



Department
for Education



Graduate choices in post-education jobs and careers – a literature review

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Executive summary

Higher education has evolved into a mass education system, with nearly one in two young people participating in higher education by the age of 30. Research shows that the vast majority of graduates are still working in what are considered graduate jobs, yet the transition from higher education into work has become more complex and prolonged.

Aims and methods of the review

A key aim of the literature review is to identify 'what drives graduate choices in their post-education jobs and careers, and how this links back to their decisions when in higher education. The review focuses on a number of set research questions (RQ):

- RQ1: What types of courses qualify graduates to practise in their chosen industry or profession?
- RQ2: To what extent do the qualifications graduates gain enable them to practise in their chosen industry or profession?
- RQ3: What proportion of professions or roles require a relevant degree? Where professions / roles do require a relevant degree, is this because of specific skills gained by graduates or simply for selection purposes?
- RQ4: To what extent do graduates gain employment in their chosen field? To what extent do graduates change their minds about their career choices during their studies?
- RQ 5: What does the effect of studying for passion/personal fulfilment/career calling have on perceptions of career success?
- RQ6: What role does making a choice based on passion/personal fulfilment/career calling have on happiness/contentment with career and career success?

This literature review will feed into the Department for Education's evidence base on post-18 education and funding.

This report has been produced following a focused review of four databases and a search for grey literature in a large number of websites, covering key stakeholders, such as higher education organisations or relevant government departments. The review focused on documents published since 2005 in the English language and included some international literature. It was supplemented by a targeted secondary analysis of the Futuretrack survey, a large national longitudinal study led by Professor Kate Purcell at the Institute for Employment Research (IER). It traced 2005-6 UCAS applicants for full-time higher education courses through to 2011-12 when most participants had graduated 1-2 years earlier.

Key findings

RQ1: What types of courses qualify graduates to practise in their chosen industry or profession?

Drawing on recent data provided by the Higher Education Statistics Agency (HESA), most graduates stated that their degree was either a formal requirement or important, with slightly more graduates reporting this six months after graduation (44.7% and 25.5% respectively) than 3.5 years after completing the degree (33.8% and 29.2% respectively).

There are however huge differences by subject area, ranging from 48% to 92% of graduates stating that a degree was either required or important. To a large extent this reflects the degree of vocationality of the course, as more vocational courses, such as veterinary medicine, medicine and dentistry or subjects allied to medicine prepare graduates for specific occupations requiring a specific degree for mandatory registration with their professional body. It is thus unsurprising that the main reason for studying a particular subject is highest in these areas.

Graduates having completed postgraduate research degrees stated much more often than their peers with a bachelor or taught postgraduate degree that their degree was important or an advantage in their current job 3.5 years after graduation (81.5% compared to 63%).

RQ2: To what extent do the qualifications graduates gain enable them to practise in their chosen industry or profession?

The extent to which the qualifications that graduates gain enable them to practise in their chosen industry or profession is likely to depend on a range of factors, such as whether the industry or profession is open to a wide field of applicants, the requirement of additional skills or qualifications to practise in the chosen industry or profession, the job to person fit and the availability of jobs in the local or regional area. In some areas professional qualifications, such as e.g. Chartered Engineer, Chartered Accountant or Chartered Legal Executives, are key to employment after graduation. These combine degree requirements with a benchmarked level of professional competences. Employers may be keen to promote uptake as this qualification is valued by clients as a kite mark.

There are numerous studies, showing that, in addition to the degree requirement, other selection criteria are important in graduate recruitment, e.g. attitudes and aptitudes for work, 'soft' or 'transferable skills' or indicators of employability and work experience. Particularly in the post-recession labour market, the role of paid or unpaid work experience was important to gain a foothold in the labour market. Concerns about graduate outcomes in STEM degrees led to two reviews, the Wakeham Review and the Shaboldt Review on computer sciences. These identified particular STEM subject areas where more research was needed to establish the reasons for performing less well in the labour market. Their own research pointed to four areas: lack of 'softer skills', business awareness and practical

subject specific skills; lack of work experience; lack of career planning and awareness of employment opportunities; and lack of quantitative skills and mathematics for STEM graduates. These findings provide evidence of a more qualitative rather than quantitative nature.

Some subject areas are geared towards specific occupations or industries whereas others can potentially lead to a much wider range of occupations or industries given the broader curriculum. A recent analysis of graduates six months after completing their degree shows that the highest degree of concentration in occupations is found in subject areas such as medicine and dentistry or nursing and midwifery and lowest in law, arts and chemistry.

RQ3: What proportion of professions or roles require a relevant degree? Where professions / roles do require a relevant degree, is this because of specific skills gained by graduates or simply for selection purposes?

The question on the professions that require a relevant degree has been approached from different angles.

Applying different classifications of graduate jobs, the *overall percentage of jobs requiring a bachelor's degree* was reported to range between 24% (using two major standard occupational classification groups) to 34% and 38% respectively (using more sophisticated models) and is found to be higher in the UK than compared to the average for 16 OECD countries. However, jobs are not static, they may change in response to changes in internal and external environments, impacting on qualification requirements over time; one example being the degree entry in nursing. There is some evidence that increased supply of graduates can drive up qualifications in some occupations over time.

Studies based on job *vacancies* paint a more nuanced picture. Using a random sample drawn from a database of vacancies one study found that the percentage of relevant degrees required varies by occupation, sector and size of employer. Looking at sectors, the percentage of vacancies requiring a degree varies from 57% in business services to 94% in the public sector/other sectors and, focusing on occupations, the percentage varies from 50% in management and business studies to above 90% in engineering/manufacturing, analytical science and IT. Another study researching early career job advertisements in marketing found that jobs requiring a degree (about 50%) were open to a range of specific disciplines, e.g. marketing, business studies or psychology, depending on the nature of the vacancy.

Mirroring findings from the job vacancies analysis, *research with employers* found that demand for specific degrees was higher in science and engineering, lower in human resources or sales, and may become more important in some areas (e.g. marketing or finances).

Looking at *graduate studies*, 1.5 to 3.5 years after graduation a picture emerges showing that specific degree requirements are highest in vocational studies (particularly

medicine) and lowest in non-vocational subject areas, such as languages. Looking at the jobs graduates held 1 to 2 years after graduation, a total of 40% of jobs required a specific degree in their views. This was found to be mostly the case among health professionals (93%), followed by science, research, engineering and technology professionals (80%), and teaching and educational professionals (64%), while just over half of jobs held by graduates in the business, media and public service professional occupations and in the science, engineering and technology associate professional occupations required a degree in a specific subject. There was also recognition in some subject areas that their own or a related field would be best suited to the job, with about 6 in 10 engineers or business and social sciences experts agreeing with this in a large-scale European study. Data also showed that those who completed a more generally oriented programme were initially at a labour market disadvantage but caught up with their peers about five years later.

There are some examples of credentialism due to the greater supply of graduates, one example being entry level IT help desk positions in the United States.

RQ4: (a) To what extent do graduates gain employment in their chosen field?

Looking at the extent to which jobs are part of their long-term career plans, the most recent Longitudinal Destination of Leavers of Higher Education (L-DLHE) survey found that this percentage increased over time (from 20% six months after graduation to 36% 2.5 years after completing the degree). Evidence from the Futuretrack study also shows that graduates are still settling into their careers 1-2 years after graduation. The highest percentage of those who got exactly the job they wanted had studied medicine and dentistry (87%) followed by subjects allied to medicine (71%), education and engineering (both 58%). A survey of creative graduates undertaken 4-6 years after graduation found that 79% reported that they either work in their chosen career or in an area that is very or fairly close to it. This figure seems relatively high compared to the others and may be due to the fact the graduates have settled into their careers prior to the 2008 recession and were surveyed later on in their career.

(b) To what extent do graduates change their minds about their career choices during their studies?

The extent of drop out from higher education, as one form of career change, was found to be relatively low in Britain, with 7.7% dropping out in the first year and about 1 in 5 returning a year later. Dropout rates were reported to be higher for mature and part-time students.

Using changes in career clarity as one proxy indicator for career changes in higher education, there are mixed findings with one study finding no overall change in students' career clarity during their studies and another finding that 30% of students had clearer

career plans before leaving university. There is however evidence that work experience and greater exposure to wider areas of work can have an impact on students' career plans.

RQ 5 and 6: What does the effect of studying for passion/personal fulfilment/career calling have on perceptions of career success? What role does making a choice based on passion/personal fulfilment/career calling have on happiness, contentment with career and career success?

This review did not identify specific evidence on the effect of studying for passion, career calling or personal fulfilment on the perceptions of career success and happiness. This is largely due to two reasons: Graduate studies look at different aspects of study motivation and while examples of (international) studies focusing on passion or career calling among older graduates exist, they do not link back to study motivation.

Looking at studying for enjoyment as a proxy for personal fulfilment, Futuretrack data tended to indicate that those studying because they needed the course to enter a particular occupation, fared better in terms of both salary and job satisfaction than those who studied for enjoyment. However, this is a snapshot 1-2 years after graduation and given the prolonged period of transition particularly in non-vocational areas, this may change over time as they settle into their longer-term careers.

1. Introduction

Higher education has evolved into a mass education system, with nearly one in two young people participating in higher education by the age of 30¹. Research shows that the vast majority of graduates are still working in what are considered graduate jobs (see e.g. Purcell et al, 2013)², yet the transition from higher education into work has become more complex and prolonged.

A key aim of the literature review is to identify ‘what drives graduate choices in their post-education jobs and careers, and how this links back to their decisions when in higher education’. It will help to inform the *evidence base on post-18 education and funding*.

Specifically, the review sought to address questions on the link between higher education qualifications and access to certain areas of work; the extent to which graduates gain employment in their chosen field and the extent to which they change career choices during higher education and the effect studying for personal fulfilment has on perceptions of career success, happiness and satisfaction with career success.

Before outlining the methodology and research questions, some contextual information about higher education and the graduate labour market is provided below.

The number of students in higher education has been expanding since the millennium, then dropped in 2012/13 and began to pick up again in 2015/16³. A similar development can be observed for graduates obtaining higher education qualifications. This growth was largely driven by an increase in first degree qualifications and postgraduate taught course qualifications. In contrast the number of graduates on other types of undergraduate qualifications has fallen since 2010/11, while the number of people gaining postgraduate research qualifications has remained broadly flat over the last ten years (see Figure 1). In 2016/17, there were over 750,000 higher education leavers, with 55% holding a first degree (equivalent to more than 410,000), 10% other undergraduate qualifications, 31% a postgraduate taught degree and just under 4% a postgraduate research degree⁴.

