongst UK diagnostic student radiographers reached 36.6% in 2009.[3] More current figures suggest that this has fallen to 14% but could be as high as 44% for some programmes.[4] The rate still remains above the average of 8% for higher education.[5] This study seeks to explore these high attrition rates in an attempt to identify any predictors of non-completion that may guide the provision of support to reduce attrition. It has been acknowledged that it is difficult to predict attrition on the basis of entry characteristics alone [6] but it is anticipated that this project will be beneficial in adding to the evidence base on this subject.

1.2 An insight into the radiographic workforce and the impact of student radiographer attrition

There are approximately 34,000 diagnostic and therapeutic radiographers registered in the UK [7] with around 80% of those being diagnostic radiographers.[8] The majority of employment will be in the National Health Service (NHS) as most medical imaging occurs in NHS hospitals. 14,654 full time equivalent (FTE) diagnostic radiographers are recorded in the 2018 NHS workforce statistics [8] compared to 15,954 in 2014.[9] This figure is at odds with the number of registered radiographers which may suggest that there are a substantial number of registered radiographers either not currently practicing, practicing part-time or practicing outside the NHS e.g. in the private sector or education. These figures suggest that the number of radiographers working in the NHS is falling at the same time as demand for imaging services is increasing [10] which increases pressure on service delivery and staff and makes it essential to retain and train sufficient diagnostic radiographers to maintain the required workforce. There is a national shortage of both diagnostic and therapeutic radiographers resulting in them being listed on the government approved Tier 2 Shortage Occupation list.[11]

1.3 Background to project

Over the past decade, although reported attrition rates from diagnostic radiography programmes have fallen from 36% to 14% [4, 12] further reduction is required in order to maintain the diagnostic radiography workforce. In 2006, it was recommended that attrition rates during pre-registration training should not exceed 10% [3] and it is clear that current figures still exceed this target. These figures were significantly higher than those for nursing, for which figures of 26.3% are quoted for 2006 but the attrition rate from nursing remains similar whereas diagnostic radiography attrition has reduced. [13, 14] For physiotherapy, attrition rates of between 6% and 10% have been suggested and occupational therapy 7-12%.[15] These figures for Allied Health Professions (AHPs) predate the figures for nursing and diagnostic radiography but are the most current identified. A ten year

retrospective study published in 2013 claimed average attrition rates from medical schools as 11.1%.[16]

The majority of attrition for nursing students occurred during or just after clinical placements with a number of factors such as long commutes, a mismatch between expectation and reality, isolation and stress contributing.[17] It is recognised that student withdrawal from nursing has implications for future workforce supply [18] and the situation will be echoed for radiography. This leaves the workforce in a vulnerable position whereby it is likely that there would be fewer new graduates that there were positions to be filled. Current estimates are that approximately 10% radiographer posts are vacant. [19]

At the time this study was commenced, radiography education was commissioned and funded by Health Education England (HEE) at a national benchmark cost of £10,814 per student per annum for direct educational costs [20] and in addition to this, hospitals received a non-medical education tariff (NMET) of £3,175 per full-time equivalent clinical placement [21] bringing the total basic cost close to £14,000 per student per year. Even with a conservative assumption that all students leaving their programmes before the end complete only one year, this could equate to over £13.4 million of public money having been lost annually due to student radiographer attrition. During the project, following the government's comprehensive spending review in 2017, the funding model changed from NHS support to student loan support thus transferring the cost of attrition directly to the students. NMET remained payable by HEE.

Radiographers are in high demand and the UK qualification is widely recognised internationally [22]; working abroad may be a tempting prospect for some and may contribute further to the overall shortage. That said, radiographers who have qualified in some countries other than the UK may be eligible for registration with the Health and Care Professions Council (HCPC) thus enabling them to work in the UK however it also noted that reciprocity is not assured.[22]

These student attrition rates together with the existing workforce shortage creates a challenge for radiography educators; to increase the number of radiographers

entering the workforce, they may consider increasing the number of students enrolling to train as diagnostic radiographers (but places are likely to be limited due to non-academic factors such as clinical placement availability) and ensure as many as possible go on to qualify without compromising on academic, clinical or professional standards.[23] All radiography programmes in the UK must be approved by the HCPC as being fit for purpose [24] in order that graduates may register and practice as a radiographer and it is therefore a responsibility of Higher Education Institutions (HEIs) to provide adequate support for all students to meet these standards and give them the best possible chance of succeeding.

In 2013, an internal attrition review was undertaken at the author's HEI and the findings from this indicated over-representation by certain groups amongst the students that failed to complete their education; these being mature students, those entering with qualifications other than A-levels (but excluding higher education qualifications), those with poor academic performance and those with a low socio-economic status (SES). It was also noted that the vast majority of attrition occurred during academic periods of the programme.[25] These findings caused some concern given that mature students form a large proportion of the student cohorts in health professions degrees [13, 25-28] and many of these enter with qualifications other than A-levels.[13, 25-27]

Similar concerns were raised in a 2009 qualitative study into mature students' experiences of radiography education. In this report, it was acknowledged that factors other than age will influence attrition. [26]

1.4 Educational requirements

In order to qualify as a diagnostic radiographer in the UK, a student must undertake either a BSc or MSc in diagnostic radiography taking two years for MSc, three years for BSc in England, Northern Ireland and Wales or four years for BSc in Scotland.[29, 30] On reviewing the published 2016 entry requirements, for undergraduate radiography programmes, candidates are required to have achieved

between 260 and 340 University and Colleges Admission Service (UCAS) points which equates to GCE A Level grades BCC to AAB.[31-56] For post-graduate entry, applicants require an Honours degree of classification 2:2 or above and one institution required this to be in a science subject.[54, 55] Students may also be accepted through alternative qualifications such as Access to Higher Education courses and Business and Technology Education Council (BTEC) awards or higher education qualifications such as foundation degrees.

Students achieving the entry qualifications for diagnostic radiography degrees would be eligible to apply for many other programmes of study. It is therefore essential that the choice of career and educational programme is made carefully and with an understanding of the profession which they are entering so as to avoid attrition related to the incorrect choice of programme. Gaining some prior knowledge or experience may help students to make a fully-informed decision.

Chapter 2: Literature review

2.1 Literature search strategy

The literature review searched the British Nursing Database, CINAHL Plus with Full Text, ProQuest dissertations and ERIC using the following search terms; Student AND Radiographer OR Radiography AND Attrition OR Retention OR Dropout OR quit OR quitting OR leave OR leaving OR persistence OR completion OR non completion OR non-completion OR continuation OR non continuation OR non-continuation OR discontinuation. This search yielded just five publications, two of which investigated admissions criteria in relation to student radiographer retention, one related to experiences of mature students which included retention, one examined the role of communication in retaining student radiographers and one focused on retention of therapeutic radiography students. Two of these were UK publications. In addition, two appropriate dissertations were identified although these were published in USA and Canada respectively. It was initially intended to exclude non-UK publications however the lack of literature required international publications to be included also. Through interrogation of citations a longitudinal survey by the Society and College of Radiographers on the experiences of students and recent graduates was identified which also provided some limited insight into the causes of attrition.[57-59]

There is clearly a gap in the literature published in relation to attrition specifically relating to student radiographers; much has been published from research in other health professions and although some commonality is noted, it is not known whether this evidence base is wholly applicable to student radiographers. It was therefore decided to repeat the literature search to include nursing, radiological technologists, allied health and medical students. This produced a further 21 articles.

2.2 Previous research into student radiographer attrition

A 2006 American study by Kudlas [60] investigated a possible relationship between admissions practices and student radiological technician (equivalent to student radiographer) retention. This study found that where competitive admissions processes were used, student retention was greater ($p \leq 0.05$). In the UK, competitive admission is the norm and therefore this information is not helpful to this project. This quantitative study used programme level data relating to 6,443 students from 327 programmes to report an overall attrition rate of 19%. The main reasons given for leaving were academic difficulties (39.5%), personal problems (31.7%) and career choice (18.4%). In this study factors such as high school/college grade point average (GPA) indicating previous academic achievement, writing samples, personal interviews and reference letters/checks indicating personal qualities and other aspects such as drug testing to indicate 'professional' qualities were used in the competitive process. Although actual GPA was not shown to be statistically significant, the use of selective GPA (targeting maths and science) was shown to be a significant factor in retention ($p=0.018$). However the strongest predictor in this study was the use of reference letters ($p=0.001$) suggesting that student aptitude, personality or previous experience could be the most influential factor in determining whether or not a student completes their studies.

A literature review undertaken in the United States of America (USA) in 2016 by Ingrassia [61] reviewed literature relating to admission criteria as predictors of academic or clinical success. This review included literature from professions other than radiography and it divided admissions criteria into cognitive (academic ability) and non-cognitive (personal qualities such as communication skills, references and persistence). These categories broadly reflect the significant factors identified in Kudlas' study [60]. This literature review supports the notion that both cognitive and non-cognitive factors play a part in the admissions process of successful students but there is little agreement as to what the non-cognitive factors are. There is strong agreement from the literature included that the academic factors deemed important are science and mathematics.

A 2007 Canadian dissertation by Gillis [62] explored reasons why health science students (including radiological technician students) left their programmes. This

thesis examined data from a three year period for students studying a range of programmes; radiological technology, diagnostic medical ultrasound, diagnostic cytology, respiratory therapy and nuclear medicine technology and highlighted rising attrition across all programmes with an overall average of 25%. For radiological technology the stated rates increased from 36% to 50% during this period. These programmes are not directly comparable to radiography education in the UK as direct training in particular imaging modalities is available in Canada but incorporated partially in to undergraduate diagnostic radiography curricula in the UK or as post-graduate qualifications to specialise. The study was a qualitative study involving semi-structured interviews with former-students who had not completed their studies. A total of seven students were interviewed, however only two of these were former radiological technician students calling in to question whether the findings from this small-sample study would be generalisable to student radiographers outside Canada. The pre-university academic qualifications of non-completers in this study were mainly high school qualifications (51%) and it was suggested that retention rates were better amongst students with some university experience. The study identified five main attrition themes, these being; incorrect career choice, lack of clear career pathway, unpreparedness for higher education, lack of faculty support/connection and stress due to financial or work-life balance difficulties.

An article published in 2005 by Hawking [63] discussed the role that successful communication between students and teachers played in student retention. It stated that effective learning as a result of good communication increased feelings of engagement for the student and students who felt more engaged were less likely to leave. However, it acknowledged that students have differing individual needs, both psychologically and motivationally that have to be met for this communication to be deemed effective. It recognised the challenge for the educator in trying to achieve this for all students. In the context of UK radiography education, learning activities take place in multiple settings and the educators are often clinical radiographers who are not necessarily experienced in education. Identifying and fulfilling individual student needs may be particularly challenging for them as they may only work with a particular student for a short period of time and whilst teaching the student, must also provide a high quality clinical examination and patient experience; the student may not be their priority. This article, despite mentioning student radiographers in an

early paragraph was very generic and did not appear to consider the specific needs or challenges of student radiographers *per se.*

In 2009, Williams and Decker undertook a qualitative study investigating the experiences of mature students studying diagnostic radiography in the UK in the hope of reducing attrition amongst this group.[26] This study identified disproportionately high attrition amongst mature students (71% of total attrition) and set out to identify the difficulties faced by mature students and to suggest ways to improve the learning experience of these students. This study found that despite being highly motivated, balancing the demands of the course with home or family life was the main difficulty encountered and on occasions this was insurmountable and led to withdrawal. However, this study was small scale (12 participants) and only related to students studying on a single programme so the results may not reflect the same experiences as students studying on a different programme. The authors made recommendations for further research to be undertaken into attrition patterns based on age categories and entry qualifications and this, together with the need to explore the experiences of mature students more widely than a single programme contributed to the decision to undertake this study.

Proffit's thesis [64] comparing traditional with non-traditional student radiographers in Virginia, USA found that non-traditional students were more likely to complete than their traditional counterparts. In this study, traditional students are defined as being between the ages of 17 and 22 and entering higher education soon after leaving high school. Non-traditional students are defined as being over 23 years of age and having responsibility for their own life-direction. The American and Canadian literature is treated with a degree of caution as the structure of the radiography education is not the same as in the UK however it is assumed that there are sufficient similarities in terms of final outcome and student experiences to make this literature at least partially relevant.

In 2010 an editorial was published by McNamara [65] relating to retention amongst therapeutic student radiographers. Whilst not directly relevant to diagnostic radiography students, some of the suggestions made would be reasonable to consider for both student groups; notably that not all attrition is bad. For some students, feeling pressured to remain on their programmes of study may not be the

right decision and could result in individuals unsuitable for the profession entering the workforce. This article quoted ‘incorrect choice of career’ as being the most prevalent reason for attrition from this group of students raising the question of whether students enter their studies with a clear idea of what they are undertaking.

The Society of Radiographers (SoR) undertook surveys of student radiographers and recent graduates in the UK in 2009, 2010, 2011, 2012 and 2014. The analyses of these surveys highlight reasons given by student radiographers for leaving or considering leaving their courses. Table 1 provides an overview of the results. [57-59, 66, 67]

Table 1. Comparison of reasons for attrition from diagnostic radiography education in the UK, 2009-2014

Reason for attrition (ranked)	2009 n=573	2010 n=479	2011 n=484	2012 n=468	2014 n=617
1	Wrong career choice	Financial problems	Wrong career choice	Financial problems	Failing parts of the course
2	Finding the course too difficult	Finding the course too difficult	Financial problems	Personal or family reasons	Wrong career choice
3	Dissatisfaction with clinical placement	Wrong career choice	Failing parts of the course	Dissatisfaction with clinical placement	Personal or family reasons
4	Dissatisfaction with course content	Dissatisfaction with clinical placement	Personal or family reasons	Wrong career choice	Dissatisfaction with clinical placement
5	Personal or family reasons	Too much work	Finding the course too difficult	Failing parts of the course	Finding the course too difficult
6	Financial problems	Personal or family reasons	Dissatisfaction with clinical placement	Finding the course too difficult	Financial problems
7	Dissatisfaction with education institution	Dissatisfaction with education institution	Too much work	Too much work	Too much work
8	Travel difficulties	Travel difficulties	Travel difficulties	Dissatisfaction with course content	Dissatisfaction with course content
9	Ill health	Ill health	Dissatisfaction with education institution	Dissatisfaction with education institution	Travel difficulties
10	Maternity/ paternity	Maternity/ paternity	Dissatisfaction with course content	Travel difficulties	Bullying

Wrong career choice remained a top five factor in all years of the survey suggesting that if students were fully aware of the reality and demands of this career before commencing training, this figure might be reduced. Finding the course too difficult and/or failing parts of the course also feature as top five factors across all years which raises the question of the preparedness of students for the level of study

associated with these programmes. Dissatisfaction with clinical placement features four times in the top five indicating the responsibility of HEIs and clinical departments in ensuring high quality clinical placements. Personal factors are difficult to define and explain but it is anticipated that this project will provide improved clarity around these. It appears that instances of students failing to return following maternity or paternity leave reduced over the years of the survey. A limitation of these surveys is that only students who were either enrolled or newly qualified radiographers were invited to participate and participants were invited to answer on behalf of others therefore the information relating to reasons for leaving is likely to have been reported by third parties and therefore may not be accurate. In addition, although the number of survey respondents was known (indicated by n in table one), it is not known how many responses were received in relation to attrition questions specifically.

2.3 Previous research into student attrition from higher education and current recommendations

There are numerous publications on the subject of student retention. Many authors have been widely cited and their work considered seminal. There is also significant literature surrounding retention amongst student nurses and medical students but there appears to be very little literature specifically around student radiographer retention. Just one journal publication on experiences of mature radiography students [26] was identified which mentions this topic specifically and a set of guidelines for improving student radiographer retention published by the Society and College of Radiographers (SCoR), both in 2009. That a set of guidelines such as these exists, suggests a longstanding problem however, the lack of further research or published literature since their publication and the ongoing reports of high attrition were factors that influenced the decision to undertake this study and add to the current sparse evidence base.

There are multiple factors that influence students deciding to withdraw from university education such as academic difficulty, ill-health, financial difficulty, wrong career choice or dissatisfaction with programme. [6, 12, 68-71] However it should be recognised that the decision is not always the student's. Attrition may be instigated or indeed forced by the HEI. Largely this will be due to academic or clinical failure [70, 72-74] but also disciplinary issues such as Fitness to Practise (FtP) [74] in professional programmes such as radiography, all of which deem the student unsuitable for entry into their chosen profession. This is an important consideration as whilst reducing attrition is desirable, appropriate standards must be maintained [23] and therefore 'failure' related attrition must be allowed to occur when necessary to ensure that new graduates possess the level of competence and knowledge required.

It is widely acknowledged that student attrition is often multifactorial [6, 16, 17, 70, 74] and therefore it is not easy to identify specific reasons why individual students choose to leave.[17, 74] This may be further complicated by the requirement for students to provide 'a' reason for withdrawing from their studies e.g. on withdrawal form which is not reflective of the multifactorial causation and which therefore skews statistics. This may introduce questioning of the SCoR survey findings summarised in table one which suggest only single causes of attrition; it is not known whether respondents were permitted to record more than one reason. Glossop's study of the use of exit interviews which allowed students to state more than one reason for leaving revealed that approximately 50% student nurses who were withdrawing cited two or more reasons for their withdrawal [75] and Thomas quotes an average of 2.1 reasons per student.[6] It has been suggested that students may not always reveal the true reason for choosing to leave, rather opting to state a reason that they feel might be acceptable [76] which can complicate the understanding of attrition and lead to incorrect focusing of resources to address it.