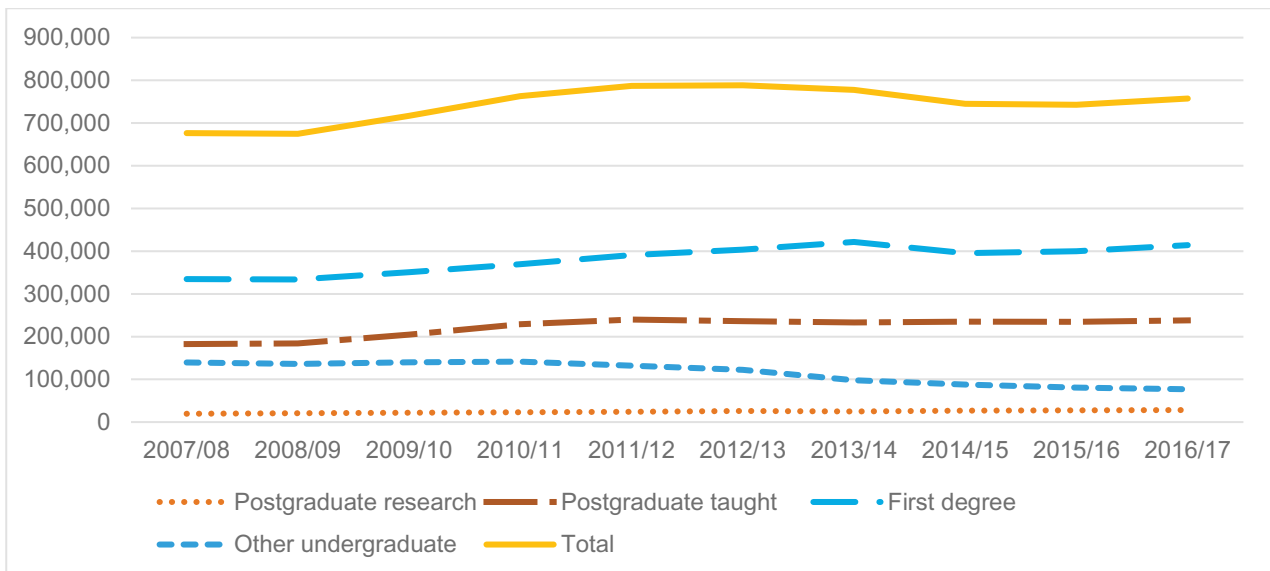
**Figure 1: Higher education qualifications obtained:
academic years 2007/08-2016/17**

¹ DfE (2017) Participation Rates In Higher Education: Academic Years 2006/2007 – 2015/2016 (Provisional)
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/648165/HEIPR_PUBLICATION_2015-16.pdf

² Purcel et al, 2013,
https://warwick.ac.uk/fac/soc/ier/futuretrack/findings/stage_4_report_final_06_03_2013.pdf

³ <https://www.hesa.ac.uk/data-and-analysis/students/whos-in-he>

⁴ <https://www.hesa.ac.uk/data-and-analysis/sfr247/figure-2>



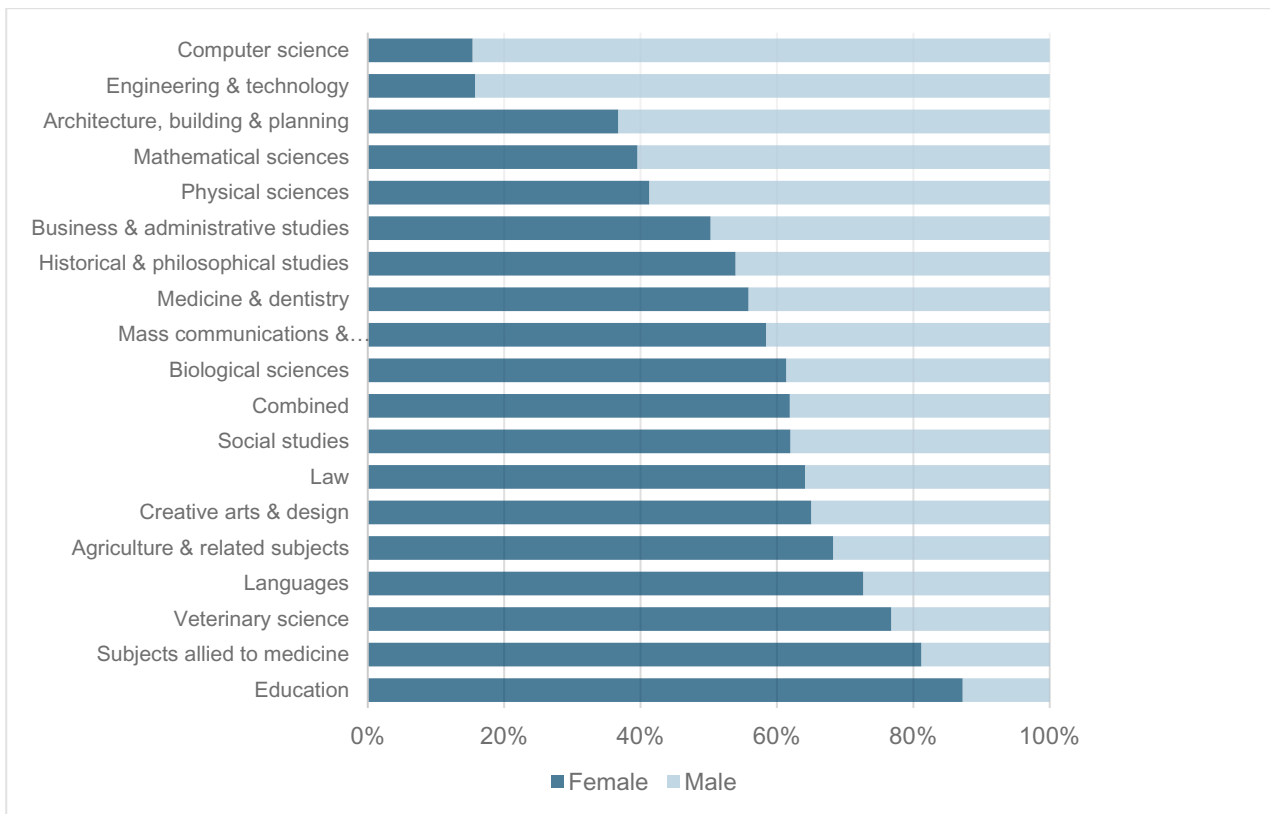
Source: <https://www.hesa.ac.uk/data-and-analysis/sfr247/figure-2> (own graph)

The last ten years have witnessed substantial changes in the funding of the higher education system and access to loans for postgraduate students, impacting on career choices. As part of the apprenticeship reforms, degree level apprenticeships have been introduced and continue to be developed in a wider range of areas, offering progression routes within the apprenticeship system and alternatives for university entrants with A-levels.⁵

Although the transition between higher education and the labour market is looser than in other European countries, the subject area of study influences initial career choices after graduation and gender plays an important role in subject choice. While, overall, relatively more women than men graduate (57% compared to 43%), there remains substantial sex differences in type of subject studied (Figure 2). Computer science and engineering and technology subjects are male-dominated (around 85%), while education and subjects allied to medicine tend to be female-dominated (81-87%). The subject group with the most even distribution of men and women are business and administrative studies, with around a 50-50 split (HESA, 2018).

Figure 2: Higher education qualifications obtained by subject area and sex, academic year 2016/17

⁵ <https://www.ucas.com/sectors-and-industries-offering-apprenticeships>



Source: <https://www.hesa.ac.uk/data-and-analysis/sfr247/figure-18> (own figure)

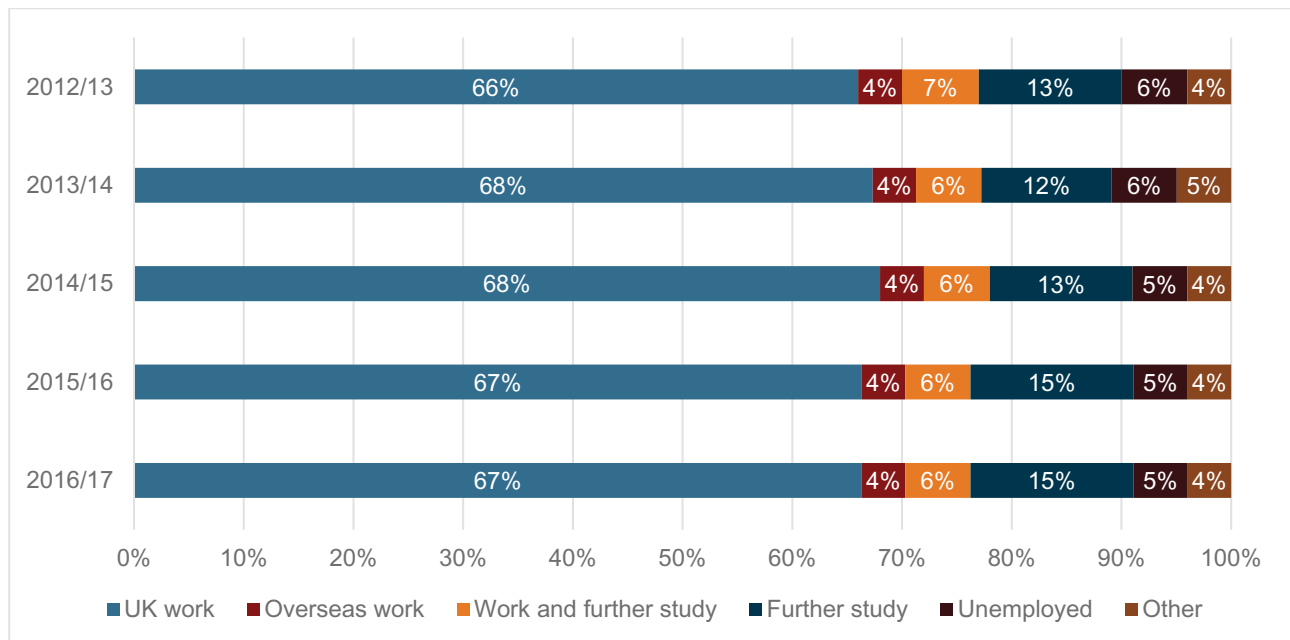
Figure 3 provides an overview of the activities of graduates six months after graduation. The diminishing impact of the recession on graduate outcomes is noticed, as the proportions of graduates in UK work and in further study are higher in 2016/17 than in 2012/13, while the proportion in unemployment is 1 percentage point lower. In 2016/17, 15% of all graduates were in further study six months after graduation and an additional 6% combined work and further study; this represents an increase compared to 5 years ago. The proportion of people signing on to undertake postgraduate study may also be influenced by the extension of tuition fee loans to master's level students.

The percentage of graduates in full-time study six months after graduation varies though by subject area, ranging from below 5% to more than a third. The percentage of those studying full time is particularly high among science-based disciplines such as molecular biology biophysics and biochemistry, microbiology and cell science, chemistry and physics (HEFCE, 2018) ⁶, as some jobs, particularly in research, require post-graduate

⁶ Higher Education Funding Council for England [Hefce] (2018) Vocational degrees and employment outcomes. Available from <http://www.hefce.ac.uk/pubs/year/2018/201801/>

qualifications. Data also show that higher attaining graduates were more likely to study for level 7 or 8 qualification (DfE, 2018b).⁷

Figure 3: Destinations of UK and other EU domiciled leavers six months after completion of study, 2012/13-2016/17



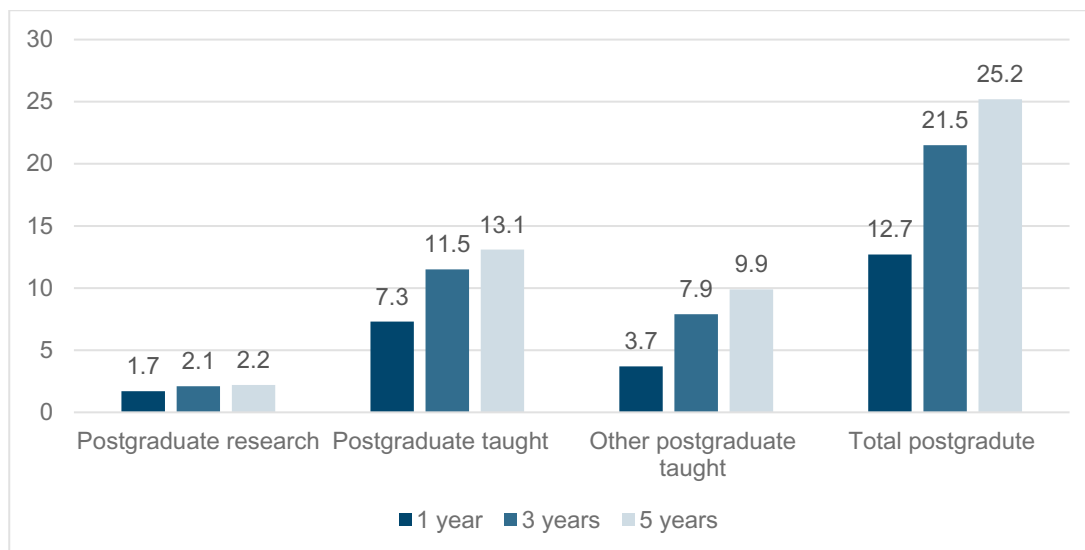
Source: HESA Destinations of Leavers from Higher Education;
<https://www.hesa.ac.uk/news/28-06-2018/sfr250-higher-education-leaver-statistics>

Looking at the first transition rates from first degree to postgraduate qualifications over a period of up to five years, the overall transition rate nearly doubled between 1 and 5 years for qualifiers in 2009-10 (12.7% and 25.2% respectively); see Figure 4. Transition to postgraduate research and postgraduate taught courses occurred most often within a year after graduation and for other postgraduate courses (including e.g. Postgraduate Certificates of Education) most frequently up to 3 years after graduation. Those who embarked on postgraduate study up to five years after graduation had most often chosen a course in the same or similar subject area they studied at undergraduate level, but there are some exceptions (e.g. modern languages, geography, sport science or mathematics). Graduates could still be pursuing qualifications in a range of other subject areas. Education was the second most often reported postgraduate subject area,

⁷ DfE (2018b) Graduate Outcomes (LEO): Postgraduate Outcomes in 2015 to 2016. Available from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/710157/Main_Text.pdf

irrespective of the subject area chosen for their first degree (HEFCE, 2016).⁸ This could indicate that many of them have embarked on teacher training courses.

Figure 4: First transition rates from first degree to postgraduate study for qualifiers in 2009-10 by postgraduate level and years after 1st degree (in %)



Source: HEFCE, 2016, p.8⁹ (own figure). Base: young full-time UK students at English higher education institutions. Number of total qualifiers: 175,380.

Experimental data looking at UK domiciled graduates' longitudinal educational outcomes (LEO) for the 2015/16 tax year indicate that the proportion of postgraduates in further study (with or without sustained employment) drops considerably 5 years and again 10 years after graduation^{10 11} as graduates mature in their professional lives.

Subject area choices also have implications for earnings across the life cycle, with medicine and dentistry graduates earning on average the highest salaries. New experimental data for UK graduates indicate earnings of both UK first degree graduates and postgraduates increase over 1, 3, 5 and 10 years (DfE, 21018a; DfE, 2018 b) and that postgraduate degrees attract a pay premium compared to a first degree in the same subject area, with the difference being particularly large in business studies and administrative studies, education and computer science and quite small in creative arts and design and languages (excluding English studies) (DfE, 2018b).

⁸ Hefce (2016) Transitions into postgraduate study: Trends for one, three and five-year transition periods for 2002-03 to 2013-14 qualifiers. Available from: <http://www.hefce.ac.uk/pubs/year/2016/201614/>

⁹ Op. Cit.

¹⁰ DfE (2018b) Graduate Outcomes (LEO): Postgraduate Outcomes in 2015 to 2016. Available from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/710157/Main_Text.pdf

¹¹ Similar data have not been found for first degree graduates.

2. Aims of the review and methodology

The Institute for Employment Research (IER) was commissioned by the Department for Education (DfE) to undertake a rapid evidence review to identify ‘what drives graduate choices in their post-education jobs and careers, and how this links back to their decisions when in Higher Education ‘to help inform the Department for Education’s evidence base on post-18 education and funding.

Specifically, the review seeks to address the following questions.

1. What types of courses qualify graduates to practise in their chosen industry or profession?
2. To what extent do the qualifications graduates gain enable them to practise in their chosen industry or profession?
3. What proportion of professions or roles require a relevant degree? Where professions / roles do require a relevant degree, is this because of specific skills gained by graduates or simply for selection purposes?
4. To what extent do graduates gain employment in their chosen field? To what extent do graduates change their minds about their career choices during their studies?
5. What does the effect of studying for passion/personal fulfilment/career calling have on perceptions of career success?
6. What role does making a choice based on passion/personal fulfilment/career calling have on happiness/contentment with career and career success?

IER has undertaken bibliographic and ‘grey’ literature searches to identify studies relevant to the main research questions, focusing on studies published since 2005 in English that explored the career choices of graduates up to five years after they completed their degrees:

- **Focused review:** the focused bibliographic literature review has covered five databases. These are: the British Education Index (focused on the UK), Emerald, Applied Social Sciences Index, International Bibliography of Social Sciences and Web of Science. These databases are the ones identified as the most relevant to the study based on the experience of the researchers and consultation with University of Warwick library staff. The database search identified 300 sources relevant to the study (excluding duplicates).
- **‘Grey’ literature review:** this review covered websites relevant to the main research questions, including: UK Government (DfE/BIS/BEIS); Higher Education Careers Services Unit (HECSU); Higher Education Statistics Agency (HESA);

Higher Education Funding Council for England (HEFCE); Office for Students (OfS); Universities UK and The Edge Foundation. In addition, a Google search was undertaken using the search terms of the focused review.

In addition, the IER has undertaken a descriptive **secondary analysis of the Futuretrack survey**, led by Professor Kate Purcell in close collaboration with Professor Peter Elias, focusing on specific questions.

The literature search was undertaken across the following databases: British Education Index, Emerald, ASSIA, IBSS and Web of Science. The search process was an iterative exploratory process, the main components of which are described below.

The primary search terms were graduate* OR higher education, with secondary search terms being specific to each question:

- Q1-3 (qualif* or degree) AND (labour market OR industry OR profession OR job OR occupation OR employment)
- Q4: (drop out OR dropout OR career goals OR career choice or career decision making OR career plan)
- Q5-6: (passion OR personal fulfilment OR career calling OR career values OR personal values)

The search focused on journal articles in English language published after 01/01/2005, in line with the decision taken in the other projects.

As a result of these searches, 331 titles (and often abstracts) were reviewed.

Once all duplicates were removed, the total number of abstracts saved for review from all searches (across databases) was 300.

2.1 Database review

Table 1 shows the number of abstracts that were reviewed against the inclusion criteria and the initial groups they were assigned to.

The references have been grouped according to the research questions, cited once in full and if relevant for another question, cited using author and year only.

Table 1: Abstracts reviewed and saved

Research question number	Number of abstracts reviewed	Number IDed for full article review
RQ1-RQ3	300	19
RQ4		23
RQ5-6		13
Total	300	55

While the review has covered documents published since 2005, the presentation in this report has focused more on the recent graduate studies and on first degree students given the reporting deadline. Publications on subject areas attracting relatively few students have generally not been included in the literature review to focus on the bigger picture.

2.2 Grey literature search

The grey literature search was carried out synchronously for the three reviews undertaken by the wider IER research team, due to the significant overlap in the topic areas, the websites to be reviewed and search terms to be used.

A total of 69 websites were reviewed although in some cases, sites were covered by a single search function (e.g. <https://www.gov.uk/government/publications> covers literature for several government departments on our list).

Initially, the research and/or publications page (or similar) was reviewed to identify any literature relevant to the study. In addition, a site search was undertaken using the following search terms both separately and in combination where needed in order to make the number of results manageable: 'choice', 'decision', 'benefits', 'careers', 'value', 'returns', 'outcomes', 'education', 'graduates', 'degree'.

Approach and results

The 69 websites reviewed were selected as they were sites previously identified as sources of literature on education, employment, careers and young people's and adult's learning and skills. An initial examination of the research and/or publications page, or the equivalent, for each site was carried out in order to get an idea of the number of publications contained. In cases where there was only a small number of publications on the site (e.g. fewer than 150) the full list of titles was reviewed for relevance to any of the three above studies. Where the website contained many more publications the search

function was used, employing the terms outlined above, in order to reduce the number of titles to a manageable amount. A list of the websites reviewed can be seen in the table below.

After examining the title and abstract/summary (where available) a total of 36 documents (excluding duplicates) were identified of relevance to this review.

Websites with relevant literature

Organisation	Web address
AELP	https://www.aelp.org.uk/resource-and-information-centre/
Association of Colleges	https://www.aoc.co.uk/
Behavioural Insights	http://www.behaviouralinsights.co.uk/
British Social Attitudes	http://www.bsa.natcen.ac.uk
NatCen	http://www.natcen.ac.uk
Campbell Collaboration	https://www.campbellcollaboration.org/
Careers and Enterprise Company	https://www.careersandenterprise.co.uk/
CBI	http://www.cbi.org.uk/
CEDEFOP	http://www.cedefop.europa.eu/en/
Centre for Economic Performance	http://cep.lse.ac.uk/
Centre for Longitudinal Studies	http://www.cls.ioe.ac.uk/default.aspx
Centre for Regional Economic and Social Research	http://www.shu.ac.uk/research/cresr/reports
Centre for Research on Learning and Life Chances	http://www.llakes.ac.uk/
Centre for the Economics of Education	http://cee.lse.ac.uk/
Children and Young People Now	https://www.cypnow.co.uk/
Cochrane Collaboration	http://www.cochrane.org/
CVER	http://cver.lse.ac.uk/publications/default.asp
DfE, DWP, BIS etc.	https://www.gov.uk/government/publications
DG Employment, Social Affairs & Inclusion	http://ec.europa.eu/social/main.jsp?langId=en&catId=22
Edge Foundation	http://www.edge.co.uk/
Education and Employers	https://www.educationandemployers.org/research-main/

Organisation	Web address
Education and Training Foundation	http://www.et-foundation.co.uk/
Education Endowment Foundation	https://educationendowmentfoundation.org.uk/
EPPi Centre	http://eppi.ioe.ac.uk/cms/Default.aspx?tabid=53
ESRC	https://esrc.ukri.org/
European Expert Network on Economics of Education	http://www.eenee.de/eeneeHome/EENEE.html
Futuretrack	https://warwick.ac.uk/fac/soc/ier/futuretrack/
Gatsby	http://www.gatsby.org.uk/
HECSU	https://www.hecsu.ac.uk/
HEFCE (now closed)	http://www.hefce.ac.uk/
HEPI	http://www.hepi.ac.uk/category/publications/
HESA	https://www.hesa.ac.uk/
High Flyers	http://www.highfliers.co.uk/
ILO	http://www.ilo.org/global/publications/lang--en/index.htm
Institute for Apprenticeships	https://www.instituteforapprenticeships.org/
Institute of Education	http://eprints.ioe.ac.uk/
IPPR	https://www.ippr.org/
Joseph Rowntree Foundation	https://www.jrf.org.uk/
Learning and Work Institute	http://www.learningandwork.org.uk/
Living Map of Jobs Innovators	https://jobsinnovators.org/
National Foundation for Educational Research (Nfer)	https://www.nfer.ac.uk/
National Institute of Economic and Social Research	https://www.niesr.ac.uk/publications/search
NESTA	http://www.nesta.org.uk/
OECD - education	http://www.oecd-ilibrary.org/education;jsessionid=1m44398oar1y8.x-oecd-live-02
OECD - employment	http://www.oecd-ilibrary.org/employment;jsessionid=1m44398oar1y8.x-oecd-live-02
OECD library	http://www.oecd-ilibrary.org/
OfS	https://www.officeforstudents.org.uk/
HEFCE / OfS learning gain pilot projects	https://www.officeforstudents.org.uk/advice-and-guidance/teaching/learning-gain/

Organisation	Web address
Ofsted	https://www.gov.uk/government/organisations/ofsted
Paul Hamlyn Foundation	https://www.phf.org.uk/publications/
People, Place and Policy	http://extra.shu.ac.uk/ppp-online/
Poverty Reduction in Europe: Social Policy and Innovation (ImPRovE)	http://improve-research.eu/
Prof. Claire Callender	http://www.bbk.ac.uk/psychosocial/our-staff/academic/claire-callender
RSA	https://www.thersa.org/
SKOPE	http://www.skope.ox.ac.uk/
Social Mobility Commission	https://www.gov.uk/government/publications?departments%5B%5D=social-mobility-commission
Social Policy Research Unit	http://www.york.ac.uk/inst/spru/index.html
Sutton Trust	https://www.suttontrust.com/research/
The Centre for Vocational Education Research (CVER)	http://cver.lse.ac.uk/publications/default.asp
The Mindset	http://www.themindset.org.uk/media/publications/
UK Commission for Employment and Skills	https://www.gov.uk/government/organisations/uk-commission-for-employment-and-skills
UNESCO	http://www.unesco.org/ulis/en/advanced_search.html#6401922
University College London	http://discovery.ucl.ac.uk/
VOCEDplus	http://www.voced.edu.au/
What Works Centre for Local Economic Growth	http://www.whatworksgrowth.org/about-us/
Work Foundation	http://www.theworkfoundation.com/wf-reports/
YouthSight	https://www.youthsight.com/expertise/higher-education-research/

In addition, the following websites were also searched:

Professor Kate Purcell	https://www.youthsight.com/expertise/higher-education-research/
Quality Indicators for Teaching and Learning (QILT, Australia)	https://www.qilt.edu.au/about-this-site/graduate-employment
Reflex study	http://roa.sbe.maastrichtuniversity.nl/?portfolio=reflex-international-survey-higher-education-graduates
Universities UK	https://www.universitiesuk.ac.uk

2.3 Secondary analysis of selected Futuretrack data

The IER also conducted a descriptive analysis of selected Futuretrack data to shed light on the research questions, where published material is particularly scant.