There is a wealth of literature theorising, describing and trying to explain dropout from higher education. The work of Tinto is widely cited and dates back as far as his 1975 publication 'Dropout from Higher Education: A Theoretical Synthesis of Recent Research'.[73] Interestingly, many of the current difficulties with trying to understand student attrition were identified then suggesting that progress in this field of research has been limited. There are criticisms in his work that much of the existing research

at the time failed to distinguish between permanent withdrawal and temporary cessation of study; nor did it differentiate between total withdrawal from higher education and transfer between programmes. This remains an issue with attrition reporting for radiography as in some reporting processes, attrition is calculated per cohort and therefore includes interruptions to study. It does not acknowledge the 'recycling' of interrupted students into subsequent cohorts. This research project acknowledges these issues; the focus is not on dropout from higher education altogether but rather on the failure of student radiographers to become radiographers and thus considers programme transfers as a cause of attrition from radiography education. Similarly, where interruptions to study are included in data, these students are excluded from attrition figures in this project. This is in line with the Department of Health (DH) definition of student attrition. [77] Tinto's work does criticise research of the nature of this project stating that comparing characteristics of those that dropout to those that do not does not mean that we understand the process of the student dropping out and even if we know why they leave, we do not know what to do to make them stay. [73, 78]

In the UK in 2012, the What Works? programme [6] made some progress in this respect through a series of projects resulting in the creation of an evidence base of best practice in terms of specific actions proven to be successful in improving student retention. [79, 80] It acknowledged that it was difficult to predict students at risk of attrition on the basis of entry characteristics and recommended a mainstream approach in retention strategies.

This project attempts to address Tinto's criticism through using descriptive and statistical information to form the basis for further exploration of support processes that may help to reduce attrition specifically amongst student radiographers.

Tinto states that background characteristics are insufficient to characterise dropout behaviours and suggests that other information such as expectations and commitment to achieving the final goal are factors in academic persistence i.e. they serve to minimise the likelihood of a student dropping out voluntarily.[73] Having realistic expectations is also highlighted as important in student nurse retention [18] and Wolf supports this notion in an article exploring health and well-being amongst medical students in which it is suggested that having realistic expectations of what it

takes to becoming a doctor prior to commencing medical school enhances the well-being of students [81] and it may be surmised that improved well-being may reduce the risk of health or well-being related attrition. It is not unreasonable to assume that this would also be applicable to student radiographers.

Tinto goes on to theorise that a cost-benefit model comes in to play when a student is considering withdrawing from higher education; when the perceived benefit to cost ratio increases for an alternative activity, a student's commitment will reduce and they are more likely to 'devalue' their education and drop out.[73] He also suggested that many universities had not yet successfully created actions from the research to improve student retention [78] however this was voiced several years prior to the What Works? Programme so some progress appears to have been made in this area.

It could be argued that student radiographers enrol on their programmes of study with a very clear career goal and may therefore be at an advantage in terms of goal commitment when compared to students undertaking other types of academic degrees. Crombie's 2013 study found that student nurses were more likely to compensate for poor experiences when they had a clear end career goal.[82]

It has been suggested that students need to be integrated both academically and socially for the best chance of succeeding and that the greater the integration, the greater the commitment to completion; the first year of college has been suggested as critical in achieving this sense of belonging.[6, 63, 71, 73, 78] The importance of engagement and belonging is reiterated by Thomas in the report from What Works? who showed that students who thought about leaving their courses were generally less engaged than those who stayed [6] and is also suggested by Hawking.[63] McKendry also adds the need for a sense of belonging in the clinical environment in addition to the academic environment for the student nurses in her study.[18] Student radiographers may be subject to the need to integrate three ways; academically and socially like all students but, like the students nurses in McKendry's study, also into the hospital environments during clinical placements. Some might suggest that those struggling to integrate in the university environment may feel very comfortable in the clinical environment which is ultimately where they aim to be and this may serve as a motivator for commitment to completion.[82] More

concerning is the possibility that a poor experience or disengagement during clinical placements may be sufficient to persuade a student radiographer to transfer to an alternative programme or withdraw completely. This emphasises the importance of a student's clinical placement representing the reality of their future role and the responsibility of those tasked to support them in ensuring that they receive a positive learning experience. It has been suggested that for some student nurses, the experience of clinical placements has been the deciding factor between choosing to leave or to remain on the course [17, 82] and in nursing; student attrition appears to be at its highest during clinical placements.[17]

Effective learning is also identified as a factor in improving student retention which should encourage educators to acknowledge the importance of their role in achieving this. [63, 78] The introduction of the Teaching Excellence Framework (TEF) in the UK in 2017 aimed to create a system which recognised and rewarded high quality education; it was acknowledged that in some HEIs, teaching was inflexible and subordinate to research and that this needed to change for students' outcomes to improve. It was also recognised that there was excessive variability in the quantity and quality of taught elements of degrees which may have created disadvantage for some students.[83] The TEF was introduced to ensure that HEIs are not able to charge students maximum fees unless the education is of a sufficiently high standard [84] thus providing value for money. HEIs must opt in to the TEF; in doing so they agree to be assessed under specified criteria and subsequently are eligible for award at a relevant level (gold, silver, bronze).[85] Whilst not mandatory, a TEF award may provide prospective students with both confidence and appropriate expectations in and of the quality of their education so as to make an informed choice of where to study. It is anticipated that TEF awards will be made at programme level rather than institutional level in the future [83] and this could provide even stronger assurance to prospective students as there exists at present, the possibility of variation in the educational quality of programmes within HEIs not being apparent in the TEF award held.

The UK government white paper, Success as a knowledge economy: Teaching excellence, social mobility and student choice [83] identified the need for more flexible ways of studying and included in this was the development of degree apprenticeships. At the time of writing, these are being developed for diagnostic

radiography and their implementation may prove to be a positive factor in training and retaining more diagnostic radiographers. In part this may help to address some of the causes of attrition identified in Williams and Decker's study [26] as apprentices would be employed by a single employer thus potentially removing the need to travel extensively to attend clinical placements and may relieve some of the financial burden of undertaking a full-time undergraduate degree. Additionally, with the majority of learning occurring in the workplace, mature students may feel an improved sense of belonging in this environment which is likely to be more familiar to them than in a university setting.

It has been discussed in the literature that relevant prior experience may help to create realistic expectations for students which in turn may aid retention. Many university entry criteria favour relevant work experience prior to commencing the programme and this is highlighted as a marker of good practice by the DH.[15] Student nurses who have previously worked as carers or have other nursing related experience have been reported as being more likely to remain on their programmes than those without such experience suggesting that this experience somehow provides resilience.[82, 86] However, it is anecdotally reported that prospective radiography students are experiencing increasing difficulty in accessing work experience and this is reaffirmed through discussion with undergraduate students at the author's HEI; the reasons for this are unclear but this could result in some students beginning their courses with less realistic expectations than would be ideal.

Trede *et al* suggest that work placements allow students to 'try on' professional roles [87] and although this article relates to placements forming part of the curriculum (comparable to clinical placements within a radiography degree programme perhaps), it is still relevant in the context of pre-enrolment work experience. However, it is the author's experience that not all prospective students who undertake work experience placements are provided with the opportunity to see the 'everyday' aspects of the career. At interview, when asked about their work experience, many prospective students report feelings of excitement about the fast-moving trauma or computed tomography (CT) departments yet few are able to comment on the experience of witnessing an outpatient appointment session consisting of routine examinations. This raises the possibility that they are not 'trying on the whole outfit' and poses the question as to whether students pursue their

university applications process with a realistic expectation of their chosen profession. If not, then disappointment is likely if early clinical experiences are not as expected. This may be a factor that could lead to students withdrawing through dissatisfaction with their chosen programme or through feeling that they may have made the wrong career choice. A study of medical students who prematurely left their programmes revealed that a common problem identified in the attrition cohort (regardless of their reason for leaving) was they had changed their minds about a medical career during the course of their studies [88]; it is possible that some prior experience of the profession (perhaps workplace shadowing) may have been successful in preventing some of this attrition due to students have more realistic expectations before they enrolled. The findings from Trede *et al*'s study suggest that early workplace learning (which work experience could be compared to) improves student persistence and encourages them to remain enrolled [87] and thus, in agreement with Tinto, the possibility should be considered that students undertaking effective work experience begin their studies with greater determination to succeed that those who do not.

Attrition rates from radiography programmes are high and there have been suggestions that attrition rates vary between differing student groups within the student radiographer population.[25] Several suggestions have been made of factors which increase the risk of attrition for nursing and midwifery students; being male [16, 74], having vocational rather than academic qualifications [74] academic struggling [76] and being young (under 25). [16, 74, 89] For medical students the list of suggested risk factors looks somewhat different; Lower A level grades/entry qualifications [90, 91] absenteeism [16], social isolation [16, 88, 92] and depression/psychological difficulties [16, 88] are implicated whilst academic struggling and being male are suggested as risk factors for medical students [88] as well as student nurses. There has been no published research from which to draw comparable information for student radiographers however Knapp's unpublished report suggests being mature, having non-traditional qualifications, academic struggling and having a low SES increase the risk of attrition.[25] These factors seem to have commonality with both nursing and medical student risk factors. Managing attrition is described by the DH as being akin to managing a 'wicked problem' where improvement can only be made when all known risk factors are

managed through a proactive, sustained and systematic approach [77] however this document does not indicate where the responsibility lies for managing it.

Instead of considering risk factors for attrition alone, many studies have focused on the reasons that students remain on their programmes. Understanding motivation for continuation could be of great importance for HEIs in order for them to focus support appropriately. As Tinto argues, knowing why students leave does not mean that we know what to do to make them stay [93]

2.4 Widening participation

Both universities and the NHS recognise the concept of widening participation (WP). [94, 95] In its 2014 Health Education England (HEE) consultation document 'Widening Participation – it matters', there is a clear strategy to ensure that the NHS workforce truly represents the communities that it serves. It is assumed that this includes all social, cultural and educational backgrounds. There is also recognition that at present, HEE does not achieve this. The document suggests that further work is required to increase participation from groups which are under-represented but does not elaborate on which groups these are.[94] In light of this NHS goal, it would seem that the WP agenda for HEIs is wholly relevant to student recruitment into NHS commissioned or healthcare related educational programmes. WP has been extensively researched and documented worldwide however, on examination of the literature, it appears that the definition of widening participation is fluid and has changed significantly since the concept was first introduced.

WP in HE was first documented in 1963 when the Robbins report identified a need for a new system which would enable access to HE for all who had the qualifications and commitment to do so. It also set out the requirement that academic awards only reflected academic performance and that artificial differences due to status should be eliminated in order to recognise only achievement.[96] In 1997, Report 5 issued by the National Committee of Inquiry into HE mentioned the under-representation of women, students from ethnic minorities and students who were referred to as 'alternative'; in the context of that report, this meant mature students (over 21 years of age) and those entering without A-levels. The report also briefly mentioned

disabled students although did not expand on this definition and acknowledged differences in social class, suggesting that fewer students from lower social classes (low SES) entered higher education.[97]

The 1997 Dearing report [98] acknowledged an increasing diversity of students in higher education, notably an increase in mature entrants, part-time students and women which suggested the possibility that the under-representation identified in Report 5 may have already begun to improve. Increases of 10% and 15% over the preceding 9 years for women and mature students in HE respectively were reported. It was stated that the proportion of women in HE at this point reflected the country's demographics suggesting that women may no longer have been under-represented in HE, but perhaps were within certain disciplines. Lesser increases of the order of 2-5% were recorded for ethnic minority and low SES students. A 12% decrease in the number of students entering with A-level qualifications was also noted, implying an increase in the number of non A-level students. Despite these apparent improvements, the Dearing report went on to identify possible social division caused by under-representation from lower socio-economic groups, certain ethnic groups and those with disabilities.[98] Prior to the publication of this report, it had been suggested that participation from students with low SES had in fact worsened [99]. In this case, SES was based on family income.

It has been suggested that as few as 14% of students with low SES enter higher education compared to 33% from high SES.[100] This inequality is recognised by the UK government in their policy paper 'Higher Education Participation' where the aim to increase the number of students from disadvantaged backgrounds is set out.[101] Several methods have been and are used to identify low SES. At the time of writing, in addition to income, free school meals (FSM), participation of local area (POLAR) and type of school are all recognised as indicators of low SES [95, 99, 100]; not all metrics may be accurate however. For example, a student may be entitled to free school meals but not claim them and therefore be excluded from government statistics.[95] The student's school may be classified according to the number of students moving into HE and admission requirements may be lower for those from low participation schools (those where low numbers of students traditionally move into HE).[28] Such schools may recruit students from communities diverse both socially and culturally.

In a 2006 report on barriers to higher education participation, the suggestion was made that wealth may also be instrumental and that students from low income backgrounds were less likely to be in HE.[102] For the cohorts studied in phase one of this project, radiography education was funded through commissioning by HEE, a branch of the NHS. These students were also entitled to apply for means-tested bursary support during their studies [103] which further added to the cost to the NHS. From 2017 however, this HEE support was withdrawn and replaced with student loans thus transferring the full cost of education (and attrition) directly to the students. With wealth being considered influential in the decision to enter or remain in HE, there is the possibility that less wealthy students may take a more cautious approach when considering their career and educational options. This may also be the case for other students such as those with existing financial responsibilities. A 2016 small scale study by Hopkins revealed that fewer than 50% of two student cohorts surveyed (first and second year) would have enrolled on the Radiography degree had there not been bursary support available; mature students responded as being the least likely to have enrolled.[104]

Regardless of the source of funding, student radiographers are still required to support themselves during their training. They may have limited opportunities to take on part-time or seasonal employment due to the fact that radiography programmes commonly employ an 'extended academic year' to accommodate clinical placements in addition to academic study. Financial pressure is a commonly cited reason for students withdrawing from university although according to survey results from the Society of Radiographers, in 2014 it was only the sixth most reported reason for students leaving their courses [57] the same as it was in 2009 [66] as opposed to the top or second most reported in 2010, 2011 and 2012 (for diagnostic radiography).[58, 59, 67] For therapeutic radiography the pattern is similar although not identical. This reflects the reasons given by students for choosing to study radiography; in 2009 the availability of financial support ranked highly as an influential factor in their decision but by 2014, this was the least important. [57-59, 66, 67] This may suggest that students are in a better financial situation now or it could also suggest that other factors have escalated and overtaken the financial issues indicating that student radiographers are under more pressure than ever from multiple factors. This level of detail is not available from these surveys and the

surveys are largely anecdotal, allowing participants to answer some questions on behalf of their peers. Many students still work to support themselves whilst undertaking their training and this may reduce the time available to them for study and have an impact on their success. Post 2017, this financial support is no longer available [105] and the effect of this will not become apparent in terms of retention until these cohorts begin to graduate.

The 2004 Aim Higher Programme was a government initiative to increase participation in HE by young people from disadvantaged backgrounds through the raising of awareness, aspirations and provision of support, both educational and financial. One year after its launch, this programme was evaluated and deemed to be successful in meeting its objectives.[106, 107] The Aim Higher programme was ended in 2010 by the coalition government with the justification being that HEIs should be providing this support. At the time of writing, this is where the responsibility remains and therefore underpinned by the outcomes of Aim Higher, recruitment and support of students from disadvantaged backgrounds needs to remain a high priority for HEIs.

In 2011 the government published a document entitled 'Guidance to the Director of Fair Access' which recommended that in addition to the under-represented groups already identified in this discussion, that care leavers i.e. students who had been in the state care system were to be included as an under-represented group but that women no longer featured [108] supporting the implications from the Dearing report.

During 2014 and 2015 a further scheme was launched known as the National Networks for Collaborative Outreach (NNCO) which provided funding with the aim to build relationships between schools and universities with the outcome of encouraging wider participation. At the time of writing this has yet to be evaluated.

As mentioned previously, students from ethnic minorities must be considered in terms of WP but it could be questioned whether or not ethnicity is a true WP characteristic as this has been demonstrated as not statistically significant as an influential factor in the progression to higher education of disadvantaged students.[109] The Office for Fair Access (OFFA) however, does consider students from some ethnic groups or sub-groups as under-represented groups but does acknowledge that some ethnic groups have higher participation rates than white

groups but that these are concentrated in certain institutions and subjects.[110] Whilst acknowledging that ethnicity remains on the WP agenda, for the purposes of this project, it will not be explored any further as the ethical approval for the project prohibited the gathering of ethnicity data.