Futuretrack is a longitudinal survey of people who applied to full-time higher education in 2005-06. It followed applicants through their experience of higher education and employment. The survey was conducted in four stages, with the fourth and latest stage of the survey carried out in 2011-12, when most of the respondents had graduated and had been in employment for about 1-2 years. The IER identified suitable questions across all four waves that could help to address some of the research questions. This included for example, graduates' reasons for choosing their undergraduate degree at the time of applying to higher education at stage 1.

The analysis here focuses on *first-degree graduates* (i.e. those who completed an undergraduate degree and were no longer a full-time student at the time of the stage 4 survey) and who were *UK-domiciled at the time of application to university* (i.e. people who were UK nationals and who lived in the UK at the time of applying to higher education). These criteria yield 9,164 cases for analysis, of whom 7,955 were in employment (full- or part-time, including self-employment) at stage 4. Weights are used to correct for an over-representation of women and respondents who scored high tariff points in the data. Population weights have been calculated for every survey wave, and this analysis uses weights for wave 4 (w4)¹². Weighted figures are used in all Futuretrack secondary data analysis reported here, unless otherwise stated.

¹² For more information on weights, see the discussion in Purcell et al. (2008, p. 171) and Purcell et al. (2013, pp. 201-03).

3. Graduate choices in post-education jobs and careers

3.1 RQ1: What types of courses qualify graduates to practise in their chosen industry or profession?

Degree courses open opportunities in a range of professions or industries related to the subject area of the degree. The career paths of more vocational subject areas will be more specific and pre-determined, often leading to a particular occupation (e.g. medical doctor, nurse or engineer), than those in non-vocational areas where a range of career paths will need to be explored. Large-scale graduate studies tracing individuals after their graduation may ask whether a degree or a relevant degree was required for getting the job in a particular profession or industry. Subsequent analysis does, however, not hone in specifically on whether this job is in their chosen industry or profession, the focus of both RQ1 and RQ2.

One way of approximating, although not directly addressing, this question is to focus on the percentage of graduates who are currently in a job that, in their view, requires a degree by subject area studied. Such data are collected routinely through the Destination of Leavers of Higher Education (DLHE) survey 6 months after graduation and the Longitudinal Destination of Leavers of Higher Education (L-DLHE), following up a sample of earlier DLHE respondents up to 3.5 years after graduation.

A recent secondary analysis of DLHE and L-DLHE data found that six months after graduation overall 44.7 % of those completing an undergraduate degree or a taught postgraduate degree stated that the qualification obtained was a formal requirement and a further 23.5% that, while not a requirement, it gave them an advantage. Three and-a-half years after graduation the percentage who reported that the qualification obtained was a requirement has fallen (33.8%), while the percentage reporting no formal requirement but an advantage increased to 29.2%. Science, Technology, Engineering and Mathematics (STEM) graduates reported much more often that the qualification obtained was a formal requirement for the job compared to Arts, Humanities and Social Sciences (AHSS) graduates (54.3% and 28.2% respectively overall, and ranging from 20.8% in Creative Arts and Design to 35.4% in Social Sciences). Three and a half years after graduation the difference decreased, with 38.6% of STEM graduates reporting that the qualification obtained was a formal requirement compared to 23.4% in AHSS and about three in ten in each group reporting that the qualification obtained, although not required, was an advantage. In contrast, a higher percentage of those having completed a postgraduate research degree self-assessed that the type of degree was important or

an advantage and this changed very little at six months after graduation (55.3% and 25.7% respectively) and 3.5 years after graduation (53.8% and 27.7% respectively).¹³

Published data for L-DLHE 2010-11, providing data for 19 subject groups, show that the percentage of graduates who stated that a formal qualification was required, or important for the job, is highest in veterinary sciences (92%), medicine and dentistry (89%), subjects allied to medicine (83%) and lowest in for example creative arts and design (44%), mass communications and documentation (46%) and historical and philosophical studies (48%) (See Table 2).¹⁴

Reasons for choosing the main course of study vary between individuals. At the time of applying to higher education, most people reported that the main reason for choosing to do their degree subject was that they enjoyed studying the subject or topic of the course, but the second main reason related to needing the course to enter a particular profession (Purcell et al., 2008¹⁵). Data from the secondary analysis of Futuretrack data show that the proportions of respondents who reported that they needed the course to enter a particular occupation were highest among:

- those who registered to study specialist vocationally-orientated subjects such as medicine and dentistry (79%), subjects allied to medicine (64%) and education (60%) and lowest in discipline-based academic subjects (7%) which covered physical sciences, linguistics and classics and historical and philosophical studies (see Figure 5);
- those working in the public sector after their graduation (45%, compared to 14% in the private sector and 20% in the non-profit sector), presumably in large part due to many of those studying medicine/dentistry, subjects allied to medicine and education working in the public sector;
- those working in professional occupations (42%) compared to all other Standard of Occupational Classification (SOC) 2010 major groups; and those working as health professionals (73%), followed by teaching and educational professionals

¹³ Lyonette et al. (2017) *Occupations and skills of Arts, Humanities and Social Sciences Graduates*. British Academy. <https://www.britac.ac.uk/sites/default/files/AHSS-graduate-employment-outcomes.pdf>

¹⁴ Universities UK (2016) *Higher education in England: Provision, skills and graduates*. Available from: <http://www.universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2016/higher-education-in-england-provision-skills-and-graduates.pdf>

¹⁵ Purcell, K., Elias, P., Ellison, R., Atfield, G., Adam, D. and Livanos, I. (2008) *Applying for Higher Education? the diversity of career choices, plans and expectations*. Findings from the First Futuretrack Survey of the Class of 2006 applicants for Higher Education. Manchester: HECSU/UCAS/IER, Available from: https://warwick.ac.uk/fac/soc/ier/futuretrack/findings/futuretrack_2006_stage1_full_report_2008.pdf

(48%) and health and care associate professionals (32%) compared to other SOC 2010 sub-major groups.¹⁶

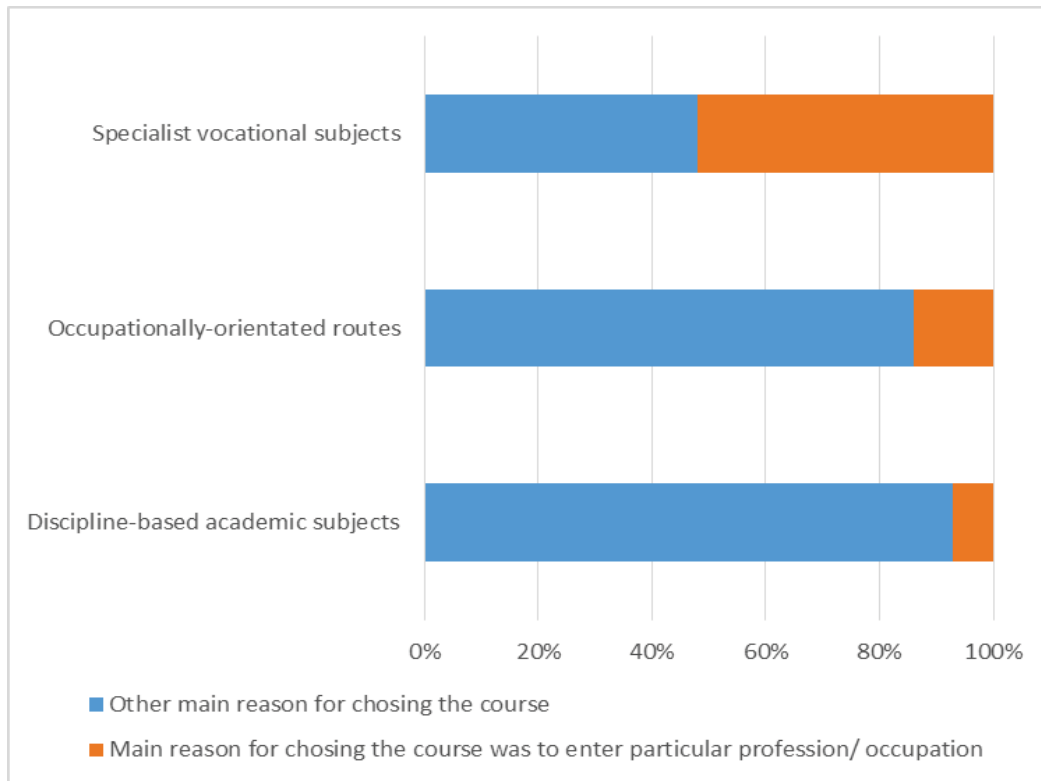
Table 2: Importance of attributes in attaining current job, UK-domiciled graduates from universities only, all qualifications (40 months after graduation)

All levels	Type of qualification: Formal / important	Subject studied: Formal / important	Degree class: studied: Formal / important	Skills and competencies : formal / important	Formal/important: Relevant work experience from previous employment
Historical & philosophical studies	48%	29.60%	39.10%	78.70%	67.50%
Mathematical sciences	67%	61.00%	55.70%	84.70%	48.20%
Combined	48%	39.20%	31.40%	70.00%	71.80%
Languages	54%	37.30%	40.40%	82.00%	70.80%
Physical sciences	63%	54.70%	45.40%	80.40%	56.70%
Creative arts & design	44%	45.60%	26.30%	75.60%	64.00%
Law	62%	57.40%	53.10%	83.00%	67.40%
Computer science	57%	61.80%	42.60%	79.60%	58.10%
Mass communications & documentation	46%	44.10%	29.80%	79.70%	70.50%
Business & administrative studies	54%	50.00%	39.80%	79.50%	69.60%
Biological sciences	57%	51.20%	42.00%	79.40%	68.00%
Engineering & technology	69%	70.70%	51.20%	82.80%	57.90%
Social studies	59%	49.00%	42.40%	83.00%	71.90%
Agriculture & related subjects	49%	55.20%	31.10%	76.20%	68.60%
Architecture, building & planning	73%	73.50%	46.70%	83.00%	70.00%
Subjects allied to medicine	83%	85.10%	50.20%	88.50%	64.60%
Medicine & dentistry	89%	90.10%	42.50%	91.00%	66.50%
Education	81%	81.00%	53.60%	88.80%	68.50%
Veterinary science	92%	95.40%	24.60%	93.40%	72.60%
Total all levels	63%	58.90%	43.30%	82.40%	66.70%

Source: HESA Longitudinal Destinations of Leavers from Higher Education 2010-11, cited in Universities UK (2016, p.29)

¹⁶ Note that the sub-major occupational groups where the number of observations was below 20 in a cell were excluded from the analysis.

Figure 5: Main reason for choosing degree subject by vocationality of the subject area
 (contrasting those who reported that they needed the degree to enter a particular occupation and those deciding to do their course for other reasons)



Legend:

Specialist vocational subjects: Architecture, Build & Plan, Medicine & Dentistry, Education, Law, Engineering, Technologies, Subjects allied to Medicine;

Occupationally-orientated routes: Mass communication and Documentation, Interdisciplinary, other combined subjects, Mathematical & Comp Science, Social Studies, Business & Admin studies, Creative Arts & Design, Biology, Vet Science, Agricultural & related;

Discipline-based academic subjects: Physical Sciences, Linguistics and Classics, Languages, History & Philosophical studies” (see Purcell et al., 2009, p.98).

Source: Futuretrack Waves 1-4, first-degree UK-domiciled graduates only.

The Reflex study, a pan-European research project tracing graduates having achieved their first degree during the academic year 1999/2000 five years after graduation, found that 88% of graduates thought the same or a higher level of education was most appropriate for their job. Only the non-professional group, constituting 13% of all

graduate jobs, reported that their jobs required either a lower level of tertiary education or a level below that (Allen and van der Velden, 2007)¹⁷.

In some areas there will be a stronger correspondence between degree course and employment, due to regulatory requirements and the length of training. A UK study estimating the percentage of medical doctors working in medicine 2 to 25 years after graduation found that two and five years after graduation 90% or more were working in medicine. Similar results applied up to 25 years after graduation but there was a greater range of minimum to maximum estimation as more time since graduation lapsed (Goldacre and Lambert, 2013)¹⁸.