The final key group to consider is mature students. This group is mentioned in most of the articles cited previously. Healthcare courses such as nursing have seen increased numbers of mature students enrolling over recent years with proportions of mature students being reported as up to 80% in one study.[28, 111, 112] No published literature could be identified to provide overall participation rates relating to mature radiography students but anecdotal information from radiography educators suggests that the number of mature students enrolled on radiography programmes is higher than the average for other, more traditional degree programmes. It is suggested that in nursing education, mature students are desirable as they bring with them caring experience and skills that younger students have yet to develop and they tend to do better academically than their younger counterparts [89, 111] For many, being able to return to study and become a nurse may be the fulfilment of a lifetime ambition [112] or a clear path to a new career.[28] However, mature students may experience other difficulties not affecting their younger peers such as financial pressures [111] and balancing study with other commitments. [28, 89] They may also have reduced choice in relation to where they study; pre-existing factors such as where they live might limit them to their local HEI and this may result in their own habitus not matching that of the HEI as well as it might match that of another; this is acknowledged to have a negative impact on engagement and retention.[6] As discussed previously, the development of degree apprenticeships may go some way towards addressing these potential issues. Attrition rates in mature student nurses are reported as being high with figures exceeding 10% in the first year or over 25% in total.[28, 89, 111]

Disabled students should also be considered at this point as there are requirements of the professional role which may prohibit some minority groups from entry into these programmes even under WP rules. Whilst reasonable adjustments could be expected, there are certain physical requirements of the role of a radiographer for which some disabilities would be prohibitive e.g. blindness. Whilst support and adjustments for a blind individual on a day-to-day basis or in the academic

environment may be possible, as a radiographer they would be accountable for radiation exposures and therefore must be able to verify first-hand, factors such as equipment settings and patient position. However under the ethical approval sought to undertake this project, the collection of disability data were prohibited and therefore no further consideration will be given to disability in terms of student participation or success.

With this brief literature summary in mind, it appears that the student groups identified as being over-represented in attrition rates in Knapp *et al*'s report i.e. mature students, students entering with non-A level qualifications and students with low SES [25] are those that could be considered under the WP agenda.

It is recognised that it is important that HE is accessible to students from all demographics and only by achieving this can the NHS fulfil its goal of creating a workforce that truly represents the communities it serves. [94] However, increasing the diversity of the student population is not enough; students from all backgrounds should also have equal chance of success. It is therefore unacceptable to recruit students from particular groups just to meet target numbers; these students must be appropriately supported to maximise the chance of success if it is considered that they are less likely to do so than other students.[28] Support for students studying radiography may take many forms which reflect the core values of WP. The impact of changes to funding and financial support is yet to be seen but the literature reviewed suggests that there is a risk of increased attrition as a result of these changes. Other required support may be pastoral, cultural, religious, health-related, disability or educational and if HEIs undertake to recruit WP students they must also be prepared to provide or facilitate this support.[6] Following introduction of the TEF, all participating universities must provide either an Access Agreement or a statement confirming how WP will be supported.[85]

To conclude, subsequent to review of the current literature, it is suggested that students without a clear career goal or those with limited understanding of the role of diagnostic radiographer, students who do not feel engaged with their programme or HEI, mature students, students holding non-standard entry qualifications, students fulfilling WP criteria and students experiencing academic or financial difficulties may be at increased risk of attrition.

Chapter 3: Methodology

3.1 Development of methodology

This study adopted a pragmatic approach to explore both the quantitative and qualitative phenomena that contributed to the outcomes or experiences of the student radiographers.[113] This research philosophy promotes an open-ended form of inquiry through which the answers to questions (knowledge) are assumed as being sufficient to cope with the problems faced until the need to revise them is identified; a means of providing tools with which to cope.[114]

The concept of pragmatism has been debated and argued by authors, often with dismissal of one another's opinion however there is agreement that pragmatism does not necessarily agree with the notion of objective 'truth' as being mutually exclusive from subjective opinion. Peirce was one of the early writers on the subject and he broadly described it as a search for what might be believed [115], Rorty, who is described as a neo-pragmatist [114] uses the term to describe justification of belief.[116] Despite the debate over how pragmatism is defined, it has nevertheless become an accepted philosophy but it has been criticised for allowing "nothing over and above that which serves particular interests and answers particular problems".[114, p11] This might be considered to mean acknowledging only the 'here and now'. However, due to the lack of existing research in the area of this study, understanding something about the 'here and now' suggests that a pragmatic approach is appropriate for this study to provide preliminary ideas that may create foundations for future research. Pragmatism provides a framework to answer research questions using whichever methods are appropriate without the need to take a rigid research stance e.g. positivism or interpretivism.[117]

Positivism assumes that there is an objective, empirical answer which can be found and tested [117] whereas interpretivism assumes that the truth is constructed in the mind and is therefore subjective and open to influence.[117] The mixed methods design of this study incorporates aspects requiring both positivist and interpretivist approaches.[118] This situates the project within the post-positivist philosophy which rejects the notion of truth in positivist terms and instead aims to create knowledge or

make progress in understanding through acceptance of all findings.[119, 120] Post positivism has been suggested as effective at reducing researcher bias and improving generalisability through utilising different tools to investigate the issue from a number of perspectives.[118]

For a mixed methods study such as this, the flexibility permitted within a pragmatic approach is beneficial.

3.2 Project Aim and Objectives

Aim:

To explore diagnostic student radiographer attrition on a national scale in relation to particular individual characteristics.

Objectives:

To identify predictors of attrition.

To identify strategies students employ to overcome challenges which could lead to attrition.

3.3 Introduction to methodology

The study consisted of two phases:

Phase one: Quantitative retrospective survey of student data from 579 student diagnostic radiographers from three English HEIs to establish any statistically significant associations between students' characteristics and attrition.

Phase two: Qualitative national online survey of 186 current student diagnostic radiographers to provide narrative around the challenges faced by student radiographers with differing characteristics that may cause them to consider

withdrawing from their programme of study along with strategies used to overcome these challenges and enable continuation of studies.

3.3.1 Phase one methodology

This phase gathered data from HEIs relating to students undertaking pre-registration diagnostic radiography education in the UK during the years 2009 to 2014 in order to provide comparable characteristics for those that completed their courses and qualified as radiographers and those that did not complete their courses with the intention of identifying any predictors of increased attrition.

The project was introduced to potential participants via a Heads of UK Radiography Education meeting during which potential interest was gauged and verbal agreement to participate was gained. There were sufficient positive responses from this meeting to progress the study with twenty one HEIs verbally agreeing to participate.

3.3.1.1 Ethics

Ethical approval was sought for this project as it required the sharing of student data (although anonymised) between institutions. Although no data could be traced back to individual students, because the students were unaware of the sharing of these data, and there existed the potential for the researcher to identify potentially differing outcomes for students at different HEIs, ethical implications were considered and approval granted.[121] With the exception of this possibility, the project was ethically straightforward without risk of harm to the students whose data were collected and with the ability to protect the anonymity of the individual participant HEIs in reporting of the results. There was also no requirement for any form of deception or coercion. [121] The ethics application was rejected initially as the project originally sought identification of students from ethnic minorities in addition to other characteristics; however, this was considered by the university data protection officer and ethics

committee to be sensitive data and was therefore not permitted. Once this had been amended, ethics approval was granted (Appendix 1).

It was necessary to seek an extension to the ethics approval as the data collection took longer than anticipated and the initial approval expired before it was complete (Appendix 1).

3.3.1.2 Information and consent forms

An information sheet outlining the background to the study, its purpose and an explanation of the data required and how it would be collected was developed (Appendix 2) to ensure that participants fully understood the implications of taking part. It also clearly stated that participants could withdraw from participation at any point. A consent form was also developed (Appendix 3) in which participants were asked to confirm permission from their institutional data protection officer or governance department to share the data. A signature from the institution's data protection officer was required to ensure compliance. Institutions were offered the option of receiving their individual data analysis and were asked to provide contact information for communication of this.

Copies of the information forms were distributed in person to potential participants to take to their institutions to establish whether they would be willing to take part. This was accompanied by contact details and a request to email the researcher if they were able to participate.

Once the suitability of the participant's email address had been established i.e. it was confirmed that it belonged to the individual named and was not a generic mailbox, the consent form, coded with the identification number allocated to that institution by the researcher was sent. Data collection for that institution commenced only when the signed consent form was received.

3.3.1.3 Participants

The final number of participant HEIs was three; all of which are classified as civic universities. There was limited geographic representation with all participant HEIs located in the west of England (north and south).

3.3.1.4 Data collection Pro forma

Data were collected by way of a spreadsheet that was created in Microsoft Excel ®. This spreadsheet was sent to participants by email. It was presented to participants with examples of the expected format for data relating to both completing and non-completing students, together with titled columns for population with student data. For the purposes of populating the spreadsheet, a student identification column was included to ensure that if there was requirement for the spreadsheet to be passed between individuals or departments for completion, the correct data were entered for each student. This student identification column was clearly identified on the spreadsheet template with an instruction to ensure that it was deleted prior to returning the spreadsheet for analysis to ensure that no individual student may be identified. This was to ensure compliance with the requirements of the Data Protection Act. [122] The data requested for students who completed their programmes were:

- Age on entry
- Gender
- Highest qualification on entry
- Tariff (where applicable)
- Low socio-economic status (yes/no)
- Widening participation (yes/no)
- Module average marks

The data requested for students who did not complete their programmes were:

- Age on entry
- Gender
- Highest qualification on entry
- Tariff (where applicable)
- Low socio-economic status (yes/no)
- Widening participation (yes/no)
- Marks for individual assessments
- Number of months of programme completed
- Stage of programme during which student left (academic/clinical)
- Reason given by student for leaving.

The spreadsheet differed for completers and non-completers as in order to accurately represent academic performance of non-completers, it was important that any zero marks recorded for assessments not attempted i.e. if the student left before completing all assessments were not factored into the mean. The student may have achieved high marks but had to leave for non-academic reasons; this would have confounded mean module marks and thus run the risk of the student being incorrectly identified as academically weak. For completers, all assessments would have been completed therefore the mean mark accurately represented their academic performance. The data request for non-completers also incorporated the number of months completed and whether that student left during clinical or academic stages of the programme. This was to identify whether there were peak times for attrition as is the suggestion from research in the nursing profession.[17] Finally the reason given by the student for leaving was requested as although it is widely accepted and expected that attrition is multi-factorial [75], the primary reason given by the student is the only documented data available and may provide an indication of the most significant reason from the student's perspective.

3.3.1.5 Preparation of data for analysis

Some adaptations to the format of returned data were required in order for analysis to be completed.

One participant returned data stating date of commencement and withdrawal for non-completers rather than months completed and stage of withdrawal. In order for this information to be transposed for analysis, a request was made to the participant for a document outlining the model of attendance and it was then possible to calculate the point (academic, clinical or end of year) at which the student ceased attending. The number of months completed was calculated from the start and withdrawal dates provided. In several cases there was a significant time delay recorded between 'suspension date' and 'withdrawal date'. Where both of these data were provided, the suspension date was utilised as it was felt that this more clearly reflected the point at which the student made the decision not to continue. It should be noted that there may be a degree of inaccuracy introduced during the transposition of these data as the attendance model for the years in question was not available and so the model for the current cohort was provided It was confirmed with the participant that attendance was broadly the same every year but because this could not be confirmed and there were some short clinical placement periods, there is a risk that a few data may be inaccurate where dates given fell on the threshold between clinical placements and academic blocks i.e. calendar variations could have changed whether the time was clinical or academic. 25% of the final data originated from this HEI. On review of the attendance pattern for this programme, it demonstrated 5 occasions (month end was used) where this may have been a possibility. If it were assumed that 25% of the total attrition in these months were incorrectly categorised, this would result in 5% of the data being inaccurate. This was considered acceptable as it reflects the worst case scenario.

For another participant, the pro forma had been amended before being returned to include categories which were prohibited under the ethics approval (disability and ethnicity) and therefore could not be used for analysis. The pro forma was returned to the data provider with a request to include only the information requested. It was duly amended and returned.

The data from all participants were combined into a single MS excel spreadsheet, exported into IBM SPSS Statistics (25) ® and coded for analysis as follows:

Participant I.D: This was allocated numerically (1 – 3) according to the order that data were received.

Completion status: Non-completer = 0, Completer = 1.

Gender: Female = 0, Male = 1.

Highest qualification on entry: This yielded a wide variety of responses. Due to as few as one or two students being in possession of some of the listed qualifications, in order to increase statistical power these qualifications were further categorised as shown in table 2:

Table 2: Categorisation of entry qualifications for student radiographers

1	2	3
A-level Scottish Higher Baccalaureate Other level 3 qualification	NVQ (National Vocational Qualifications) ONC/D (Ordinary National Certificate/Diploma) HNC/D (Higher National Certificate/Diploma) Access to Higher Education Level J qualifications BTEC (Business and Technology Education Council) SQA (Scottish Qualifications Authority)	Foundation degree Certificate or Diploma in Higher Education Undergraduate modules First degree Master's degree PhD

The rationale behind the allocation of each qualification into its new group was that category 1 (hereafter referred to as A level for brevity) should represent academic qualifications that would traditionally be acquired at sixth form (year 13) for access to higher education, category 2 should represent qualifications considered to be alternatives to A-level for access to higher education and category 3 should represent higher education qualifications.

Socio-economic status: High = 0, Low = 1.

Widening Participation: No = 0, Yes = 1.

Reason given for leaving:

1. Medical
2. Personal
3. Financial
4. Academic failure
5. Transferred to alternative programme (voluntary)
6. Unsuited to course or career
7. Deemed withdrawn (withdrawn by HEI for reasons other than academic failure)
8. Expulsion
9. Other (not defined)

Academic marks: Any ‘zero’ academic marks recorded were assumed to represent modules or assessments that had not been attempted as it would seem unlikely that a student would fail to achieve even a single mark in an assessment and were therefore excluded from analysis to avoid misrepresentation of academic ability.

Although for basic analysis, marks were required in their raw form, they were also categorised into ‘degree’ categories i.e. fail (<40%), third class (40-49.4%), lower second class (49.5-59.4%), upper second class (59.5-69.4%) and first class (>69.5%). One participant did not return any academic mark data for non-completers and just a final degree classification for completers so categorising in this way allowed inclusion of these data in the analysis.

All other data were retained in their raw form with age on entry, tariff, and the number of months completed recorded as integers.

Missing data: Any missing data were identified and coded with '.'

3.3.1.6 Data Analysis

The following statistical tests were undertaken on the combined data from all participants:

i. Histograms, Kolmogorov-Smirnov and Shapiro-Wilk tests of normality to assess the distribution of continuous data (age, tariff and academic marks). None of these distributions were normal and so all further statistical tests for these data were non-parametric.

ii. Median, inter-quartile range (IQR) and Mann Whitney U test on continuous variables (age, academic marks and tariff) comparing completers with non-completers.

iii. Chi-square test of independence between completion/non-completion for characteristics where variables were categorical i.e. gender, highest qualification on entry, SES, WP status.

iv. Binary multivariable logistic regression to establish the odds ratios of completion based upon characteristics where statistically significant differences are identified in ii. and iii.

v. Cross-tabulation and identification of trends relating to reasons for withdrawal for the categories of students where statistically significant differences exist between completers and non-completers.

3.3.2 Phase Two Methodology

This study gathered data directly from current student radiographers across the UK via an online survey in order to explore whether the findings from phase one reflected the experiences of current student radiographers. The assumption was made that students who had considered giving up their studies may be representative of non-completers whose data contributed to phase one of the study. As the majority of voluntary withdrawals identified in phase one were due to personal reasons, it was intended that some understanding of the personal difficulties experienced and strategies used to overcome them would be established. The survey was also intended to improve understanding of the difficulties associated with being a student radiographer and the strategies that help students to remain enrolled on their programmes.

3.3.2.1 Ethics, information and consent

Ethical approval was sought and approved by University of Exeter Medical School ethics committee. The ethics application form and approval certificate are included as appendices (Appendix 4)

As this survey was conducted online, the participant information and consent confirmation were incorporated into the survey. The first page contained all necessary participant information including a clear statement about participation being voluntary and where to seek support in the unlikely event that participating in the survey were to cause any distress (this was felt to be unlikely however it would not be possible to know of any past experiences that a student may have had so could not be guaranteed). The survey also required a positive response to the statement 'I consent to participate' after the information page in order to access any of the questions. As the survey was conducted anonymously, there was no option for participants to withdraw from the study once responses had been submitted; this is contrary to the usual requirement that participants must be able to withdraw from a study at any time without penalty. This was managed in three ways: through the

inclusion of a clear explanation in the information sheet that once a response was submitted it could not be traced back to an individual and therefore could not be removed; the introduction of a second consent confirmation at the end of the survey; and the explanation that any responses that were incomplete or lacking the two stage consent confirmation would be deemed to be withdrawn and discarded.

The online survey was developed using Online Surveys (Jisc, 2018) ®. The survey included both multiple choice and free-text questions relating to topics where statistically significant outcomes were demonstrated in phase one (Appendix 5). The survey was piloted amongst academic staff members to ensure that responses were appropriately recorded. No changes were made following the pilot. The survey was then circulated to student diagnostic radiographers in all stages of training via the Heads of Radiography Education group using email and institutional social media.

The survey was open for one month as to adhere to the ethical requirement of participation being entirely voluntary, following the initial release, no further reminders were sent to students to participate. It is suggested that the majority of survey respondents respond within two weeks of being invited to do so [123] therefore allowing for variations in attendance patterns for different programmes (and the associated possibility of the survey being open when students were not in attendance), this was considered to allow sufficient time for those who wished to participate to do so. The final response rate was 5%.