In other areas graduates may look for ways to apply their skills and knowledge in a range of fields with varying levels of success. For example, Cumunian et al. (2011)¹⁹ concluded that creative skills of graduates in creative design 'are not fully valued or appreciated in the job market' (p.305), drawing on DLHE data six months after graduation.

3.2 RQ2: To what extent do the qualifications graduates gain enable them to practise in their chosen industry or profession?

There are some indicators that can help to address this question:

- Any expressed concerns about lack of skills, experience or other personal attributes, which means graduates may lose out on getting the job, despite having achieved the degree (this will need to rely on evidence of a more qualitative nature):
- The extent to which graduates are in graduate jobs (this will be discussed under RQ4) or in jobs that require, in their view, a degree (this has already been discussed under RQ1).

However, as noted before, the literature focuses on the type of industry or occupation in general, and not specifically on whether it was in the chosen area.

There are numerous studies, showing that, in addition to the degree requirement (either any or a relevant degree), other selection criteria are important in graduate recruitment,

¹⁷ Allen and van der Velden, R (2007) *The Flexible Professional in the Knowledge Society: General Results of the REFLEX Project*. http://roa.sbe.maastrichtuniversity.nl/roanew/wp-content/uploads/2014/02/reflex_book_eu.pdf

¹⁸ Goldacre and Lambert (2013). "Participation in Medicine by Graduates of Medical Schools in the United Kingdom up to 25 Years Post Graduation: National Cohort Surveys." *Academic Medicine* 88(5): 699-709.

¹⁹ Comunian et al. (2011) Winning and losing in the creative industries: an analysis of creative graduates' career opportunities across creative disciplines, *Cultural Trends*, 20:3-4, 291-308

e.g. attitudes and aptitudes for work (CBI/Pearson, 2017²⁰; Handley 2018²¹), 'soft' or 'transferable skills' or indicators of employability (c.f. The Edge Foundation, 2017²²; Universities UK, 2016²³; Branine and Avramenko, 2015²⁴; Branine, 2008²⁵; Thomlinson, 2008²⁶), and they may not all be learned at university (c.f. Tholen et al., 2016); class of degree (c.f. De Pietro, 2017²⁷; CBI/Pearson, 2017²⁸; Pollard et al, 2015²⁹); and work experience (c.f. Pollard et al., 2015³⁰; BIS, 2013³¹). Particularly in the post-recession labour market, the role of paid or unpaid work experience was important to gain a foothold in the labour market (see e.g. Purcell et al., 2017)³².

Concerns about graduate outcomes of STEM graduates, and in particular computer science graduates, led to the commission of two reviews to investigate the issue in more detail. The Wakeham Review³³ found that graduates from some STEM subject areas suffered worse graduate outcomes (measured by the percentage in employment; the percentage in managerial, professional and associate professional jobs; and the percentage in low pay) than others: Biological Sciences; Earth, Marine and Environmental Sciences; and Agriculture, Animal Sciences and Food Sciences. Areas of less concern but equally recommended as meriting further research were Biomedical Engineering, Aerospace Engineering and Engineering Design.

²⁰ CBI/Pearson (2017) *Helping the UK thrive, the 2017 CBI/Pearson Education and Skills survey*. <http://www.cbi.org.uk/news/skills-needs-must-now-drive-reforms-cbi-pearson-education-and-skills-survey/>.

²¹ Handley, K. (2018). "Anticipatory Socialization and the Construction of the Employable Graduate: A Critical Analysis of Employers' Graduate Careers Websites." *Work, Employment and Society* 32(2): 239-256.

²² The Edge Foundation (2017) *Our plan for Higher Education. Diverse, employment-focused, value for money*. <http://www.edge.co.uk/OurPlanforHE>.

²³ Op. cit.

²⁴ Branine and Avramenko (2015) "A Comparative Analysis of Graduate Employment Prospects in European Labour Markets: A Study of Graduate Recruitment in Four Countries. *Higher Education Quarterly*". 69 (4), pp 342-365.

²⁵ Branine, M. (2008). "Graduate recruitment and selection in the UK: A study of the recent changes in methods and expectations." *Career Development International* 13(6): 497-513.

²⁶ Tomlinson, M. (2008). "The degree is not enough: students' perceptions of the role of higher education credentials for graduate work and employability." *British Journal of Sociology of Education* 29(1): 49-61.

²⁷ Di Pietro, G. (2017). "Degree classification and recent graduates' ability: Is there any signalling effect?" *Journal of Education and Work* 30(5): 501-514.

²⁸ Op. cit

²⁹ Op. cit.

³⁰ Op. cit

³¹ BIS (Department for Business, Innovation & Skills) (2013). *Learning from Futuretrack: The Impact of Work Experiences on Higher Education Student Outcomes* (Authors: Andrew McCulloch and colleagues). (Authors: Andrew McCulloch and colleagues). Available from https://www.hecsu.ac.uk/assets/assets/documents/Futuretrack_BIS_Learning_from_futuretrack_work_experience.pdf

³² Purcell, K. et al (2017) *Present tense, future imperfect? Young people's pathways into work*. https://warwick.ac.uk/fac/soc/ier/research/pathways/presenttensefutureimperfect_final.pdf

³³ *Wakeham Review of STEM degree provision and graduate employability* (2016) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/518582/nd-16-6-wakeham-review-stem-graduate-employability.pdf

The reasons for these concerns were explored in a stakeholder survey that attracted 470 responses from representatives from universities, employers and professional, statutory or regulatory bodies. The four common themes identified were: lack of 'softer skills' (for example, attitudes, team-working, adaptability, and commitment to lifelong learning given the fast pace of change in the industry), business awareness and practical subject specific skills; lack of work experience; lack of career planning and awareness of employment opportunities; and lack of quantitative skills and mathematics³⁴. This was largely confirmed in the focus groups run for the three subject areas that have presented most concern, although the key issues varied slightly.

The data gathered during the review included anecdotal evidence that lack of required skills may mean that computer science graduates may lose out to other STEM graduates³⁵. This suggests that despite having studied a subject area that is arguably in demand to support the government's science and innovation strategy, some graduates may find it difficult, at least initially, to find a job in the area they may have chosen due to the lack of sought-after skills.

A different way of approaching this question, briefly considered but not pursued, would be to explore the degree of correspondence between the subject area of their degree and their area of work. This is more appropriate and feasible for vocational courses leading to a particular profession (e.g. medicine) or occupations with corresponding economic subsectors (e.g. graduates with a degree in engineering working in engineering). In non-vocational subject areas, such as e.g. humanities or physics, graduates may look for a wide range of job opportunities to bring to bear their subject specific knowledge across a wide spectrum of occupations and /or industries. Survey data have shown, 'a strong correlation between the subject studied and the occupation' of graduates, particularly for medicine and dentistry and architecture and engineering but less so for arts and creative arts (Shury et al., 2017, p. 41³⁶). Similarly, the Higher Education Funding Council for England (HEFCE, 2018)³⁷, found that the concentration in the three most prevalent occupations in any particular subject area six months after graduation is highest in medicine and dentistry, nursing and midwifery and teacher training and low in e.g. management studies, sociology, arts or chemistry. It also needs to be borne in mind that not everybody necessarily wishes to work in an area that corresponds to their subject

³⁴ Similar issues were identified in a stakeholder survey with regards to computer science graduates. However the lack of knowledge was more related to computer sciences (programming or specific knowledge) and lack of career planning was not identified as a major issue (Shaboldt Review, 2016).

³⁵ *Shadbolt Review of Computer Sciences Degree Accreditation and Graduate Employability* (2016). <https://www.gov.uk/government/publications/computer-science-degree-accreditation-and-graduate-employability-shadbolt-review>

³⁶ Op. cit.

³⁷ Higher Education Funding Council for England [Hefce] (2018) Vocational degrees and employment outcomes. Available from <http://www.hefce.ac.uk/pubs/year/2018/201801/>

degree, although most will (see e.g. Purcell et al. 2008³⁸ with regards to chemistry graduates. Similar findings have also been reported for creative graduates).

3.3. RQ 3: Proportion of professions or roles that require a relevant degree

There is some literature on this topic, addressing the question from different angles.

(a) What proportion of professions or roles require a relevant degree?

This section will explore facets of the question, first by looking at the share of graduate jobs, defined by the skills requirement for occupations (including degree). This will be followed by findings from job advertisement analyses on (relevant) degree requirements and qualitative assessments on the relevance of any or a relevant degree by employers and graduates.

Degree requirement of jobs (based on different systems of job classifications)

There is currently no generally accepted definition of a graduate job, thus figures on the percentage of jobs requiring a bachelor's degree among UK jobs varies by type of classification. Using the two-digit Standard Occupational Classification (SOC), the Universities UK (2015)³⁹ calculated that the figure for jobs requiring a bachelor's degree is 24% for 2012. This classification defines graduate jobs as synonymous with managerial and professional jobs (major categories 1 and 2), but excludes, for example, occupations classified as associate professional jobs (categories 3), many of which also require a degree. More sophisticated frameworks involving skill-based classifications at the most detailed (four-digit) SOC level have been developed by Elias and Purcell in 2004⁴⁰, revised in 2013⁴¹, and by Green and Henseke (2014)⁴². If these classifications are applied, Universities UK (2015) calculates that 34% and 38% respectively of UK jobs require a bachelor's degree. The international classification of graduate jobs by Henseke and Green (2017)⁴³, based on the International Standard Classification of Occupations

³⁸ Op. cit.

³⁹ Universities UK (2015) Supply and demand for higher level skills. <https://www.universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2015/supply-and-demand-for-higher-level-skills.pdf>.

⁴⁰ Elias, P. and Purcell, K. (2004). *SOC(HE): a classification of occupations for studying the graduate labour market*. Research Paper 6, University of Warwick, Institute for Employment Research.

⁴¹ Elias, P. and Purcell, K. (2013) *Classifying graduate occupations for the knowledge society (revised classification based on various forms of HE knowledge for each 4 digit occupation)* (SOC(HE) 2010_EP).

⁴² Green, F. & Henseke, G (2014) *The Changing Graduate Labour Market: Analysis Using a New Indication of Graduate Jobs*. http://www.llakes.ac.uk/sites/default/files/50.%20Green%20and%20Henseke_0.pdf

⁴³ Henseke, G. and Green, F. (2017) "Graduate Jobs" in OECD Countries: Development and Analysis of a Modern Skills-Based Indicator. Research Paper 5.3. <http://www.llakes.ac.uk/research-papers>.

2008 and skills indicators, found that in the UK 35% are graduate jobs, compared to an average of 29% in 16 OECD countries.

For some occupations a relevant degree will be mandatory (e.g. doctors as they need to have certain skills and qualifications to be able to register with their licencing body), while for others (e.g. human resource managers) the degree requirement may vary from job to job and/or the selection criteria set by the employer. Moreover, 'jobs are not static entities' (Elias and Birch, 2010, p.2⁴⁴) as they will reflect changes in the organisation of work, e.g. due to technological changes such as the digitisation of work and automation of work, which may in turn impact on qualification requirements over time, and or changes in (nationally agreed) qualification requirements, such as the degree requirement for nursing, introduced in 2013. An increased supply of degree holders in the wake of the expansion of higher education may also drive up qualification requirements set by employers in some occupations over time (see for example Burning Glass, 2014⁴⁵ or Aldridge and Evetts, 2003⁴⁶, cited in Chillias, 2010)⁴⁷.

Relevance of degree requirements – findings from job advertisements ⁴⁸

Another important source of job or degree requirements are job advertisements. Due to technological changes, more and more jobs are advertised online, and this wealth of information can be harnessed to provide information about job-specific qualification and skills requirements. While the analysis of online job postings offers a range of benefits (e.g. using employers' specification of skills requirements) there are also drawbacks, e.g. representativeness of data (as not all jobs are advertised online, and coverage may vary according to skill level or sector) or errors that may occur in collecting and coding data (c.f. Nesta 2018⁴⁹; Carnevale, 2014⁵⁰; and Harper 2012⁵¹). For the US labour market Carnevale et al. (2014) estimated that around 60-70% of job openings are posted online, rising to an estimated 80 to 90% for those with at least a bachelor's degree as they are

⁴⁴ Elias, P. and Birch, M. (2010) SOC 2010: *The revision of the Standard Occupational Classification 2000*. https://warwick.ac.uk/fac/soc/ier/publications/2010/elias_birch_soc2010_revision_2010.pdf.

⁴⁵ BurningGlass (2014). *Moving the goalposts. How demand for a Bachelor's degree is reshaping the workforce*. https://www.burning-glass.com/wp-content/uploads/Moving_the_Goalposts.pdf.

⁴⁶ Aldridge, M. and Evetts, J. (2003), "Rethinking the concept of professionalism: the case of journalism", paper presented at the Sixth European Sociological Association Conference, Murcia.

⁴⁷ Chillias, S. (2010) "Degrees of fit? Matching in the graduate labour market", *Employee Relations*, Vol. 32 Issue: 2, pp.156-170.

⁴⁸ Limited additional searches specifically focusing on degree requirements and job adverts were conducted at a later stage, i.e after the interim report. While it has generated some interesting references, it cannot claim to be searched systematically due to the tight reporting deadline.

⁴⁹ Nesta (2018) *Classifying Occupations According to Their Skill Requirements in Job Advertisements*. ESCoE Discussion Paper 2018-04. (Authors: Jyldyz Djumalieva, Antonio Lima and Cath Sleeman)

⁵⁰ Carnevale, A.P., Jayasundera, T. & Repnikov, D. (2014) Understanding online job ads data. Technical report. https://cew.georgetown.edu/wp-content/uploads/2014/11/OCLM.Tech_Web_.pdf.

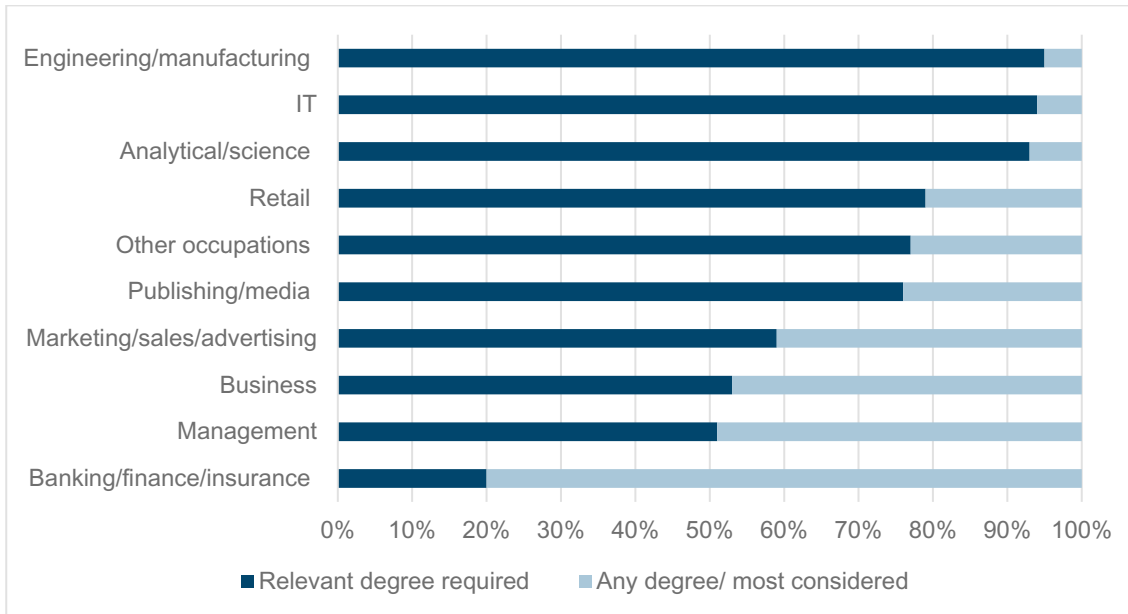
⁵¹ Harper, R. (2012) The collection and analysis of job advertisements: A review of research methodology. *Library Information and Research*, Vol 36, No 112. pp29 -54.

more likely to use online job searches. The educational level required for the job needed to be approximated using other sources in about half of the cases due to lack of information in the job advert itself.

A study undertaken for the Department for Business Innovation & Skills on graduate recruitment used a random sample dataset from the Graduate Recruitment Bureau (GBR), a leading specialist graduate and student recruitment service. It provided detailed information on about 1500 vacancies from 600 employers for the period 2007 to 2013. These vacancies had been filled through GBR and concentrated in particular areas (business services, transport and communications and manufacturing, utilities and construction). The findings indicate that the percentage of relevant degrees required varies by occupation, sector and size of employer. The percentage of vacancies that require a relevant degree ranges from 57% in business services to 94% in public/other sector, and, focusing on occupations, from around 50% in management and business to over 90% in engineering/manufacturing, analytical/science and IT (see Figure 6). Large and medium sized companies were much more likely to require a relevant degree. (Pollard et al., 2015)⁵².

⁵² Pollard E, Hirsh W, Williams, M., Buzzeo J, Marvell R, Tassinari, A. and Ball, C. (2015) *Understanding employers' graduate recruitment and selection practices – Evidence report*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/474254/BIS-15-464-A-evidence-report-employer-graduate-recruitment.pdf

Figure 6: Proportion of vacancies with relevant degree required by occupation, Graduate Recruitment Bureau (GBR) 2007-2013



Source: Pollard et al (2015) based on GBR data, p.93

There is ongoing development work to harness the wealth of online jobs postings to provide labour market information, yet they explore different or partial venues. For example, Nesta, in collaboration with partners, is in the process of developing a new four-layer system for classifying occupations according to their skill requirements in job adverts. Based on 37 million online adverts, the system develops layers of skills specialisations and uses salary data as an indication for skill level required (while also capturing data on years of education). While arguing the need for a new system that captures employer requirements, one consideration in their decision to adopt a new system has been that online job adverts cannot easily be coded to SOC categories (Nesta, 2018)⁵³. Funded by Cedefop, Boselli and colleagues (2017⁵⁴) have developed a system for classifying job adverts according to The International Standard Classification of Occupations (ISCO) codes in 5 countries, called WoLMIS, and are now extending this work to 28 EU countries. It is not known though whether this system has the potential to provide information on the extent of relevant degree requirements for occupations.

⁵³ A prototype of the skills map based on automated job advertisements is available from: <https://www.nesta.org.uk/blog/the-uk-needs-a-skills-map/>

⁵⁴ Boselli, R., Cesarini, M., Marrara, S., Mercorio, F., Mezzanzanica, M., Pasi, G., et al. (2017). WoLMIS: a labor market intelligence system for classifying web job vacancies. *Journal of intelligent information systems*, 1-26.

Burning Glass (2014⁵⁵) has analysed degree requirements in US online adverts by SOC codes.

Studies analysing skill requirements based on UK job advertisements, found as part of this review, seem to focus either on occupation-specific requirements (e.g. library and information science) or on particular economic sub-sectors or activities (e.g. supply chain management or marketing). They often use a small-scale sample (in the order of 250 to 500 job adverts) and their research questions are more geared towards exploring the wider range of job requirements and how the demand expressed in job adverts relates to university curricula. Wellman's study (2010)⁵⁶, based on the analysis of a convenience sample of 250 early career jobs advertisements in marketing (e.g. marketing executive, marketing assistant and graduate marketing), found that almost half of the advertised posts required a degree, a fifth of them a marketing degree. Other adverts stated a preference for a business or related degree or specified alternative degrees, such as public relations, statistics or psychology. This mirrors findings reported by Pollard et al. (2015)⁵⁷ reported later.

Relevance of degree requirements – findings from research with employers

The degree subject plays an important role in the recruitment process. According to the CBI/Pearson 2017⁵⁸ survey, based on 340 responding organisations across all sectors, over 60% rank the degree subject as the most important graduate recruitment criterion (particularly in manufacturing: 70%). The study finds that attitudes and aptitudes for work are most important (nearly 90%), followed by work relevant experience (64%).

Drawing on a large qualitative study interviewing employers and stakeholders as part of the above project, Pollard and colleagues (2015)⁵⁹ reported a number of key findings on the relevance of a specific degree. Compared to other European countries, a higher proportion of jobs are open to graduates with any degree, irrespective of their disciplinary background. A high proportion of employers interviewed (around three quarters) looked for subject specific knowledge but this may only apply to some of the jobs for which employers recruit graduates. There was a greater requirement for subject specific degrees in science and engineering. The requirement for a relevant degree varies by job role or function, with a degree in a specific subject area for example being less relevant in human resources or sales. Relevant degrees may become more important in the future

⁵⁵ Op. cit.

⁵⁶ Wellman, N. (2010). "The employability attributes required of new marketing graduates." *Marketing Intelligence and Planning* 28(7): 908-930.

⁵⁷ Op. cit.

⁵⁸ CBI/Pearson (2017) *Helping the UK thrive. The 2017 CBI/Pearson Education and Skills survey.*

<http://www.cbi.org.uk/news/skills-needs-must-now-drive-reforms-cbi-pearson-education-and-skills-survey/>

⁵⁹ *ibid*

in some areas (marketing and financial work was given as an example). It was also found that several legal organisations chose to limit the number of law graduate recruits in order to recruit graduates from a broader range of backgrounds due to their high level of skills. It is not known though what role law specific professional development courses (like law conversion courses) play.

Similarly, Purcell and colleagues (2008)⁶⁰, drawing on qualitative research with employers of chemistry graduates found that specialist chemical employers (e.g. pharmaceuticals or water industry; n=31) were chiefly looking for graduates with a degree in chemistry or in other cases someone with a related degree, such as chemical engineering. Most of the employers in other sectors (e.g. finance and banking or government; n=25) required a 2:1 degree but did not specify a particular subject degree for their graduate programmes although they may have preferences for certain subject areas due to the skills these graduates would bring to the job. Chemistry graduates were recruited where specific technical expertise or certain skills (e.g. logical reasoning or research) were required or where the person was most suited for the specific role.

Relevance of degree requirements - graduate views

Data from large-scale UK based studies following up graduates *1.5 to 3.5 years after graduation*, provide information on both the perceived relevance of the undergraduate degree in a particular subject area and in any subject. Recent survey data show that the perceived importance of a relevant degree is highest among more vocationally oriented subject areas (in particular medicine and dentistry, subject areas allied to medicine and engineering) and lowest in non-vocational subject areas (e.g. historical and philosophical studies and languages) (see Purcell et al., 2013⁶¹; HESA cited in Universities UK, 2016⁶², see Table 2 earlier).

Data from the secondary analysis of Futuretrack data show that overall, just over 40% of jobs held by the graduate cohort were perceived as requiring a specific degree, with the highest percentage found in professional occupations (76%), followed by the associate professional and technical occupations (35%). More detailed occupational breakdowns indicate that the jobs where having a specific degree was seen as a requirement by graduates, was highest among health professionals (93%), followed by science, research, engineering and technology professionals (80%), and teaching and educational

⁶⁰ Purcell, K., Atfield, G. and Ball, C. with Elias, P. (2008) *An investigation of the factors affecting the post-university employment of chemical science graduates in the UK*. Report to the Royal Society of Chemistry. Coventry: Warwick Institute for Employment Research, University of Warwick.