3.3.2.2 Participants

Participants were diagnostic student radiographers, currently enrolled on a UK degree programme i.e. they had commenced their degree programmes during academic years 2015-16, 2016-17 or 2017-18. Participation was voluntary and potential participants were invited to take part via direct communications (e mail and social media) by the programme leaders from their HEI. The total population of student diagnostic radiographers eligible to participate was estimated at 3,690. This figure was estimated by adding published enrolment numbers for 2015 and 2016 [4] and calculating the mean of these to estimate the intake for 2017 as actual numbers are unpublished at present. A reduction of 14% was then applied to represent likely

attrition. [4] A target of 500 participants was set in order to achieve a sufficiently large sample size to enable estimation of 95% confidence intervals to within +/- 4.4%. This was calculated on the assumption of the widest possible confidence interval to ensure that estimation accuracy would exceed this. The following formulae were used:

$p - 1.96 \times \sqrt{\frac{p(1-p)}{n}}$ to calculate the lower limit and

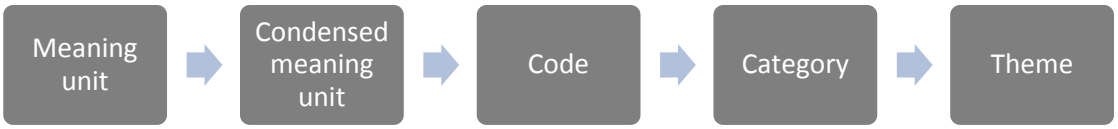
$p + 1.96 \times \sqrt{\frac{p(1-p)}{n}}$ to calculate the upper limit where p=0.5 and n=500.

3.3.2.3 Data analysis

The ages and entry qualifications were compared, using Mann Whitney and Chi squared tests, between the respondents from the phase two survey and the student data collected in the phase one survey to identify any statistically significant differences between the populations.

The qualitative responses were coded and analysed using basic content analysis according to the model described by Erlingson *et al* and Drisko. [124, 125]

Figure 1: Flow chart to show stages of content analysis [124]



This approach involves breaking down individual comments or complex responses into shorter, themed segments [126]which identify any individual issues mentioned (meaning units). These are then summarised into brief statements or key words (condensed meaning units) then coded. The codes are placed into categories and

finally into themes.[124] For a study such as this where free text responses were not limited in terms of the themes that might emerge, the ability to break down complex responses was desirable in order to explore topics individually as well as collectively.

Basic content analysis is documented as having been widely utilised to assess the proportions of material attributed to particular topics in order to establish the relative emphasis placed on each.[125] In the context of this study, this is appropriate as in order to make recommendations, it is important to understand the potential impact of their implementation to the student radiographer population as a whole i.e. wide-spread challenges, if resolved would likely have greater impact than resolving those faced by just a few. As this study aimed to explore student radiographer attrition on a national scale, widely reported issues are of particular interest.

It is also suggested that basic content analysis, as distinguished from other forms (e.g. interpretive or qualitative content analysis) is suitable for analysis through quantitative means such as descriptive statistics [125] and has successfully been used to distinguish individual groups [127], both of which were required for elements of this study.

In order for content analysis to be appropriate, the context and meaning of the data must be retained [124] and therefore the data were sorted into groups according to the risk factors identified in phase one of the study i.e. mature/non-mature students, A-level/non-A-level qualifications before the themes were explored. This was appropriate to ensure that the experiences of the different groups could be compared and any issues that particularly affected a group would become apparent.

Chapter 4: Results

4.1 Phase One; quantitative survey

This phase of the study analysed anonymised demographic and academic data from past diagnostic student radiographers to explore whether completion outcomes differed in relation to individual students' characteristics.

4.1.1 Overview

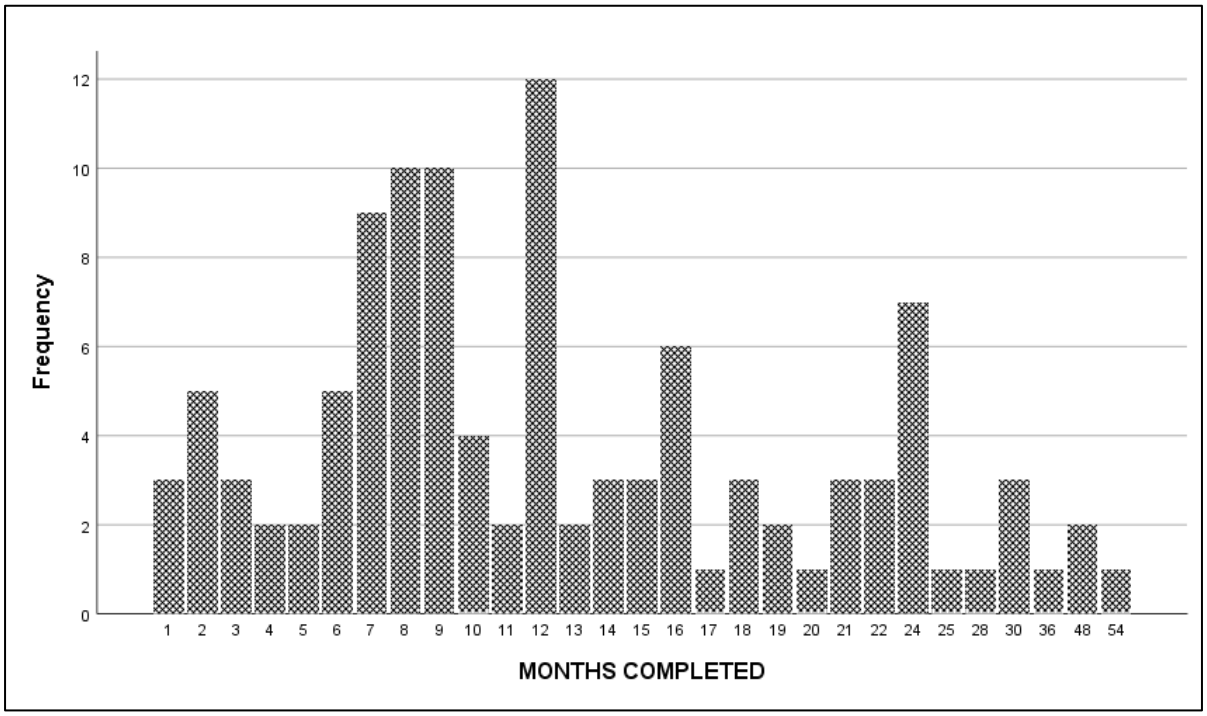
The final data represented 579 student diagnostic radiographers; 468 completers and 111 non-completers. The total number of students enrolled for these cohorts was 6685 [128, 129]; the data represented 8.6% of the total population.

Data were returned from three HEIs out of the twenty one that verbally indicated that they would participate. Two others returned the consent form but did not return data despite allowing an extended timeframe to do so. The descriptive findings are outlined as followed with statistical analysis provided in section 4.1.3.

Attrition of 19% was reported across all three HEIs. 64% non-completers left during academic periods, 28% during clinical placements and 8% at the end of an academic year with personal reasons being the most common reason given (41%).

Most attrition occurred during the first year and the most common time for withdrawal was twelve months after the start of the course i.e. just before or at the start of year two; but withdrawal occurred at between one and 54 months. Figure 2 illustrates the distribution of months completed before withdrawal. It suggests that there was increased attrition at or towards the end of each year including the third year of normal programme duration and attrition still occurred during extensions to normal programme duration. This may have been due to academic failure following end of year or final examinations or to students' attempts to complete the year before leaving voluntarily.

Figure 2: Bar chart demonstrating distribution of withdrawal according to number of months completed.



4.1.2 Data anomalies and missing data

There were substantial missing data which are identified in table 3.

In addition, it was noted that for one HEI, all students were assigned a tariff of either 280 or 300 which would appear unlikely in terms of actual attainment. This may represent the required entry tariff rather than tariff attained and was therefore different to the data returned by the other HEIs. Another HEI provided final degree classifications for completers rather than module marks however it was possible to reconfigure data from other HEIs to this format so that it could be included in the analysis.

4.1.3 Results from statistical tests

Chi-squared tests and Mann-Whitney tests were performed to identify any significant differences in characteristics between completers and non-completers (table 3).

Table 3. Results of statistical tests comparing characteristics of completers with non-completers. ¤ denotes chi-squared test, § denotes Mann-Whitney test

Characteristic		**Completers (n=468)**	**Non-completers (n=111)**	**p value**
Sex, n (%)	Male	132 (28)	32 (29)	0.90 ¤
	Female	336 (72)	79 (71)	
Age on entry, median (IQR)		20 (18-27)	23 (19-31)	<0.005 §
Highest qualification on entry, n (%)	A level	251 (54)	37 (33)	<0.005 ¤
	Alternative	65 (14)	31 (28)	
	Higher	135 (29)	17 (15)	
	Not reported	17 (3)	26 (23)	
Tariff, median (IQR)		300 (280-340)	300 (280-300)	<0.005 §
	Not reported, n (%)	113 (24)	27 (24)	
SES, n (%)	low	72 (24)	20 (32)	0.18 ¤
	high	227 (76)	42 (68)	
	Not reported	169 (36)	49 (44)	
WP student, n (%)	yes	110 (24)	16 (14)	0.22 ¤
	no	241 (52)	23 (21)	
	Not reported	117 (25)	72 (65)	
Academic marks, median (IQR*)*		63 (58-68)	49 (42-60)	<0.005 §
	Not reported, n (%)	117 (25)	24 (22)	

Assigning a significance level of 0.05 it can be seen that age on entry, entry qualifications, tariff and academic marks were characteristics that demonstrated significant differences between completers and non-completers ($p<0.005$). However, a quarter of the tariff data were missing and the data from one HEI (representing 35% of the total) were atypical and therefore it is unlikely that the statistical results based on tariff are reliable. For this reason, tariff was not included in any further statistical tests.

The characteristics that were significantly associated with completion status (excluding tariff) were included together in binary multivariable logistic regression to calculate odds ratios (OR) and 95% confidence intervals (CI) for completion. The Omnibus tests of Model Coefficients produced a p-value of <0.005 and chi-square statistic of 116.7 with 4 degrees of freedom (df) which is greater than the critical value of 9.48.[130] The positive predictive value was 90% and negative predictive value 82.8%. Together, these results indicate that the model performed well in terms of predicting correct outcomes and those outcomes differed for students with different characteristics. The estimated ORs with 95% CIs and p values are demonstrated in table 4.

Table 4. Odds ratios and 95% CIs for completion based on characteristics.

Characteristic	**OR (95% CI)**	**p value**
Age on entry	0.919 (0.875-0.965)	<0.005
A level qualification	Reference category	
Alternative Entry qualification	0.439 (0.170-1.130)	0.08
Higher Education entry qualification	0.434 (0.187-1.006)	0.05
Academic marks	1.178 (1.128-1.229)	<0.005

The estimated odds ratios indicate that the odds of completing significantly reduce with increasing age on entry, and significantly increase with increasing academic marks. The OR for students with higher education qualifications is statistically significant and therefore some effect is evidenced; however, the range and academic

level of qualifications in this category is large due to few students holding each so caution is required when interpreting this result.

4.1.4 Trends relating to reasons for leaving

Statistical testing was not possible for the reasons that students in each group left their courses, due to low numbers in some categories. However, cross-tabulation and clustered bar graphs were used to explore and illustrate the distribution of reasons given for leaving amongst different group of students based on the characteristics identified as significant in terms of completion outcomes. These are shown in table 5 and figures 3-5.

Table 5: Frequencies of reasons given for non-completion.

Reason for non-completion	**n (%)**
Personal	45 (41)
Academic Failure	17 (15)
Unsuited to course	15 (14)
Deemed withdrawn	11 (10)
Medical	7 (6)
Transfer programme	5 (4)
Financial	3 (3)
Other	2 (2)
Expulsion	1 (1)
Not reported	5 (4)

Figure 3. Proportion of attrition for each reason by mature students and 17 to 21 year olds.

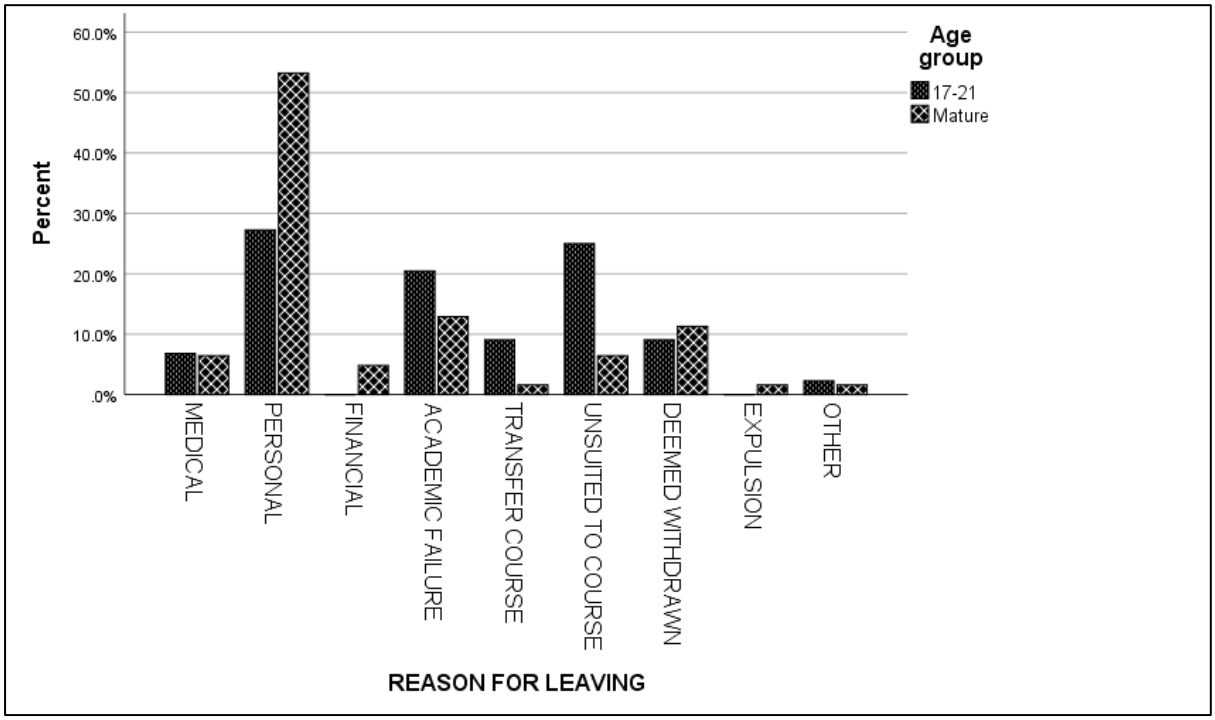


Figure 3 demonstrates that there are differences in the reasons given for leaving between mature students and seventeen to twenty one year olds. The vast majority of total attrition relates to students under the age of 31 which is likely to simply be representative of the demographic of the dataset (84% of the total students were under 31). However, it is notable that all students leaving for financial reasons were mature (over 37 years of age according to raw data) and the majority of students leaving for reasons that might be considered 'changing their minds' i.e. transfer programme and being unsuited to the course are in the seventeen to twenty one age group. Approximately twice as many mature students left for personal reasons compared to seventeen to twenty one year olds and academic failure was more prevalent amongst seventeen to twenty one year olds than mature students.

Figure 4. Proportion of attrition for each reason for students within each entry qualification category.

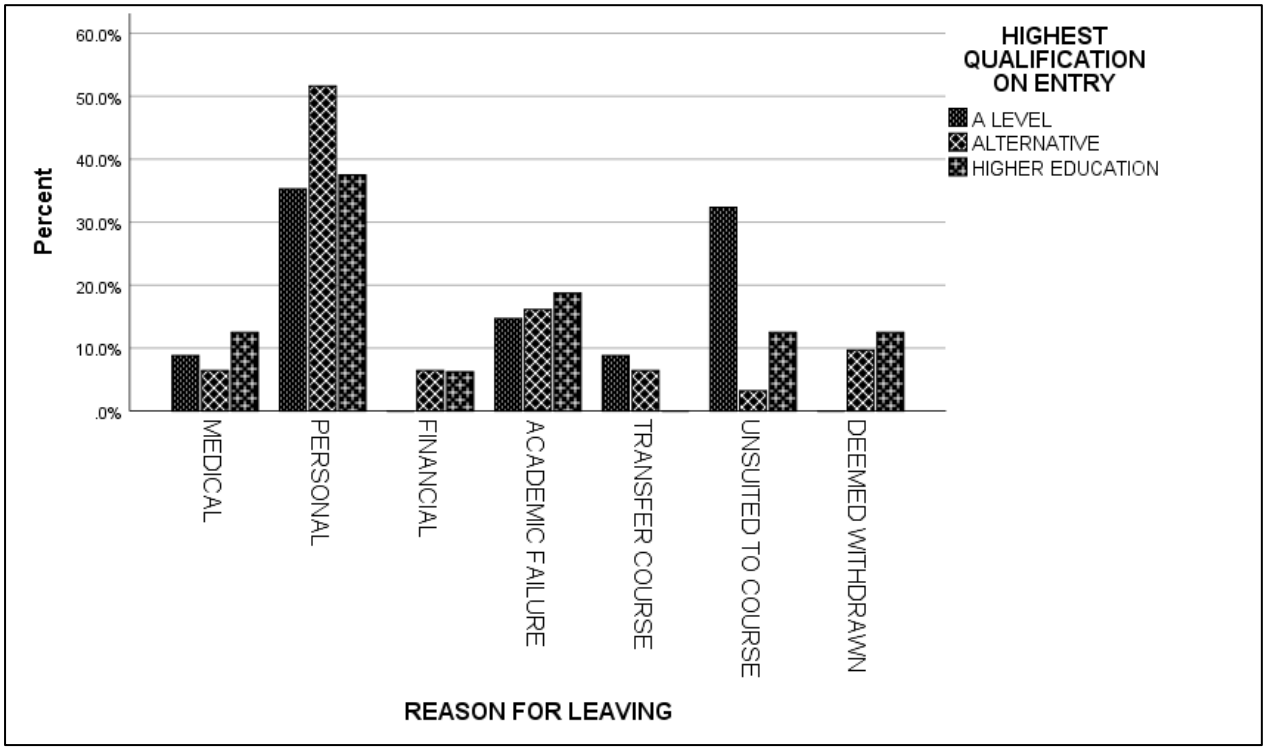


Figure 4 shows that the highest percentage of withdrawals was by students with alternative qualifications and for personal reasons and the majority of students leaving due to being unsuited to the course held A level qualifications.

Figure 5. Proportion of attrition for each reason by students with differing academic performance.

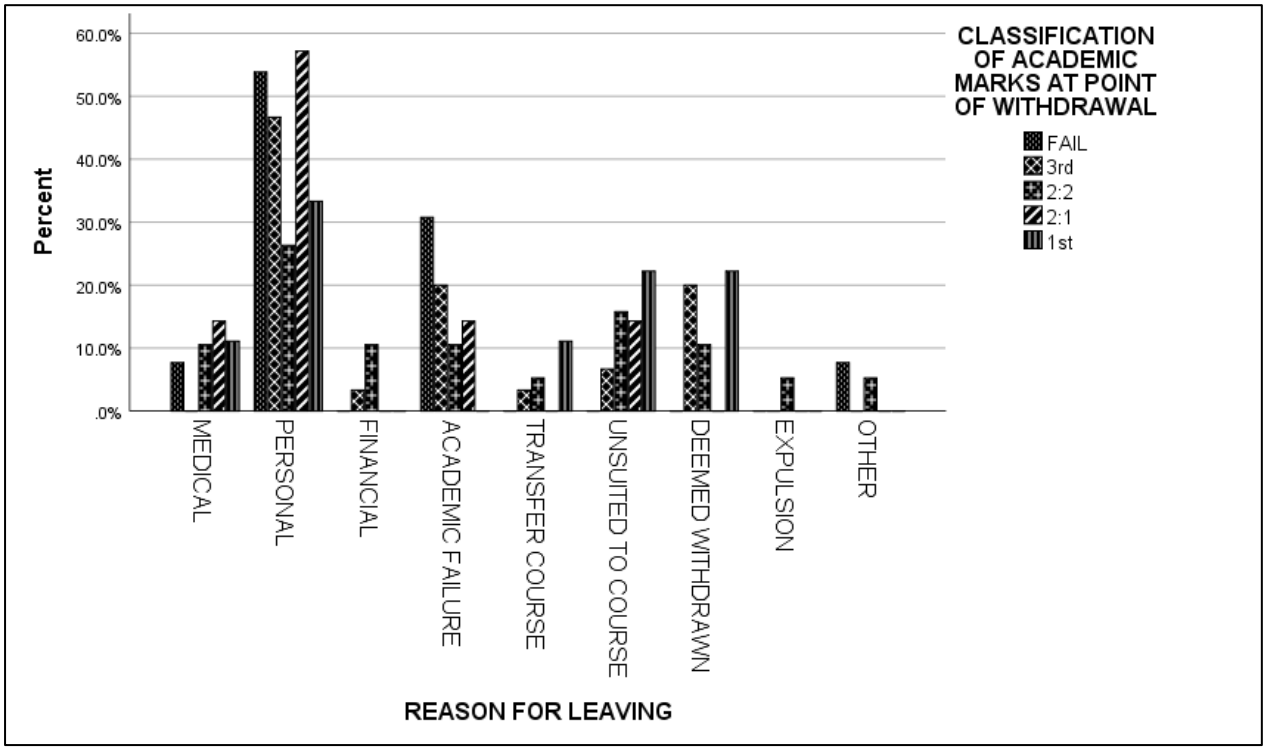


Figure 5 demonstrates that the highest proportion of withdrawals was by students achieving in the upper second class range of marks or failing and for personal reasons. Not all students leaving due to academic failure had been performing poorly.

4.1.5 Interpretation of results from phase 1

The peak time for withdrawal coincided with the end of an academic year. Academic failure may be confirmed at this stage and there is also the possibility that students experiencing difficulties may voluntarily withdraw at this time either to pre-empt being withdrawn due to academic failure or having made the decision to persevere until the end of the year and in both cases, cite personal or other reasons for their withdrawal rather than academic failure. As the majority of withdrawals occurred during academic stages of the programmes, this suggests that academic years probably end with academic blocks (which could be explained by end of year examinations).

It is without doubt that significant differences existed between completers and non-completers with regards to their age, entry qualification and academic performance according to these data. Students who failed to complete their courses were significantly older than those who completed. Students without A-levels were greatly over-represented amongst non-completers. It should be noted that 80% students holding non-A level entry qualifications were mature.

From the ORs it can be estimated that every year older a student is when they begin the course, the odds of their completion reduces by approximately 8% and with every mark increase in the average score, the odds of completion increases by approximately 18%. It must be acknowledged that poor academic performance may be a symptom of wider issues and not solely due to academic ability.

From the analyses of these data it can be concluded that completion outcomes were different for students based on their age, entry qualifications and academic performance, however, these differing outcomes can only be considered as being influenced by the characteristics in the cases of age on entry and academic performance. It appears likely that the reduced completion outcomes for students holding non-A level entry qualifications may have been due to their age rather than the qualifications; 88% A-level entrants were under twenty one years of age and 80% non-A level entrants were mature.

Regarding the reasons given by students for leaving, there is a trend identified amongst students holding A-level qualifications (88% of whom were under twenty one years of age on entry) and withdrawing due to unsuitability of the course. This may potentially be attributed to a lack of knowledge about of the career or the demands of the course in students entering the course without relevant awareness or experience i.e. straight from school or college. Overwhelmingly the most prevalent reason is 'personal' and it is acknowledged that there is a lack of understanding regarding the meaning of personal reasons. Students holding alternative entry qualifications, failing academically or performing in the upper second class level all showed the greatest number of withdrawals for this reason. Therefore no relationship is assumed between personal difficulties and other characteristics.

It is possible that students who are struggling academically and have personal difficulties may choose the latter as the reason to leave rather than risk or encounter failure; however this is unlikely to be the case for academically strong students, so there is a possibility that the underlying causes of attrition differ between these groups of students.

It was anticipated that phase two of the study would provide further understanding of these results.

4.2 Phase Two; qualitative survey

This phase of the study explored the experiences and perceptions of student radiographers nationally via an online survey. Its purpose was to improve understanding of the difficulties faced by student radiographers with different characteristics and provide some explanation of the findings from phase one of the study.

4.2.1 Overview of data

186 responses were received; this was estimated to represent approximately 5% of the total population of student diagnostic radiographers.[4] All respondents confirmed themselves as being currently registered student diagnostic radiographers and all provided the required consent to participate. The characteristics of the respondents are shown in table 6. P values are from tests for differences between the phase one and phase two datasets in terms of each of the characteristics.

Table 6: Characteristics of respondents. ¤ denotes chi-square test, § denotes Mann-Whitney test

Characteristic		Participants	p value
Age	median (IQR)	21 (18-29)	0.6 §
	17-21, n (%)	97 (51)	
	Mature, n (%)	89 (49)	
Entry qualification, n (%)	A level	76 (41)	<0.005 ¤
	Alternative	87 (47)	
	Higher	23 (12)	
Year of programme, n (%)	1	64 (34)	
	2	67 (36)	
	3	54 (29)	
	4	1 (0.5)	

As the number of students in each year of a programme is likely to reduce due to attrition, this dataset was felt to appropriately represent the populations across each stage. Examination of the data revealed one student who was no longer a student radiographer but had transferred to a different programme. However, the comments provided remained relevant and so the response was included for content analysis.

The free text responses were variable in their volume and complexity. Word counts per participant ranged from two to 746 across the questions asked. The mean number of words per participant was 80.

A-level was the majority qualification in phase one and alternative qualification the majority in phase two.

One hundred and one respondents (54%) indicated that they had considered giving up their degrees at some point with only ten stating a single reason for this; all others provided multiple reasons. The frequencies of reasons given are shown in table 7.

Table 7. Frequencies of reasons given by students for considering giving up their degrees.

Reason for considering leaving	**n (%)**
Academic difficulty	44 (17)
Financial	43 (16)
Personal	43 (16)
Dissatisfaction with clinical placements	35 (13)
Health	34 (13)
Dissatisfaction with course	30 (11)
Wrong career choice	18 (7)
Other	13 (5)

4.2.2 Content analysis of qualitative responses

The data were exported into a MS Excel ® spreadsheet (Appendix 6) then grouped according to the characteristics identified as significant in phase one i.e. age and entry qualification. The grouped responses were analysed using content analysis as described in Chapter 3 [124] to identify emergent themes. The codes allocated were; Tiredness, Independent learning, Clinical-academic balance (hours), Negative experience with radiographers, Patients, Academic writing, Academic difficulty/level, Loneliness, Fitting in, Academic assessment, Leaving home/independent living, Missing out on student life, Mature student issues, Carer responsibilities, Revision, Placement hours, Loss of income, Working alongside degree, Financial pressure, Health, Stress, Asking for help, Placements (distance/travel), Placement integration, Placement learning/competency, Feeling unprepared, Different from school, Theory-practice gap, Lack of support from university, Short holidays, Work-life balance, Returning to being a student, Understanding relevance of degree, Relationships with lecturers, Meeting professional standards, Commuting, Working for free.

An illustration of the categorisation and emergent themes is demonstrated in table 8:

Table 8: Illustration of themes from content analysis

Tiredness Placement hours Working alongside degree Work-life balance	Independent learning Academic writing Academic level/difficulty Academic assessment Revision Relevance of degree	Loneliness Fitting in Leaving home/ independent living Feeling unprepared Different from school Relationships with lecturers Meeting professional standards	Negative experience with radiographers Patients Missing out on student life Placements – distance/ travel Placement integration Placement learning/ competency Short holidays Working for free	Loss of income Mature student issues Carer responsibilities Returning to being a student Financial pressure Commuting	Ill Health Stress Asking for help
					
WORKLOAD	**ACADEMIC DIFFICULTY**	**ADJUSTING TO UNIVERSITY**	**POOR CLINICAL PLACEMENT EXPERIENCE**	**BEING A MATURE STUDENT**	**HEALTH**

The frequencies of these themes together with the proportion of students commenting within the themes that had considered leaving are presented in table 9.

Table 9. Frequencies of themes in responses

Theme	Number of comments (meaning units)	Number of students commenting within theme that had considered leaving, n, (% of commenters)
Workload	66	36 (55)
Academic difficulty	32	11 (34)
Adjusting to university	58	33 (57)
Poor clinical placement experience	69	40 (58)
Being a mature student	51	31 (61)
Health	39	37 (95)

Descriptive statistics and content analyses are presented and discussed within the following sections.

4.2.2.1 Workload

As shown in table 9, a total of sixty six comments related to workload, making it one of the most prevalent challenges identified. Over half of these students had considered leaving.

62% comments came from seventeen to twenty one year olds. When the comments were analysed by age group, 49% seventeen to twenty one year olds had considered leaving compared with 70% mature students. All reasons were given by at least one student, with personal and academic difficulty being the most common. Dissatisfaction with the course, dissatisfaction with clinical placements and wrong career choice were far more prevalent amongst seventeen to twenty one year olds than mature students; financial difficulties were more prevalent for mature students. For the other reasons, there was little difference noted between the age groups. Academic difficulty was selected sixteen times as a reason that withdrawal had been

considered but no students made any reference in their comments to the academic level being too difficult; all mentioned the volume being too great in the time available. This suggests that the level of the academic work is not the only reason that students struggle academically; volume of workload is also perceived as an academic difficulty and failure to manage this could lead to academic failure.

When considered by entry qualification categories, 44% of the comments were from students with A levels, 37% from students with alternative qualifications and 10% from students with higher education qualifications. Of these, 44% of the students with A levels had considered leaving compared with 63% students with alternative qualifications and 86% students with higher education qualifications. This suggests that excessive workload is identified as a greater issue for students entering with A level qualifications than others but could be more likely to be a factor in attrition for students with alternative and higher education qualifications. The reasons given for having considered leaving varied across the qualification categories: students with A levels were more inclined to choose dissatisfaction with the course or placements than the other students; students with alternative qualifications were most often selecting financial or academic difficulty whilst those with higher education qualifications chose personal, academic difficulty and financial difficulty equally.

A number of students mentioned struggling to manage academic work alongside clinical placements but this was primarily identified as a challenge during progression rather than transition.

> *"Assessments at placement and university and trying to make all the deadlines."* (Participant 4)
>
> *"The volume of content taught at uni [sic] is difficult to balance with social life, and when on placement it's hard to find the time to do uni [sic] work."* (Participant 8)
>
> *"Juggling the number of modules and assignments while also on placement. It's a great deal of stress, and I believe placement should run alone with students just completing their portfolio and appraisals. Especially in hospitals that students work shifts."* (Participant 167)
>
> *"Balancing exams, assignments, and placement, while still finding time for personal life."* (Participant 133)
>
> *"Time management to balance placement and other university work has always been a challenge. It can get stressful at times."* (Participant 165)

The comments relating to the strategies used to overcome this challenge along with the fact that they were still enrolled suggested that students did find a way, with improving their organisation being commonly mentioned;

> *"Being proactive with work to prevent it building up."* (Participant 2),
>
> *"Revision timetables and planning when I would get what work done."* (Participant 106),
>
> *"…constant revision. Pre reading and consistent revision daily of lecture notes and post reading. Talking to lecturers and other students if I didn't understand what happened in lecture..."* (Participant 107).

Several students also acknowledged the support received from others including family, friends, academic staff and professionals such as therapists.

> *"My amazing partner who encouraged me to work less and paid more of the household expenses…"* (Participant 78),
>
> *"Talking to peers on my course…"* (Participant 2),
>
> *"…making friends who were quite supportive."* (Participant 94),
>
> *"Great tutorial support at [my] Uni. Absolutely amazing at helping me when I had a question regarding assignments… …Extra sessions booked in x-ray room with peers and lecturers were willing to help. Seeing the lecturers were happy and eager to help made me realise I am OK to be a student and not know things and that's why I need to ask and come out of my shell."* (Participant 107)

However on the subject of mental support participant 107 also stated,

> *"I cope, I guess by talking about it to peers. Never to lecturers. I don't know how I would approach a lecturer or anyone professional at campus to say I am struggling mentally as I think they would have taken me on for my mental capability or strength."*

4.2.2.2 Academic difficulty

Academic failure was the second most common cause of attrition from the phase one data. The comments were examined for insight into what students struggled with regarding the academic elements of their programmes. In terms of subjects, science was the only one specifically mentioned with ten comments indicating that

the physics and/or radiographic sciences were considered difficult due to having no background in these subjects. Of these, five students had considered leaving and four of these chose academic difficulty as one of the reasons. The other reasons given were personal, financial, dissatisfaction with course and dissatisfaction with clinical placements. One student in each age group selected academic difficulty as their sole reason for having considered leaving; all of the others had selected multiple reasons. Five of these comments were from mature students and five from seventeen to twenty one year olds. Three of the mature students had considered leaving compared with two of the seventeen to twenty one year olds suggesting that neither age group felt more challenged than the other by the academic level of the course.

Academic difficulty relating to subject matter was twice as prevalent in the comments from students with alternative and higher education qualifications than those with A levels but the challenges were the same as demonstrated in the quotes below. The same proportion of A level and alternative qualification students had considered leaving. Participant 101 had previously completed a science degree yet still found the level difficult and had considered leaving.

> *"The academics!! [sic]. Hugely physics based which isn't a strong point of mine!"* (Participant 28, aged 21, alternative qualification),
>
> *"I think it would have been my lack of knowledge in physics, my access to higher education course did not include any physics and I had no past experience of physics whatsoever."* (Participant 85, aged 39, alternative qualification),
>
> *"The physics aspect was difficult as I had not done it since GCSE level."* (Participant 101, aged 22, higher education qualification.)
>
> *"I had not studied physics at A levels and although the physics is not too difficult I still found it hard to understand some of the concepts in the radiographic science module…"* (Participant 32, aged 20, A levels),

Despite this perceived difficulty, with self-study and support from peers and academic staff, students remained enrolled:

> *"I still struggle but lecturers are generally very helpful!"* (Participant 28),
>
> *"Going through each new topic and drawing explanations helped me to understand the topics better."* (Participant 32),

> *"Revision, pals (peer assisted learning) sessions greatly helped."* (Participant 43),
>
> *"I spoke with other students and those in the year ahead. They gave advice and material such as books to help us understand."* (Participant 101).

However, one student provided a strongly worded statement indicating that the relevance of the science and much of the academic content was not well understood:

> *"…shortfall of the skills that are needed to be a competent radiographer instead of learning the content of a degree that all hospital staff think is not required… I feel ill prepared, having studied subjects that are not needed in the real job role of radiography…."* (Participant 72).