⁶¹ Purcell, K., Elias, P., Atfield, G., Behle, H., Ellison, R., Luchinskaya, D. (2013) *Transitions into employment, further study and other outcomes, The Futuretrack stage 4 Report*, Manchester/Coventry: HECSU/Warwick Institute for Employment Research.

https://warwick.ac.uk/fac/soc/ier/futuretrack/findings/stage_4_report_final_06_03_2013.pdf

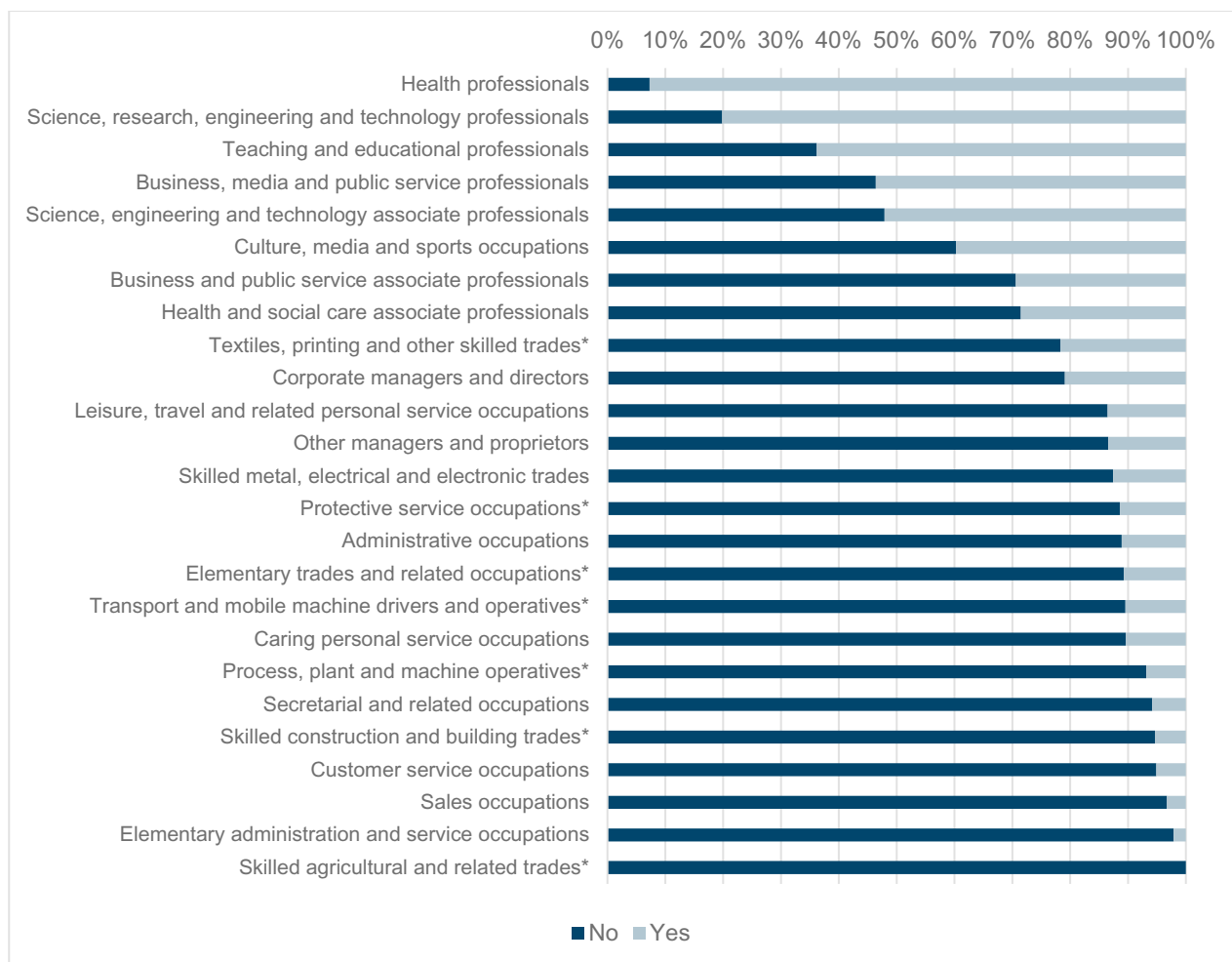
⁶² Op. cit.

professionals (64%). Just over half of jobs held by graduates in the business, media and public service professional occupations, and in the science, engineering and technology associate professional occupations required a degree in a specific subject (see Figure 7). For the remaining occupations, less than half required a specific degree.

The European based Reflex study found that the vast majority of graduates self-assessed *five years after graduation* reported that either only their own field of study (33%) or their own or a related field (55%) were best suited to the job. This differed markedly however between the seven types of professions they developed based on occupational coding, along the lines one would expect. Classical professionals (such as doctors) thought their own field was most suited (81%), followed by semi-professionals (e.g. nurses or teachers) (49%). Most science and technology experts (e.g. engineers), business and social science experts and managers thought that their own or a related field would be most appropriate (above 60%) while this percentage fell to 42% for non-professionals (e.g. clerks) (Allen and van der Velden, 2007⁶³).

⁶³ Op. cit.

Figure 7: Job required a degree in a specific subject (as perceived by graduates) by SOC 2010 sub-major group



Source: Futuretrack Waves 1-4, first-degree UK-domiciled graduates only.

Further analysis of the Reflex study, drawing on 13 European countries and Japan, also indicated that graduates who had completed a more generally oriented programme were at a disadvantage compared to those in more specifically oriented fields of study in terms of gaining a job that requires a degree: they needed more than five years to catch up with their counterparts (Verhaest and Van der Velden, 2013⁶⁴). This, the authors argue could mean ‘that specific programmes are successful in providing an entry ticket to the labour market, whereas general programmes are more successful in helping to develop the

⁶⁴ Verhaest, D. and R. Van der Velden (2013). "Cross-country differences in graduate overeducation." *European Sociological Review* 29(3): 642-653.

career over the long run (650).’ The findings, the authors assert, also align with segmentation theories:

‘Generally educated individuals enter predominantly internal labour markets, where newcomers start at the bottom of the ladder, but which also offer high rates of internal promotions. Specifically educated individuals enter predominantly occupational labour markets, where they can immediately enter matching jobs, but where the occupational mobility is relatively low.’ (Verhaest and Van der Velden, 2012, p.650)

Moreover, the study found that in the UK over education (having a job that does not require a degree) six months after graduation was much higher than compared to the EU average but that over education in the UK had dropped very substantially five years after graduation to a level that was still a bit higher than the average across all countries.

Brendan and Little (2009)⁶⁵, using the same REFLEX data, argued earlier that the ‘broad liberal education’ in the UK may “imply a somewhat looser relationship between that education and subsequent employment requirements” (p.8). Employers, the authors hypothesize, may focus more on the person during recruitment as they provide additional training, with the data showing that relatively more UK graduates than their peers from other countries entered an initial formal training period (23% compared to 15%) and also for a longer time.

Research undertaken by Mountford-Zimdars and Flood (2016)⁶⁶ reports that in the UK the status of the university can be more important than a law degree in gaining access to elite jobs. Most Oxbridge graduates (who gained access to elite jobs) had embarked on a law conversion course, while most of those from other universities had graduated with a law degree. In contrast, in Germany a law degree and university attainment open the way to elite jobs.

Degree requirement for jobs

A secondary analysis of the 2006 Skills Survey found that 29.5% of jobs (own calculation) covered in this survey required a degree and that 34% (own calculation) of those in work who had a degree or post-graduate degree were in jobs they thought required a lower level of qualification on entry to the job than they had (‘over-qualification’). This compares to 38% overall (i.e. including respondents without a degree)

⁶⁵ Brennan, J. & Little, B. (2009) Graduate competences and relationships with the labour market: the UK case. http://oro.open.ac.uk/20897/3/DECOWE_conference_Sept_2009_Brennan_and_Little.pdf

⁶⁶ Mountford-Zimdars, A. and J. Flood (2016). "The importance of university attended and degree subject: a comparison of the background of lawyers in England and Germany." *Higher Education Review* 49(1): 26-49.

who were in jobs that required lower qualifications than the highest ones they had achieved (Sutherland, 2012)⁶⁷.

(b) Where professions / roles do require a relevant degree, is this because of specific skills gained by graduates or simply for selection purposes?

Since the supply of graduates has increased, in the wake of the expansion of higher education, employers can take advantage of this and change their selection criteria.

An analysis of online job advertisements undertaken by Burning Glass (2014) found some evidence of this in some occupations in the United States. An example was entry level IT help desk positions as the job profiles of degree and non-degree holders were seen to be very similar.

'The skill sets indicated in job postings don't include skills typically taught at the bachelor's level, and there is little difference in skill requirements for jobs requiring a college degree from those that do not. Yet the preference for a bachelor's degree has increased. This suggests that employers may be relying on a B.A. as a broad recruitment filter that may or may not correspond to specific capabilities needed to do the job'. Burning Glass (2014, p.2).

There is also some qualitative evidence based on views of graduates (e.g. Behle (2016), drawing on Futuretrack data). A recent study drawing on qualitative interviews with around 100 graduates in the West Midlands found some evidence of credentialism, as many graduates reported the need for additional specialised postgraduate qualifications in order to be short-listed for the jobs they would like to get (Purcell et al., 2017).

3.4 RQ4: Extent of gaining employment in their chosen field and changes in career choices during higher education

While some graduates may have very clear ideas about career choices when they enter higher education, others have yet to develop clearer ideas about the kind of jobs they want to pursue during their degree course, or as it draws to end. A study following up university graduates 2.5 years after graduation, found that the majority (over 60%) either knew exactly what kind of jobs they wanted to pursue on leaving university or had a good idea, while a substantial group (the remainder) had a vague or no idea. It was reported that, on average, much larger shares of graduates from more vocationally oriented

⁶⁷ Sutherland, John (2012) Qualifications mismatch and skills mismatch. In: Education and Training, Vol. 54, No. 7, 2012, p. 619 -632.

courses (such as, medicine and dentistry; engineering and architecture) had a clear idea or good idea about the types of jobs they were seeking, in comparison with their peers who studied arts or social studies and communications⁶⁸. Similarly, the Bristol based Paired Peers Project, asking students in their 3rd year about their career plans and their transition process^{69 70}, found that the cohort ranged from a group of students who had clear career plans, with most of them being 'on track' to pursue them, to a group called 'drifters' who were still exploring their options. Along similar lines, another Bristol based study identified three groups of graduates according to how they approached career planning: drifters (who started their course with vague ideas and started job-hunting late in their third year or later; representing about half of the sample), navigators (pursuing their initial career goals diligently) and explorers (proactively pursuing career planning) (Sumption et al., 2010)⁷¹.

Having a clear career plan when leaving university is one of the three most important factors associated with being in employment or pursuing further studies, alongside having paid work experience (at university or within 6 months of graduating) and pursuing graduate level jobs during the job search, and applying for most jobs while still studying (Shury et al., 2017). Lack of career planning was also identified in a stakeholder survey as one of the reasons for poor graduate outcomes (defined as the percentage unemployed, working in non-graduate roles and with low salaries) among STEM graduates (Wakeham Review, 2016)⁷².

3.4.1 To what extent do graduates gain employment in their chosen field?

Career goals and correspondence of employment with original career choice

Few studies selected as part of this literature review ask directly whether graduates work in their chosen career. An exception is a graduate survey among creative graduates which finds that 32% are in their chosen career (whether working or not) four to six years

⁶⁸ Shury, J., Vivian, D., Turner, C., Downing, C. IFF Research (2017) *Planning for success: Graduates' career planning and its effect on graduate outcomes*.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/604170/Graduates__career_planning_and_its_effect_on_their_outcomes.pdf.

⁶⁹ Bathmaker, A-M, Abrahams, J., Waller, R., Ingram, N., Hoare, N. and, Bradley, H (2017) Getting out. In: Bathmaker, A.-M., Ingram, N., Abrahams, J., Hoare, A., Waller, R., and Bradley, H. (eds) *Higher education, social class and social mobility: the degree generation*. pp 99-122.

⁷⁰ The project has followed up these students 4 years later, with results expected to be published in due course.

⁷¹ Sumption, F. (2010) Research Paper 2: How do graduates' careers develop in Brighton and Hove. In: Pollard, E., Hunt, W., Sumption, F. and Cowling, M (2010). *The Brighton Factor Revisited: Does it work and is it important?* <https://www.sussex.ac.uk/webteam/gateway/file.php?name=brighton-factor-revisited.pdf&site=3>

⁷² Op. cit.

after graduation, with a further 19% reporting that their career came close to their and 28% reporting they were fairly close. Among those who were not in their chosen career (20% of all) were graduates who had changed careers or who were still uncertain about career choices (Ball et al., 2010)⁷³. Similar percentages were found for the sub-group of craft graduates (Hunt et al., 2010)⁷⁴.

Extent to which jobs are considered part of graduates' long-term career goals

The Planning for success study which followed up a sample of DLHE respondents 2.5 years after graduation by Shury et al., (2017) found that the percentage of those employed in jobs which were related to their longer-term career plans increased from 20% six months after graduation to 36% 2.5 years after graduation. The majority still saw their job as a stepping stone into the work they wanted to do at this stage in their lives (49% and 45% respectively). Those in managerial or professional jobs 2.5 years after graduation were reported to be much more often in jobs which related to their longer-term goals than those in non-graduate jobs (42% compared to 15%).