Twenty two further responses identified lack of academic writing skills and difficulty in developing these as a major challenge. Thirteen of these comments were made by seventeen to twenty one year olds compared with nine from mature students. Four of the seventeen to twenty one year olds had considered leaving, of which three had selected academic difficulty as one of the reasons. Two of the mature students had considered leaving but neither had included academic difficulty as a reason for this. This suggests that academic writing might be perceived as a greater challenge by the seventeen to twenty one age groups than by mature students.

When considered by entry qualifications, there were the same number of comments (eleven) from students with A levels and students with alternative qualifications. However, only one response of this kind came from a student with a higher education qualification suggesting that this may be a general challenge for all students transitioning into higher education. Twice as many (four) students with alternative qualifications as A levels had considered leaving however academic difficulty was not given by all as a reason.

It was clear that several of these students did not feel well-prepared for academic writing at the level required of their programmes:

"Finding and using literature for the assignments, I had never referenced anything before." (Participant 125, aged 18, A levels),

"Learning how to structure assignments and reference after doing just exams for years with GCSE and A Levels." (Participant 141, aged 18, A levels),

"My Academic skills were non-existent before completing the access course, I have found essay writing and research difficult to learn." (Participant 145, aged 42, alternative qualification),

"I came from a BTEC background. The most surprising thing for me and probably the toughest was for me to get a grasp of academic writing. My BTEC course was assignment based and I came out with distinctions across the board. However, when it came to my 1st assignment towards the end of 1st year I got a massive shock..." (Participant 146, aged 19, alternative qualification),

"Learning how to write academically and reference as I did not need to in college." (Participant 168, aged 22, A levels)

"Coming straight from school and having done science and maths at A level- I found the skill of academic writing quite difficult, particularly as I had not written an essay since G.C.S.E." (Participant 178, aged 18, A levels)

"The essay writing as I hadn't done any literature based education since GCSEs." (Participant 41, aged 18, A levels)

For some, this challenge persisted throughout their programmes;

"The assignments, I had never done many pieces of coursework or assignments, I did exams and this is how I got used to being assessed." (Participant 125)

"See last answer. Simply developing enough academic skills to pass the degree has been the challenge. Understanding critical evaluation, learning how to research a topic and communicating my findings are all things that I have struggled with." (Participant 145)

"Still the essay writing as I don't have the best skills for literature." (Participant 41)

Again, students sought support from others, primarily friends and academic staff. With regards to academic support, feedback was particularly appreciated along with additional resources such as peer support, workshops and programme specific online learning.

"Feedback from assignments and blog writing gave me a better understanding of what they are looking for." (Participant 155),

"Talking to lecturers helped me to gain skills in communicating with staff while on placement. In terms of academic writing- again taking on advice from lecturers as well as going to library workshops and online workshops." (Participant 178)

"Access to academic support via the breakfast club…" (Participant 66),

"Talking to others about how they find literature and reference it." (Participant 125)

4.2.2.3 Adjusting to university

When analysed by age group, 71% comments came from seventeen to twenty one year olds. 50% of the mature students had considered leaving compared with 58% of the seventeen to twenty one year olds. The reasons given were varied. For the seventeen to twenty one year olds, all reasons were selected by at least one student but personal and academic reasons were most prevalent with twelve comments for each followed by health and financial reasons with nine comments each. For mature students, wrong career choice and dissatisfaction with course did not feature; personal reasons were the most common with six comments, closely followed by health and financial reasons with five and four comments respectively. For the seventeen to twenty one year olds, comments included programme related issues such as feeling unprepared, academic issues such as adjusting to different ways of learning/assessment and social issues such as adjusting to independent living and loneliness.

"Living by myself, cooking and exam revision." (Participant 16, aged 21)

"Moving away from home and sorting out my finances in order to support my studies" (Participant 24, aged 19)

"Juggling placement and all University responsibilities such as exams and domesticated things like cooking and washing" (Participant 62, aged 19)

"It was difficult to be responsible for your learning 100%, there is no one at university who will chase things up and constantly remind you about deadlines." (Participant 81, aged 19)

"The independence and jump between 6th form & 1st year" (Participant 148, aged 18)

Two students commented on their lack of experience and lack of understanding of the profession of radiography but neither had considered leaving;

"I think understanding the nature of the profession as a whole. I only really understood our roles during a second year placement. Therefore, placement was the suggest [sic] *factor in overcoming this."* (Participant 153, aged 18)

"I had no previous Healthcare experience except for my work experience prior to the course. This meant I was quite underconfident [sic] when going out in practice." (Participant 165, aged 18)

Another two commented on the expectations of professionalism associated with their programmes;

"expectations of the level of professionalism in and outside of university). The pressure of those expectations was the challenge. (Participant 77, aged 18)

"The idea of being a 'professional' and the idea of a wide community of healthcare professionals with so much knowledge was very intimidating and I was very unsure if I would ever be able to reach 'their level' (Participant 110, aged 19)

For mature students, academic aspects of returning to education and adjusting from being a 'worker' to being a 'learner' in an unfamiliar environment along with fear of not fitting in with younger students were mentioned.

"Going from a full time job where I was training students, to being a student knowing nothing about what I was doing." (Participant 65, aged 23)

"Teaching myself how I learn again" (Participant 75, aged 27)

"Having been in the field of teaching prior to commencing my radiography degree, the biggest challenge was becoming a student again… there was also the fear of not fitting in with the younger students." (Participant 104, aged 37)

"The biggest challenge I felt was actually engaging in a student environment with a difference. It was a student environment yet were treated as responsible professionals… the mindframe I had prepared for was to be a

"student" yet this career seems to hold a trend even as students that we are "professionals " the second we start on this course. I found this difficult…(Participant 22, aged 29)

When compared by entry qualifications, 50% students with A levels commented on difficulties adjusting to university compared with 16% those with alternative qualifications and 26% students with higher education qualifications. However, the greatest percentage of students that had considered leaving was those with alternative qualifications (64% compared to 50% with A level and 33% with higher education qualifications). This suggests that although this may be a more common challenge for A level students, it may be more likely to be a factor in attrition for students with alternative qualifications.

Personal reasons and academic difficulty were the most commonly given reasons for considering leaving by students with A levels, academic difficulty and health by students with alternative qualifications and financial by students with higher education qualifications. All reasons were selected by at least five of the students with A levels; wrong career choice, dissatisfaction with placements and dissatisfaction with course were not selected by any students with alternative qualifications; wrong career choice, academic difficulty and dissatisfaction with course were not selected by any students with higher education qualifications. These patterns are similar to those seen when the age groups were compared with the responses from students with A levels looking similar to those from seventeen to twenty one year olds and comments from students with alternative and higher education qualifications looking similar to those from mature students. It may be that adjustment to university is more an age related issue than an academic background issue.

4.2.2.4 Poor clinical placement experience

This was the most prevalent theme in the comments. Many of these comments related to difficulties balancing clinical and academic workloads; of the forty students

who had identified this as their greatest challenge and considered leaving, twenty four had included dissatisfaction with clinical placements as either the sole or one of the reasons for this. Five students selected this as the sole reason, the greatest number of responses for a single reason.

48% comments came from students with A level qualifications, 38% from those with alternative and 14% from students with higher education qualifications. 73% students with alternative qualifications had considered leaving compared to 55% with A levels and 40% with higher education qualifications. Equal numbers of students with A level and alternative qualifications chose wrong career choice as one of the reasons for having considered leaving. This was surprising as many of the students with alternative qualifications had studied courses specifically for entry into healthcare professions or radiography; it would be anticipated that these students may have been better informed about the career before making this commitment than students with A levels who may have made this career decision after choosing subjects. It is therefore possible that these students may have had expectations which were not fulfilled. Aside from this issue, the comments by qualification category were largely similar to the comments by age group where seventeen to twenty one year olds were primarily students with A level qualifications and all students with higher education qualifications and the majority of students with alternative qualifications were mature. The issues highlighted by these age groups (and indirectly, qualification categories) are now discussed.

56% of the comments were made by seventeen to twenty one year olds compared with 44% by mature students. This is approximately reflective of the age group proportions within the dataset so suggests that challenges relating to clinical placements are no more significant for either group. 56% of the seventeen to twenty one year olds had considered leaving compared with 64% of the mature students suggesting that poor clinical placement experience may be slightly more influential for mature students in terms of discontinuation decisions.

Multiple aspects of placements were mentioned by both age groups including travel/distance, isolation, long hours leading to tiredness and lack of opportunity to earn money, financial costs associated with placements e.g. additional childcare/accommodation/travel, difficulty in dealing with patients, dissatisfaction with

having to move away from university to attend placement, lack of time for academic work and poor support from clinical and academic staff. For the seventeen to twenty one year olds, missing out on 'traditional student life' was mentioned. In addition, for this age group, six students had selected wrong career choice as a reason for considering leaving compared to two mature students suggesting that the career expectations for this younger age group may not be as well-established as those of the mature students. Two further comments suggested that these students believed they should be paid for their work during clinical placements; this was not mentioned by any of the mature students. Several students from both age groups commented on poor experiences with the radiographers or clinical staff that they worked with;

> *"Radiographers don't always appreciate that you are there to learn (see you more of a pair of hands that they can shift their workload onto).This can be really challenging."* (Participant 159, aged 22)

> *"Being treated like an inconvenience on placement. Some qualified radiographers are incredibly rude and condescending to students."* (Participant 97, aged 36)

> *"Settling into the hospital environment on placement when dealing with difficult staff members"* (Participant 167, aged 18)

> *"I also did not feel welcomed in general by the majority of the radiography profession. I appreciate the strain and stress that comes with the job due to the issues within the NHS currently, however I was not inspired or enthused to join the career. I actively felt that I was given more 'advice' dissuading me from the career, which I found really difficult considering I was unsure already."* (Participant 35, aged 20)

> *"…and the radiographers in practice not being receptive to students"* (Participant 38, aged 18)

> *"Placement - handling negative behaviour of some qualified radiographers towards students. Fear of raising issues for potential effect on future career."* (Participant 67, aged 45)

> *"Conduct of radiographers on placement - Many unwilling to offer constructive help, abandon you. Just rude generally… Those who will help the most tend to be newly qualified, those who didn't tended to be those who had been qualified for 5 years or more."* (Participant 68, aged 39)

> *"a small but significant majority of clinical staff on placement made it a very alienating experience, through 'cliques', department culture, poor management, poor organisation, and general lack of interest in students, to the point where I'm not sure I want to complete the degree."* (Participant 102, aged 28)

Participant 102 expressed dissatisfaction with the manner in which their concerns were addressed;

> *"staff attitude on clinical placement may not be overcome, as university staff have largely said 'that's just the way it is'."*

The coping strategy for participant 167 demonstrated determination in spite of a poor experience;

> *"Just keep trying to be proactive and not lose hope even if they didn't want to interact with you"*

Participant 67 gave a troubling coping strategy,

> *"…put bullying into perspective."*

Participant 35 claimed to have left clinical placement as they felt they were;

> *"becoming miserable, unhappy and a shell of who I was before."*

When examining the full responses from this student, it states that an alternate route to completing a degree was provided by their university.

However, members of clinical staff were recognised as a source of positive support by others:

> *"Having a member of staff on practice that you could work with, learn from and ask silly questions to was so helpful. It let me learn without having to learn through mistakes."* (Participant 169)
>
> *"Lovely people on placement site,"* (Participant 138)
>
> *"Placement is where you get the most support"* (Participant 56)

Two students demonstrated the use of strategic selection of clinical staff that they worked with;

"Placement is easier in second year because you know the radiographers that help students and you can pick and choose a bit more," (Participant 97)

*"Specific radiographers can *sometimes* be avoided"* (Participant 38)

From these comments it appears that clinical staff may be influential in students' decisions to continue or withdraw. Participant 97's comment encapsulated this;

"Placement can be either totally amazing or totally awful depending on the rota. Certain radiographers or departments can leave you thinking "why am I doing this?" I remind myself it's just a day or a week and to remember not to be like that when I'm qualified. Or that I wouldn't work in that department."

Students also indicated that they struggled to adapt to the differing techniques and the different expectations of the clinical staff that they worked with and identified a theory-practice gap between what they learned at university and what they saw in clinical practice.

"Uni [sic] doesn't adequately prepare students for placement experience, either in skill or expectation. I have spent 3 placements listening to superintendents down to band 5's all stating the university does not provide us (as a student population) with the skills or knowledge they want to see, this breeds resentment in the teams we are supposed to be imbedded within and inhibits our learning." (Participant 68)

"Working with radiographers who work differently to how we as students are taught." (Participant 27)

Participant 68 dealt with this by;

"Do the hours, try to pick up what you can on placement" and Participant 27 resorted to;

"Working the way we are taught as students"

However, participant 50 appeared to embrace the variability;

"Continually improved techniques by gaining advice from lecturers and clinical staff/tutor"

Other staff members including clinical tutors, practice educators and academics were identified as a source of support during clinical placements;

> *"Having a clinical tutor who is very approachable, and friendly. I feel I could speak to her about any of these issues if they became too great a problem. Having an academic advisor at uni who is also very approachable, helpful etc."* (Participant 7)
>
> *"Continually improved techniques by gaining advice from lecturers and clinical staff/tutor"* (Participant 50)
>
> *"The university held workshops on resilience and emotional intelligence among other things, these helped prepare me."* (Participant 87)

Participant 56 reported being let down by academic staff;

> *"Our lecturer that was meant to visit to have one to one meetings has not bothered with this during all three of my placements."*

It seems that there is a need for dialogue between universities and clinical departments whereby issues such as these can be discussed and potentially addressed through a collaborative approach. Acceptance of poor student experience is unlikely to assist in maximising retention.

4.2.2.5 Health

Although health was one of the least prevalent themes, it is notable that, as shown in table 9, 95% students who had mentioned their health had considered leaving. 54% of the comments were from mature students compared with 46% from seventeen to twenty one year olds demonstrating a slight over-representation of mature students. This is likely to represent the prevalence of ill health in the general population according to age. Twenty one of the forty comments came from students with alternative qualifications compared with sixteen from students with A levels and three with higher education qualifications. Therefore within this data subset a slight over-representation of students with alternative qualifications was noted but the earlier

analysis demonstrated that students holding these were generally older than those with A levels and therefore no significance is drawn from this observation. Fourteen of the sixteen students holding A level qualifications had considered leaving; all students from the other categories had. In addition to health, the most prevalent reasons for this varied across the categories; for students with A levels, it was personal reasons, for students with alternative qualifications, personal, academic difficulty and financial and for students with higher education qualifications, personal and financial. Again, the split appeared to be age related more so than qualification related.

Only one student from each age group had not considered leaving. With the exception of two, all students cited multiple reasons for having considered leaving with health amongst these. These two students were from different age groups and qualification categories and both gave health as the sole reason for considering leaving. However, neither mentioned their health in their qualitative comments.

> *"Lack of / less money, traveling/commuting, childcare, making time to study at home/ revise effectively."* (Participant 40, aged 29, alternative qualification)

> *"Transitioning to working in a busy hospital environment with staff I did not know. Getting clinical competencies signed off due to confidence in asking staff as well as some staff not being willing to sign any competencies of for anyone."* (Participant 105, aged 19, A levels)

For the majority of respondents, the issue of health appeared to be secondary to other issues; for mature students the impact of financial difficulties and caring responsibilities on health was the most prevalent and for seventeen to twenty one year olds, the impact of transitioning into university and managing workload. This is reflected also in the qualification categories where the seventeen to twenty one age group looked very similar to the A level category and the alternative and higher education categories combined looked similar to the mature student category.

Participants 7, 34 and 107 mentioned health conditions in their comments but did not include health as one of their reasons for considering leaving:

> *"I struggled to fit in anywhere. I also found it a challenge to work in a hospital for the first time…I have seen a therapist, but that was my own initiative, due to NHS waiting lists and wanting something more comprehensive/long-term. I*

have tried to feel more at ease at the hospital, by being a bit easier on myself (mentally) and trying not to 'overthink' whether I am doing well, whether people like me etc." (Participant 7)

"I don't know how I would approach a lecturer or anyone professional at campus to say I am struggling mentally as I think they would have taken me on for my mental capability or strength." (Participant 107)

Exhaustion was mentioned by 2 students (participants 68 and 131) who had both considered leaving.

Few comments appeared to relate to physical health. Participant 81 mentioned strain on their physical and mental health and participants 102 and 104 provided comments that may have been related to physical health;

"Unfortunately at the end of the second year I became quite ill and was diagnosed with a few illnesses. This limited my ability to work at the speed I was used to in my assignments as well as on placement. I had to take time off…" (Participant 104)

"I had health problems…" (Participant 102)

Participants 81, 102 and 104 had all considered leaving.

All other comments that explicitly mentioned health related to mental health:

"Attending university has caused a relapse in my mental health…" (Participant 74),

"I think the load of work can be overwhelming. The combination of placement and university time, created a lot of pressure on my physical and mental health." (Participant 81)

"The mental aspect related to coping with uni and personal life is I think something unmeasurable which as a student radiographer I was not prepared for and I thought I was a mentally stable person." (Participant 107)

"Anxiety, Depression, Health issues, Low self-esteem" (Participant 109)

"I suffer from panic attacks." (Participant 153)

"The lack of support in terms of mental health. Including resilience and support whilst on placement." (Participant 154)

"I've struggled with my mental health and I didn't have a very good outlook." (Participant 174)

With the exception of participants 107 and 153, all had considered leaving. Participant 153 had not considered leaving and stated the following strategy:

> *"After the first placement I felt really comfortable as they had put an access plan in place in case I did have a panic attack. This support from both the uni and from staff in practice allowed me to develop as a radiographer while being mindful of self-care."*

However, seventeen respondents provided no information to explain the inclusion of health as a reason for considering leaving. The comments from these students included; financial issues, childcare and parental difficulties, academic difficulties, excessive workload, difficulty with motivation during clinical placements, placement-related problems and returning to study. This raises the possibility that some students who leave for health reasons may not do so because of an identified health condition but when other pressures become too great, they consider their health to be at risk. As suggested by Glossop they may consider ill health to be a more acceptable reason for leaving that feeling unable to cope. [75]

In summary, it appears that the greatest health issue facing all student radiographers is that of poor mental health and that external factors are influential in this. There is a suggestion from these data that for mature students especially, when health is considered to be impacted, withdrawal will definitely be considered.

Whilst there may be little that educators can do to change students' personal or financial circumstances, the issue of workload and its impact on students' mental health may be something that can be managed and may be significant in reducing attrition. Appropriate support both from education providers (including clinical staff) and social/family networks was identified as key in students' decision to remain enrolled. HEI support mentioned included access to wellbeing and/or counselling services, tutor support and being able to talk to other students so facilitation of and clear signposting to these is likely to be helpful.

4.2.2.6 Being a mature student

56% of the mature students had considered leaving compared with 53% of the seventeen to twenty one year olds. Sections 4.2.2.1 to 4.2.2.5 include comparisons between these age groups in terms of the relevant themes.

All mature students who had considered leaving, except two, cited multiple or complex reasons for having considered leaving. There were two powerful comments which illustrated the complexity of their situations;

> "*The change to my life style from being a two night a week factory worker and stay at home mum of three young children with a husband working away to all of my free time being taking up with work experience... It was extremely challenging for myself and my family to adjust to the new routine and miss important celebrations of my children's education at school. Also financially trying to continue to work has been near on impossible but requiring childcare with no financial help so I can attend education and placement. Most weeks pass I do not get one day off. This is mainly placement that does not take our circumstances of life into consideration mainly expecting us to work around them. Which is fine and I understand when employed this would be normal, but we are not paid at the moment and need to work to pay childcare to be on placement. Many times this has been challenging and more so now that I have changed to work long weekends. A forced house move is causing massive problems…and a very poorly dependant [relative]...is causing more strain and pressure and very little free time. These are all issues that make me want to either quit my part time job, my radiography or both."* (Participant 129, aged 33).
>
> *"No money, childcare responsibilities, no connection to other students, loneliness, strain on my relationship, grieving [loss of a relative], anxiety, depression."* (Participant 109, aged 32)

Participant 109 accessed professional help in order to continue whilst participant 129 expressed particular determination to succeed;

> *"No strategies in place, never overcome the issues really other than family just learning to put up with my new way of life. And I have never really adjusted just got on with it as I am that determined after all the bother I have caused to do this degree that I must remain focused as I am nearly there. It's like a constant war with my emotions to not give up even though it's really tough some days you just do want to give up."*

The content analysis showed that every student's experience was different but that there were some common challenges.

During transition into the programme, identified challenges were mostly academic in nature with issues such as returning to education and academic difficulty being mentioned frequently. Three of these responses cited academic difficulty as the sole reason. During progression, the challenges were most commonly placement-related but these were variable in nature. Knowing how to behave, fitting in, long hours, difficult relationships with clinical staff and managing academic work alongside placement were all mentioned.

On observation of the data, it appeared that some issues were more prevalent in students aged twenty six years or above and so the data were compared between students aged twenty two to twenty five and those aged twenty six or over.

For mature students under twenty six years of age (n=25), eleven (44%) had considered leaving. For mature students aged twenty six or over (n=64), forty (62%) had considered leaving.

For the students aged twenty one to twenty five years, the majority of challenges were similar in nature to those identified by the seventeen to twenty one age group therefore the remainder of this section relates to students aged twenty six years or over.

The majority of comments related to external pressures, predominantly family responsibilities and financial pressures. Twenty four (37%) of these had cited financial difficulties amongst the reasons they had considered leaving compared to five (20%) of the under twenty six group. However, in the comments, fewer than half of these students mentioned financial issues as a challenge during transition into their programmes; many more mentioned this as an issue relating to progress. Additional costs such as childcare and travel expenses to attend clinical placements were specifically mentioned. Several of the responses indicated difficulty in adjusting to loss of an income as a result of giving up work to become a student again. These struggles are summarised by two particular comments from students who cited financial difficulties amongst their reasons for considering leaving:

> *"Going from full time work to studying was difficult with regards to money. The student loan is very restrictive and I am unable to work very often due to placement and the amount of studying / attendance required for the course."* (Participant 150),
>
> *"Moving from full time work for 10 years back into education - I tried to do both but realised quickly that wasn't possible. Financial stress has been an issue - have had to rely on my partner financially which wasn't something I had planned to do."* (Participant 74).

It was clear that most of the mature students were willing and trying to support themselves financially and were reluctant to become financially dependent on others. Strategies such as taking on part-time employment, financial support from partners or returning to live with parents in order to manage debt were mentioned as being successful in facilitating their continuation.

Family challenges were also highlighted. These included issues such as having to commute long distances from the family home to attend university and placements and balancing carer responsibilities (financial, practical and emotional) whilst meeting the requirements of their programme;

> *"Before becoming a student I was a full time parent so it was difficult transitioning and balancing child care with a degree."* (Participant 83).
>
> *"Making sure I could still support my family both financially and have ability to meet all my family responsibilities at the same time as doing what was required to for my degree."* (Participant 86),
>
> *"I don't expect any special treatment, I'm a single parent, I gave that very careful consideration when I chose the course, but sometimes I have to put my child's needs first and that doesn't mean I want to be a Radiographer any less."* (Participant 97),
>
> *"Coordinating my studies with increasing carer needs at home, and increased dependence on my being around home, making it difficult when I needed to be at uni starting early and finishing late." (*Participant 88).
>
> *"Organising of family commitments. Because university days varied quite a lot it was very challenging to organise child care to fit in."* Participant 142)

Fitting in was prevalent as a challenge during transition;

"I worried about fitting in with a group of mostly younger people, who are at uni [sic] for the first time. I thought I would feel a bit out of place due to my age…" (Participant 7),

"There was also the fear of not fitting in with the younger students." (Participant 104)

"I was scared I would look like a fool as a mature student." (Participant 107),

"Worry of being a mature student that I would be the only one." (Participant 171),

"As I am a mature student I was worried about my age and how it would affect me making friends." (Participant 150).

These comments suggest that there was an expectation amongst mature students that they would be a minority and that expectations of them might be higher than those placed upon younger students. Despite these initial anxieties, it appears that these students did manage to settle although participant 97 stated;

"…I find the course very tailored to students younger than myself…"

Participants 104 and 150 specifically mentioned making friends as a strategy that had helped them to overcome this challenge whilst participants 97, 104 and 107 highlighted that supportive relationships with academic staff enabled them to cope.

From the comments made about challenges to progress, fitting in no longer featured in terms of being on the programme however fitting in during clinical placements did for two students;

"Adjusting to new departments on a weekly basis- building working relationships with staff." (Participant 78)

"Anxiety around not being good enough/liked on placement" (Participant 53)

From the analysis of these responses, the mature students who responded to the survey were shown to be determined and resourceful in terms of finding ways to manage their numerous challenges; participant 95 admitted to being dishonest in order to achieve approved time off to accommodate external commitments.

It is suggested that students over the age of twenty six when they begin their course are more likely to experience the difficulties associated with attrition than those under twenty six.

4.2.2.7 Entry qualifications

Exploring the relationship between entry qualifications and student retention was one of the recommendations from Williams and Decker's study.[26] The data from phase one of this study suggested that although students entering with alternative qualifications were at the highest risk of attrition of the three qualification categories, the ORs indicated that this was not significant in terms of attrition. Educational background/qualifications did not emerge as one of the themes from the content analysis, however, the responses of all students holding alternative qualifications were analysed and compared to others to explore whether there was any perception that their prior education was disadvantageous. This was not shown to be the case with balance demonstrated in the comments received:

> *"As I had completed an Access to HE course, I feel this degree so far has been easier. I don't feel like I have faced many challenges."* (Participant 25, aged 26).
>
> *"I think it would have been my lack of knowledge in physics, my access to higher education course did not include any physics and I had no past experience of physics whatsoever."* (Participant 85, aged 39).

It was noted that the majority of students holding alternative qualification were mature students and therefore the majority of the comments related to this as discussed previously in this chapter. However, 20% of the responses were not from mature students and the comments from these were compared to those from the mature students. This showed a marked differentiation in the challenges that the two groups perceived. As already described, the mature students predominantly stated external factors such as family commitments, financial difficulties etc. whereas for the younger students, most of the responses related to either academic factors such as workload and level of difficulty or the transition into 'the workplace' i.e. clinical placements or in some cases, both:

> *"Managing the workload and getting used to being in university everyday then going straight into 40 hour/week placement blocks."* (Participant 2, aged 20),
>
> *"Moving into a working environment on clinical placement with paid professionals. I have not had much experience beyond a retail job in the working world and I found this difficult to adjust to as it was fast pace and stressful…"* (Participant 35, aged 20),
>
> *"Placement, working in the hospital environment and communicating with patients. The academic workload compared to college."* (Participant 39, aged 19).

Participant 2 had not considered leaving but participants 35 and 39 had, with both giving multiple reasons.

It is not clear whether the mature students also faced these challenges but did not consider them to be their greatest, or whether the academic aspects were more difficult for the younger students than the mature students.

Although as an overview this differentiation of challenges is noted, it should also be recognised that students holding A-level qualifications also made similar comments;

> *"The practical hours of the job. Going straight from being a student, to effectively a full time worker was quite a challenge".* (Participant 154, aged 19)
>
> *"taking on the practical aspects of placement and joining a team. This was hard as I had no formal experience in a hospital work place prior to my first placement so it was quite a shock to get stuck in and learn, not just the practical bits of doing an x-ray but all the other bits."* (Participant 169, aged 18)
>
> *"Another challenge was being an adult in education and seeing past the teacher student role- particularly on placement when communicating with staff."* (Participant 178, aged 18)

With this acknowledgement, it cannot be assumed that the challenges identified within specific educational groups are unique to that group.

4.2.2.8 Personal difficulties

Whilst personal difficulties were not identified as one of the emergent themes from the content analysis, it was the greatest reason given for attrition in the phase one data. Therefore one of the aims of this project was to gain clearer understanding of what discontinued students might have experienced before withdrawing for personal reasons. The responses of all students who had included 'personal' amongst the reasons for considering leaving were re-analysed to identify any further themes.

63% of these responses came from mature students. 44% of these responses came from students with alternative qualifications. Neither of these proportions are representative of the sample demographics suggesting that personal issues are not experienced more or less frequently by students with 'risk characteristics' for attrition.

On re-analysis, all except three meaning units could be readily categorised and themed into those already identified from the content analysis of the complete dataset. These were:

> *"The idea of being a 'professional' and the idea of a wide community of healthcare professionals with so much knowledge was very intimidating and I was very unsure if I would ever be able to reach 'their level'. The mix of personal/family life/problems and balancing this with such a demanding course."* (Participant 110, aged 19, alternative qualification)
>
> *"Witnessing a child arrest in the resus area, and later pass away"* (Participant 11, aged 31, alternative qualification)
>
> *"Lacking self-confidence. My own expectations."* (Participant 134, aged 56, alternative qualifications)

The remainder of the responses were themed as shown in table 10.

Table 10: Frequency of themes from students stating personal reasons for considering leaving.

Theme	Frequency
Workload	10
Academic Difficulty	16
Adjusting to university	9
Poor clinical placement experience	13
Being a mature student	16
Health	3

This analysis failed to provide clarity around the interpretation of ‘personal reasons’ however, as noted in section 4.2.2.3 difficulty in adjusting to university life may be one of the issues. It is likely that students selecting personal reasons for withdrawal have experienced issues relating to other categories of withdrawal reason.

Chapter 5: Conclusions, discussion and evaluations

5.1 Conclusions and discussion

This study reported an attrition rate of 19%, 5% higher than the latest published UK national figures.[4] From the quantitative data, the following characteristics were identified as risk factors: holding non-A level entry qualifications, poor academic performance whilst enrolled on the programme and being a mature student. The completion rates for all of these groups were significantly worse than for other students. It is important to recognise that whilst age and entry qualifications are pre-existing, unchangeable factors; academic performance remains potentially changeable up until the point of completion or withdrawal. Therefore any experience or factor that may impact the students' academic performance is indirectly a contributor to increased attrition risk.

Estimates produced from logistic regression where these statistically significant characteristics were entered as multiple covariates suggested that the poor completion rates for students with non- A level entry were not due to the qualifications; the majority of students entering with these were mature. Therefore it is likely that this result is misleading for these data and that the reduced completion rate for this group was more likely to be due to the increased ages of the students; it was not possible from this dataset to disentangle age from qualification.

The most common reason given by students for leaving was 'personal' with 45% having given this reason. This is a lower percentage than that reported by Hamshire who found that 80% of nursing and allied health students gave this reason.[131] This study sought to gain some understanding of difficulties that students refer to as 'personal reasons'. The results suggested that 'personal reasons' may include other, defined categories such as academic difficulty or health difficulties in addition to issues such as family or carer responsibilities that might naturally be considered to be personal in nature.

The finding that the majority of student radiographers who left due to having the made the wrong career choice were under the age of 21 when they commenced their programme supports the findings of Kukonnen.[68]

Peak attrition was seen during academic stages rather than placement blocks of the programmes analysed in this study, with the highest rate during year one as is common amongst HE generally.[132] There is suggestion within nursing literature that attrition rates are higher during or immediately after clinical placements [17] but this information is not explicit so is difficult to relate to the findings from this study. This does not provide any evidence to suggest that academic factors are more prevalent than others in students' decisions to leave; just that if this decision is taken, it is most likely to be when the students are in attendance at university. So, whilst student radiographers may not commonly leave during clinical placements, a poor placement experience is still likely to be a factor in attrition. Furthermore, these comments suggest that a good placement experience can be a significant motivation in students' decisions to persist despite other difficulties.

This study does not support the findings of HEFCE, 2013, 2014; Quinn, 2013; Reisel and Brekke, 2010; Severiens and Dam, 2012 as quoted by Bradley [132] which suggested that Social class, gender and ethnic minority status were all factors in increased dropout rates. This study did not gather data on ethnicity but did show that neither gender nor social class were factors in attrition from diagnostic radiography within the study cohort.

The experiences of student radiographers reported in the qualitative survey data were similar to those reported in Hamshire's 2013 study of nursing and allied health students [131] although the percentage of student radiographers in this study reporting having considered leaving was 7% higher than the reported proportion of the students in Hamshire's and between 9% and 14% higher than those surveyed as part of the What Works? programme.[6] Challenges such as academic workload, clinical placement difficulties and personal issues were identified in both this study and Hamshire's however, issues relating to being a mature student are mentioned only briefly in Hamshire's study. Nonetheless, it is suggested in this and other literature that non-academic factors are the primary cause of attrition for this group [76, 111, 133] which is in keeping with the findings from this study.

Data from the qualitative data indicated 51% of students had considered leaving, with the most common reason being academic difficulty. This is not reflected in the frequency of themed comments suggesting that factors other than academic might

feature in students' perception of academic difficulty. The analysis of these comments indicated that the key academic difficulties are excessive workload and difficulty with academic writing. In addition, although not numerous, ten students did identify the scientific aspects of the academic content as being challenging. From previous research into admissions criteria and attrition from radiography education, it is noted that students with higher pre-entry levels of maths and English tended to have improved completion outcomes [61] and this may be relatable to the experiences of the students participating in this study citing academic difficulty; a firm mathematical foundation may be beneficial in terms of scientific understanding and English may assist students with the written requirements of their programmes. These are potentially areas where consideration of admissions criteria, academic support and development or programme design/delivery models could produce improvements in academic performance and reduce attrition due to academic failure.

95% students who had considered leaving stated multiple reasons for this which is in line with the theory of attrition being multi-factorial.[16, 70, 131] However, the data suggest that when a student believes that their health is being compromised, they will almost certainly consider leaving and may well go on to do so. The assumption here is that only students who have considered leaving actually leave but this is probably reasonable.

There was a division in the responses from mature and non-mature students. Again, mature students were faced with significant and often complex challenges; balancing full-time study with clinical placements and external responsibilities/pressures were the greatest issues for this group. For younger students, the challenges were perhaps less complex in nature but nevertheless, significant for them. Academic difficulty and excessive workload were the key challenges identified by these students.

It is not clear from the data whether struggling students were over-represented as participants; this is a possibility that must be considered. However, through comparison of the proportion of students who had considered leaving with current attrition figures, it is likely that many more consider leaving than actually do

5.2 Evaluation and limitations of study

This study provided results which were largely in agreement with existing literature, even though the majority of this literature referred to other healthcare professions suggesting that it is probably appropriate to apply findings from research in other healthcare professions to diagnostic radiography. However, because the dataset for phase one was limited to three HEIs, results may not be widely generalisable; greater participation could have improved this and enabled more confidence in the statistical significance of factors such as the holding of non A-level entry qualifications.

The limited dataset also created challenges in terms of categorising the entry qualifications of students and resulted in categories which were more heterogeneous than initially anticipated. There were several qualifications that were held by only a few students and in order to create groups of sufficient size to enable reliable analysis, it was necessary to group qualifications which may not be comparable. For example, the students with 'higher education' qualifications ranged from those with foundation degrees to those with PhDs (academic levels 5-10). Foundation degrees are fundamentally designed to facilitate access to higher education for students with no formal qualifications and therefore may be offered to students who have failed to meet the normal entry criteria for a BSc; therefore, although the level of the qualification is above the level 3 required for BSc entry, the academic ability of students undertaking this may be lower and therefore may have skewed the results.

From this study, although there was evidence that students holding non A level entry qualifications had a lower completion rates than those with A levels, it was impossible to disentangle the entry qualifications from the students' ages because over 70% of students holding these qualifications were mature.

The student survey yielded rich data, which added compelling insight into the difficulties encountered and often overcome by students.

5.3 Limitations of project

Whilst this project yielded some useful results, there are a number of limitations in terms of the reliability and generalisability of these.

5.3.1 Phase one

The response rate for phase one of the study was very low; just three out 24 HEIs participated. The HEIs that participated did not geographically represent the whole of England. In addition, the types of institutions that participated did not represent all types of institutions offering undergraduate radiography education and therefore there is a risk that sections of the student population may have been omitted from the data. It is possible that sharing the data requested for this study may have been considered commercially sensitive and that HEIs with higher rates of attrition may not have shared data on that basis. In addition, despite most of the heads of programme indicating willingness to participate initially, the majority of them (or their delegated contacts) later responded indicating that they had been prevented from doing so on the basis of data protection.

5.3.2.Phase two

The response rate for phase two was also relatively low and it is possible that the students who participated were those with an existing strong view on their experience to date thus creating bias.

With the occasional exception where students identified their HEI, it is not known how many HEIs are represented in the responses.

Approximately half of the respondents were mature students which is unlikely (though not impossible) to be reflective of the total population of student diagnostic radiographers. This may also have caused some bias in the results.

5.4 Recommendations for further research

It would be beneficial to repeat this study with focus on the characteristics that were identified as being statistically significant. As this study has ruled out some of the potentially sensitive characteristics (social factors, some widening participation characteristics and gender), a dataset comprising of age on entry, entry qualification and whether or not the student completed should protect student anonymity whilst enabling the possibility of disentangling entry qualifications from entry age thus improving understanding. This may improve participation rates in a further study and identify any need for further research into the outcomes of students based on entry qualifications.

The 'alternative qualification' group was where the greatest range of qualifications was identified. It would be beneficial to explore this group further in order to identify whether any of these individual qualifications is disproportionately represented in attrition figures. Anecdotally, it is reported that students entering with BTEC qualifications and some Access to Higher Education qualifications complete less often than others but this study was unable to provide the granularity to support or reject this theory. However, the estimated ORs for completion of students with non A-level entry qualifications were much reduced and a larger dataset would provide greater statistical power and may improve differentiation between some of these individual qualifications.

In order to address the ongoing shortage of diagnostic radiographers, it is vital that any research that might reduce student radiographer attrition is undertaken.

5.5 Recommendations from this study

From the findings of this study, the following recommendations are made and considerations suggested:

- Admissions criteria should ensure that students being accepted onto diagnostic radiography degree programmes possess the level of mathematical/scientific and literary ability required to meet the demands of the

programme; it is suggested that some qualifications, whilst claiming to facilitate access to higher education, do not prepare all students adequately. Educators may consider targeted outreach work with feeder colleges to ensure that these providers are aware of the content and level of programmes that their students go on to apply for. Pre-entry testing of core academic skills may be beneficial.

- Educators should consider provision of additional supportto develop students in the areas they find difficult or underperform . Implementation of active or contextualised learning activities such as peer learning [134] problem solving or case studies may help students to better understand the relevance and importance of the subject matter. With current developments within the profession such as the introduction of assistant practitioners, it is likely that the scope of the radiographer will increasingly shift from being the 'performer of imaging' to being the supervisor/teacher, problem solver and decision maker. In addition, with the increased potential of artificial intelligence to become integral to diagnostic radiography, computing and mathematical skills will likely become more necessary in the future.
- Early and regular formative assessment should be integrated into all undergraduate diagnostic radiography programmes to aid the early detection of and support of students struggling academically. Appropriate remediation should be offered early to ensure that these students do not fall behind and give up or go on to fail.
- Prospective students should be presented with adequate information prior to accepting an admissions offer to ensure full understanding of the realistic demands of the programme. This should include travel requirements and additional costs associated with clinical placements. Whilst there is a risk that this may deter some or lead to deferred entry, in the longer term it could reduce attrition as a result of students being unable to balance the demands of the programme with existing responsibilities.
- For students entering their programme without prior experience in radiography or healthcare, it would beneficial to undertake work experience prior to commencement of study; anecdotally this is reported as being challenging to access but employers are encouraged to facilitate this to ensure maximum

retention of student radiographers and thus maximum output of radiographers to fill their vacancies.

- Pre-entry occupational health screening should require students to declare pre-existing health conditions (including mental health) to aid HEIs in planning or assisting with appropriate support. Students should also be able and required to declare new conditions without fear of negative judgement to enable them to be supported and therefore have the best chance of succeeding.
- Clinical radiographers should be educated in supporting learners and sensitive to the challenges faced by them. They may not realise the impact that they can have on student radiographers; to overcome the current workforce shortage they can be highly influential. Programme leaders and academic staff should recognise the challenges identified in this study. Whilst external factors such as family commitments are outside of HEI control, academic staff can influence workload, provide additional academic and pastoral support, communicate effectively with clinical placement providers to ensure high quality placement learning.
- A more flexible approach to learning e.g. reduced academic attendance requirements with improved online provision may be beneficial in terms of retention for some students who struggle to balance study with external pressures.

With students self-funding tuition fees and additional clinical placement related costs, it is possible that if they do not perceive that they have a good chance of succeeding attrition rates will increase thus exacerbating the ongoing shortage of diagnostic radiographers.

Appendices

UNIVERSITY OF EXETER | MEDICAL SCHOOL

University of Exeter Medical School Research Ethics Committee

Certificate of Ethical Approval

Research Institute/Centre: Institute of Health Research

Title of Project: An investigation into factors influencing student radiographer attrition with a view to the identification of possible predictors for non-completion of training

Name(s) of Project Research Team member(s): Susan McAnulla, Professor Karen Knapp

Project Contact Point: Susan McAnulla

This project has been approved for the period

From: **22 May 2015**

To: **31 December 2016**

University of Exeter Medical School
Research Ethics Committee approval reference: May15/E(ii)/065

Signature: Peta Foxall

Date: 22 May 2015

Name of Chair
Peta Foxall, PhD

Your attention is drawn of the attached paper "Guidance for Researchers when Ethics Committee approval is given", which reminds the researcher of information that needs to be observed when Ethics Committee approval is given.

Application Reference Number 15/02/065

UNIVERSITY OF EXETER | MEDICAL SCHOOL

University of Exeter Medical School
Research Ethics Committee

Certificate of Ethical Approval

Research Institute/Centre: Institute of Health Research

Title of Project: An investigation into factors influencing student radiographer attrition with a view to the identification of possible predictors for non-completion of training – ***Extension of timeframe***

Name(s) of Project Research Team member(s): Susan McAnulla, Professor Karen Knapp, Dr Susan Ball

Project Contact Point: Susan McAnulla

This project has been approved for the period

From: 4 April 2017

To: 31 December 2017

University of Exeter Medical School
Research Ethics Committee approval reference: Apr17/D/065Δ1

Signature: RGarside

Date: 4 April 2017

Name of Chair
Ruth Garside, PhD

Your attention is drawn of the attached paper "Guidance for Researchers when Ethics Committee approval is given", which reminds the researcher of information that needs to be observed when Ethics Committee approval is given.

Application Reference Number 15/02/065Δ1

Appendix 2: Project information form

AN INVESTIGATION INTO FACTORS INFLUENCING ATTRITION BY STUDENT RADIOGRAPHERS WITH A VIEW TO THE IDENTIFICATION OF POSSIBLE PREDICTORS OF ATTRITION

PROJECT INFORMATION SHEET FOR PARTICIPANTS

UEMS REC REFERENCE NUMBER May15/E(ii)/065

Institution Code……..

Invitation

Thank you for showing an interest in this project. Please read this information sheet carefully before deciding whether or not to participate. If you decide to participate we thank you. If you decide not to take part we thank you for considering our request.

As a Higher Education Institution (HEI) providing Radiography education, you are invited to participate in this study investigating whether there are any pre-existing factors that might increase the risk of students failing to complete their programmes of study.

Background to the project

An internal audit undertaken at the University of Exeter raised the possibility that there may be particular student groups at higher risk of attrition than others. The audit analysed entry qualifications and tariff, academic performance, age at entry, gender, ethnicity, widening participation status, socio-economic status and reason given by student for leaving. These data were compared for students that left their courses early with those that completed.

What is the aim of the project?

Having data from just one institution does not provide a reliable representation of the factors influencing student radiographer attrition nationally. It is the intention of this study to provide comparable data for other UK HEIs in an attempt to understand whether there are common factors present for students that fail to complete their programmes as well as for those that complete. The data may also indicate whether there are any 'danger points' for attrition. Through identifying any risk factors, this project aims to make recommendations to mitigate these risks based on existing published research from other professions in the light of the paucity of radiography-related research in this area.

Description of participants required

All UK HEIs providing Radiography education are invited to take part.

What will participants be asked to do?

A pro forma is provided with an identification code for your HEI. Only the researcher undertaking this project will know which code identifies which HEI. Participants are requested to complete this pro forma with data for all students that have undertaken your programme over a period of **five years** (the latest cohort being completers in academic year 2013/14). The data will be provided and remain in a de-identified form and any publications will ensure full anonymity.

Please note: Permission must be sought from the University's data protection/governance officer to share this information.

What is the time commitment for participants?

The data requested may already be available via University planning departments and so the time commitment could vary significantly.

What happens to the data and results?

The data will be stored electronically on a University of Exeter encrypted computer. With your permission it may be re-used for further research into student attrition. The raw data will be analysed for each HEI and these findings returned to you. The data will also be collated and analysed in order to obtain a 'national picture' and these findings will be published and presented. They will also be shared with the South West Local Education and Training Board and may be shared with Health Education England and the College of Radiographers. All data shared will be anonymised.

What if participants have any questions?

If you have any questions about this project, either now or in the future, please feel free to contact either:-

Mrs. Sue McAnulla,
Director of Education
BSc (Hons) Medical Imaging
(Diagnostic Radiography)

University telephone number: 01392 725360
07557 631431 (m)
S.J.McAnulla@exeter.ac.uk

or

Prof. Karen Knapp
Head of Medical Imaging,
BSc (Hons) Medical Imaging
(Diagnostic Radiography)

01392 724133
K.M.Knapp@exeter.ac.uk

Complaints

If you have any complaints about the way in which this study has been carried out please contact the Chair of the University of Exeter Medical School Research Ethics Committee:-

Ruth Garside, PhD
Chair, UEMS Research Ethics Committee
Email : uemsethics@exeter.ac.uk

This project has been reviewed and approved by the

University of Exeter Medical School Research Ethics Committee

Appendix 3: Participant consent form

AN INVESTIGATION INTO FACTORS INFLUENCING ATTRITION BY STUDENT RADIOGRAPHERS WITH A VIEW TO THE IDENTIFICATION OF POSSIBLE PREDICTORS OF ATTRITION

UEMS REC REFERENCE NUMBER May15/E(ii)/065

PARTICIPANT CONSENT FORM

Institution Code……..

I have read the Information Sheet Version Number 3, dated 30/03/2017 concerning this project and understand what it is about. All my questions have been answered to my satisfaction. I understand that I am free to request further information at any stage.

I know that:

My participation in the study is entirely voluntary.
Y/N

I am free to withdraw from the project at any time without any disadvantage.
Y/N

The data will be retained in secure storage.
Y/N

The results of the project may be published but my anonymity will be preserved.
Y/N

I consent to provide the data requested for this study. ☐

I give permission for the data to be retained for further research. ☐

I would like the findings for this institution returned to me. ☐

Please provide an email address for the return of results.

……

I can confirm that I have the permission of my Institution's Data Protection/Governance Officer to provide this information

☐

.....	…….	.....
(Printed name of participant)	(Signature of participant)	(Date)
.....	…….	.....
(Printed name of researcher)	(Signature of researcher)	(Date)

This project has been reviewed and approved by the University of Exeter Medical School Research Ethics Committee

Appendix 4: Phase two certificate of ethical approval

UNIVERSITY OF EXETER | MEDICAL SCHOOL

University of Exeter Medical School
Research Ethics Committee

Certificate of Ethical Approval

Research Institute/Centre: Institute of Health Research

Title of Project: An online survey of student radiographers to investigate factors that could influence attrition rates

Name(s) of Project Research Team member(s): Susan McAnulla, Karen Knapp and Susan Ball

Project Contact Point: Susan McAnulla

This project has been approved for the period

From: 20 March 2018

To: 31 May 2019

University of Exeter Medical School
Research Ethics Committee approval reference: Mar18/D/157

Signature: RGarside

Date: 20 March 2018

Name of Chair
Ruth Garside, PhD

Your attention is drawn of the attached paper "Guidance for Researchers when Ethics Committee approval is given", which reminds the researcher of information that needs to be observed when Ethics Committee approval is given.

Application Reference Number 18/02/157

Appendix 5: Qualitative survey

Factors influencing non-completion of radiography education

Page 1: Information and consent

Thank you for considering taking part in this survey. Please read this information carefully before deciding whether to participate.

The survey consists of 7 questions and should only take a few minutes to complete. Please do not complete it more than once.

The information you provide will be combined with information from all other participants and analysed as part of a Masters by Research in Medical Imaging which is investigating factors that could increase the risk of student radiographers failing to complete their training and the support that may help students to remain on their courses.

It will not be possible to trace any information back to you after you have submitted your responses.

Participation should cause no distress, however, the researcher will be unaware of any experiences that you may have had. Should you experience any distress please seek support from your university or healthcare provider e.g. GP.

All data will be stored securely on an encrypted University of Exeter computer for five years following completion of the project, after which it will be deleted.

Completion of this survey is voluntary and submission of your response will be treated as consent for the information you provide to be used. You may withdraw at any point up until submission by simply closing the survey. Any incomplete responses will be discarded and therefore will not contribute to the final data set. Choosing the 'I have changed my mind' option at the end of the survey will result in the same. However, due to the survey not collecting any personal identifiers, it will not be possible to remove a response once it has been submitted as it will not be traceable to you.

Results of this project will be published in a thesis and hopefully in peer-reviewed journals and may be presented at conferences, however all results will be drawn from the pooled data of all participants and therefore no individuals will be identifiable.

Should you have any questions either before or during the survey, please contact the researcher, Sue McAnulla, at S.J.McAnulla@exeter.ac.uk or 01392 725360 or Professor Karen Knapp, Head of Medical Imaging, University of Exeter at K.M.Knapp@exeter.ac.uk or 01392 724133

If you have any complaints about the way in which this study has been carried out please contact the Chair of the University of Exeter Medical School Research Ethics Committee:-

Ruth Garside, PhD

Chair of the UEMS Research Ethics Committee

Email: uemsethics@exeter.ac.uk

This project has been reviewed and approved by the University of Exeter Medical School Research Ethics Committee

UEMS REC REFERENCE NUMBER: 18/02/157

Having read the information provided, do you consent to participate? If you do not wish to participate, please close the survey window. ✱ *Required*

- ○ Yes, I consent to participate

Page 2: About you

Are you currently a full-time student diagnostic radiographer? If not, thank you for taking the time to participate but please do not answer any further questions and close the survey window. ✱ *Required*

- ○ Yes

Which year of study are you currently in? ✱ *Required*

- ○ 1
- ○ 2
- ○ 3
- ○ 4

How old were you (in years) when you started your radiography degree? ✱ *Required*

Please enter a whole number (integer).
Your answer should be no more than 2 characters long.

What was your entry qualification for your radiography degree? ✱ *Required*

- ○ A levels
- ○ Access to Higher Education
- ○ BTEC
- ○ NVQ
- ○ Other

If you selected Other, please specify:

Page 3: Transition into your radiography degree

Thinking back to when you first started your radiography degree, what do you consider to have been the greatest challenges you faced in the transition from what you did before to becoming a student radiographer? ✱ *Required*

What strategies and/or support helped you to overcome these? *Optional*

Page 4: Progression through your radiography degree

What do you consider to have been the greatest challenges during your progression through your radiography degree to date? ✱ *Required*

What strategies and/or support helped you to overcome these? *Optional*

Page 5: Giving up

Have you ever considered giving up your radiography degree?

- ○ Yes
- ○ No

If so, what were the reasons? Choose all that apply.

Please select at least 1 answer(s).

- ☐ Personal
- ☐ Health
- ☐ Financial
- ☐ Academic difficulty
- ☐ Dissatisfaction with course
- ☐ Dissatisfaction with clinical placements
- ☐ Wrong career choice
- ☐ Other

If you selected Other, please specify:

Page 6: Consent confirmation

Please confirm that you are still willing for the information you have provided to be used. If you select 'no' your responses will be discarded. ✱ *Required*

- ○ Yes - submit my responses
- ○ No - I have changed my mind

Page 7: Thank you

Thank you very much for your time. It is greatly appreciated.

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