Extent to which graduates got exactly the job they wanted (proxy)

Similar in tone are the findings from the Futuretrack study which also show marked differences between STEM and non-STEM graduates. Just over 40% got exactly the job they wanted 18 months after completing their studies, STEM graduates more so than non-STEM graduates (49% compared to 37%), and just over 30% took on the job to gain experience to get the job they really wanted, with very little difference among STEM and non-STEM graduates. On the other hand, a large percentage took the job because it was 'better than being unemployed' indicating that they had to compromise in some way, with STEM graduates again faring better than non-STEM graduates (36% compared with 43%) (Purcell et al., 2013)⁷⁵.

A secondary analysis of Futuretrack data also showed that there is great variation between subject areas in terms of graduates getting the job they wanted (see Figure 8), with graduates having studied medicine, subjects allied to medicine and education fairing much better than for example those who studied law, historical or philosophical studies. In general, those who studied specialist vocational subjects (such as Architecture,

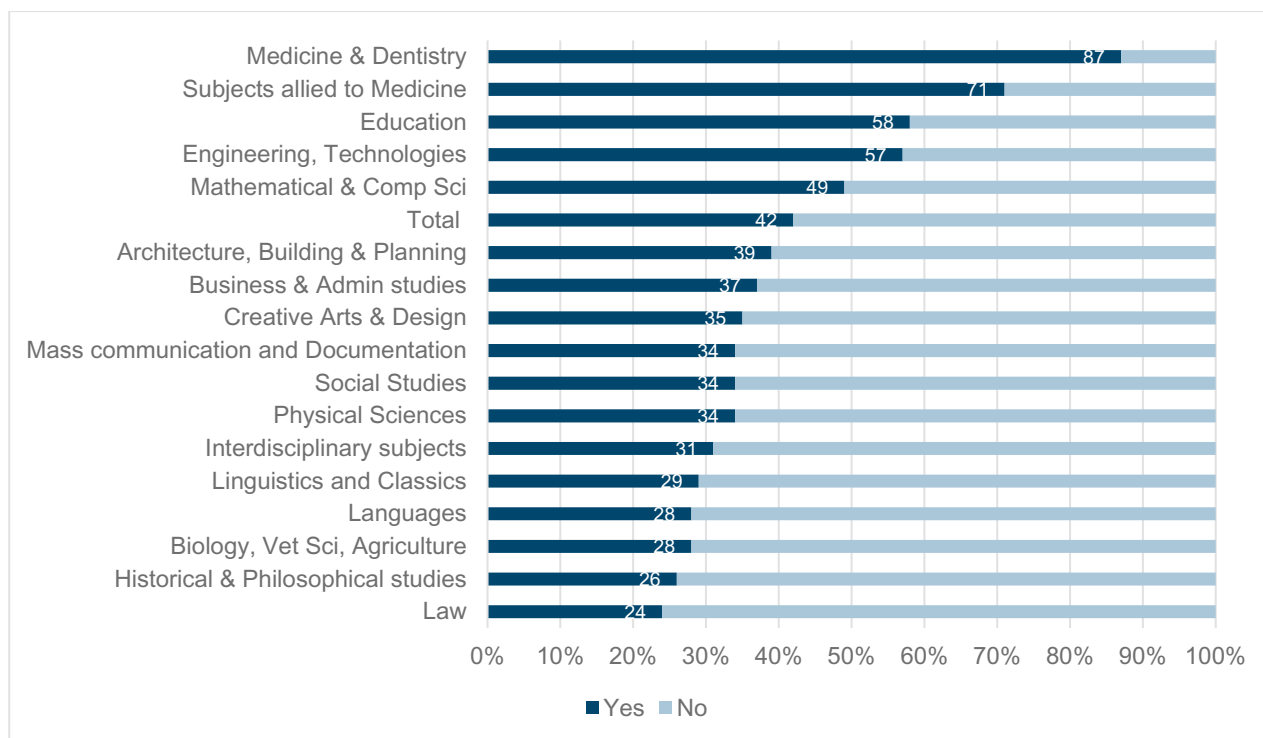
⁷³ Ball, L, Pollard E, Stanley, N. (Jan 2010) Creative Graduates Creative Futures. Available from: <http://www.employment-studies.co.uk/sites/default/files/471sum.pdf>.

⁷⁴ Hunt, W., Ball, L. and Pollard, E (2010) Crafting Futures. A study of the early careers of crafts graduates from UK higher education institutions. Available from: http://www.craftscouncil.org.uk/content/files/crafting_futures_full_report.pdf.

⁷⁵ Op cit.

Building & Planning; Medicine & Dentistry; Education; Engineering, Technologies; and Subjects allied to Medicine) were more often in jobs they wanted than those in occupationally oriented routes and discipline based academic subjects (62% compared to 35% and 30% respectively).

Figure 8: Chose job because it was exactly the type of work wanted by undergraduate subject studied



Source: Futuretrack Waves 1-4, first-degree UK-domiciled graduates only.

Working in the chosen occupational specialisation (medicine)

While those studying a vocational subject will often be undergoing training for a particular profession, they still have to make important choices about their specialisations. Given the need for workforce planning in the health care sector there is more information available about the initial specialism choices of medical doctors and their speciality destinations. Longitudinal studies in the medical profession, predating the changes in training in the wake of the modernisation of medical careers, found that the percentage of those who worked in their chosen specialisation increased over time (from 60% in year 1 to 78% in year 3 and 90% in year 5), with graduates in some specialities faring significantly better than others. Figures reported here are for the most recent cohorts included in the study (1993 and 1996) (Goldacre et al., 2010⁷⁶). There are also a number of publications focusing on single specialties, but these are not covered here, although they may include more recent cohorts.

⁷⁶ Goldacre, M. J., et al. (2010). "Medical Graduates' Early Career Choices of Specialty and Their Eventual Specialty Destinations: UK Prospective Cohort Studies." *BMJ (British Medical Journal)* 341(7764): 139.

Changes in career-related employment over time

Labour market transitions: Changes in the percentage in employment or in graduate jobs over time is not strictly an indicator that more graduates have found employment in their chosen field. However, chances are that this percentage will have increased as well over time as graduates may have gained valuable work experience or obtained further qualifications that may help them to find employment in their area of choice.

Futuretrack's activity history data show that, as more time since graduation lapses, unemployment declines and employment in graduate jobs increases (Purcell et al., 2013). Similarly, secondary analysis of DLHE and L-DLHE data undertaken as part of the Wakeham Review⁷⁷ showed that more STEM graduates were in employment and in graduate jobs (defined here as managers and senior officials, in professional occupations or in associate and technical occupations) 3.5 years after graduation compared to 6 months after graduation, apart from some agriculture related disciplines, where graduate outcomes got worse as time progressed. Similar developments were reported, on average, for all higher education graduates. Findings from a secondary analysis of 2010/11 engineering graduates, in the DLHE and L-DLHE data, show that the percentage of graduates working in engineering occupations increased from 55% 6 months after graduation to 69% 3.5 years after graduation. This was also interpreted as a sign of the easing of the labour market (Royal College of Engineering, 2016⁷⁸). However, there is also evidence that graduates may find it difficult to move out of non-graduate jobs taken on straight after graduation (Behle, 2016⁷⁹).

The state of the labour market: The 2007/08 global recession impacted on the UK labour market and graduate employment making it more difficult for graduates to transition into the labour market, as unemployment figures and the percentage of recent graduates in non-graduate jobs (based on Purcell and Elias, 2013) have shown (c.f. ONS, 2013⁸⁰). To gain a foothold in the labour market and valuable professional experience graduates may have had to take up (unpaid) internships after graduation (see e.g. Bradley et al., 2013⁸¹; Purcell et al., 2017⁸²). A study based on 14 countries (all except one being European) found that graduates entering the labour market during a recession, or facing strong

⁷⁷ Op. cit.

⁷⁸ Royal Academy of Engineering (2016) Employment outcomes of engineering graduates: key factors and diversity characteristics. Author: Dr Robin Mellors-Bourne.

<https://www.raeng.org.uk/publications/reports/employment-outcomes-of-engineering-graduates-key-f>

⁷⁹ Behle, H. (2010) Graduates in non-graduate occupations.

<http://www.hefce.ac.uk/pubs/rereports/year/2016/gradoccup/>

⁸⁰ Office for National Statistics (ONS) (2013) *Graduates in the UK Labour Market 2013*.

http://webarchive.nationalarchives.gov.uk/20160106222643/http://www.ons.gov.uk/ons/dcp171776_337841.pdf

⁸¹ Bradley, H. et al. (2103) The Paired Peers Project (2010-2013). Available from:

<https://www.bristol.ac.uk/media-library/sites/spais/migrated/documents/report.pdf>

⁸² Op. cit.

competition from others who were highly skilled, were more likely to be in a job that did not require a degree six months after graduation. This subsequently affected the probability of getting a degree level job for up to five years after graduation (Verhaest and van der Velden, 2012.)

A secondary analysis of the activity history data from the class of 99 (Moving on) and class of 2010 (three-year degrees) and class of 2011 (four-year degrees) (Futuretrack) showed that, apart from expected differences in employment rates, the former moved quicker out of non-graduate jobs during the first 15 months after graduation and were less often in persistent non-graduate jobs during that time period than the latter (13.4% compared to 18.9% and 15.5% respectively). Employment rates in non-graduate jobs varied, e.g. by subject groups and industry. There is also evidence that non-graduate jobs may not prove to be a stepping stone into graduate jobs for some and that this results in frustration for those affected (Behle, 2016⁸³).

Career changes after graduation: Career decisions are not a one-off process, rather they may evolve over time as circumstances change (e.g. family formation). Ball et al. (2010) reported that four to six years after graduation, about half of the creative graduates surveyed had pursued the career goal they had at graduation and more than a third had changed their career plans, most to a different career within arts, and a smaller but substantial group to a career outside of arts, including teaching. Looking ahead to the next five years, the vast majority aim to stay in the same career (in the same or higher post). The majority aim to be self-employed or working freelance and a substantial group envisages to change career direction or doing something completely different.

Specialty career changes of medical doctors have been reported earlier.

3.4.2 To what extent do graduates change their minds about their career choices during their studies?

This section first explores the extent of changes in career choices while studying and then the extent of dropout rates from higher education, as these also indicate significant career changes.

Clarity of career plans by subject area

Based on the self-assessed clarity of career plans when entering university by subject area and other variables, Purcell et al. (2008) developed a useful typology, taking into

⁸³ Op. cit.

account the degree of vocationality of the course and how this is likely to play out in terms of their career choices.

Typology of career plans and vocationality of subject area

- *“[courses] that are clearly most often specialist vocational ones – Medicine, Education, Subjects allied to medicine, and Architecture and related, Law, and Engineering and Technologies – where the skills and knowledge acquired on courses is geared to development of a particular professional occupational corpuses of knowledge and where over 60 per cent of accepted applicants had a clear idea of occupational orientation;*
- *[courses] that are occupationally-orientated routes within more general areas of study which varies within the broad group according to particular courses, and where well over 40 per cent of respondents claimed to have clear career trajectories in mind; creative Arts and Design through to Mathematical and Computing Sciences (and this category is likely to divide into two as course progress, ideas about options change, and the realities of employment opportunities are encountered);*
- *the remainder, which again, may or may not contain two distinct sub-groups – where the focus of study, in terms of knowledge, is more likely to be intrinsically rather than extrinsically-focused, and the skills are general transferable skills rather than specialist occupational ones.”*

Source: Purcell et al. 2008, pp.22-23⁸⁴

The authors recognise though that a small group of individuals may not fit this pattern as they may have different aspirations about the type of career they want to pursue compared to the prevailing pattern.

Changes in subject area in the first year

The Futuretrack study found that the percentage of those who were registered in a different subject area about a year after entering higher education varied by subject area: it was lowest in medicine and dentistry (0.7%) and highest in e.g. languages or combined areas (ranging between 11% and 13%). It was also observed that the percentage of those no longer being registered at a higher education institution was again lowest in medicine (1.6%) and that differences in subject areas were less pronounced (with mass

⁸⁴ Op. cit

communication found to have the highest rate: 5%). The study also discovered that where course changes occurred they most often involved changing the subject, with students often moving to a similar one. This, the authors argue, may be one of the underlying reasons for fewer changes in medicine and dentistry and other vocational areas as there are no similar subjects and another one being that these courses are essential if students want to practise in the area (Purcell et al., 2009)⁸⁵.

Changes in career clarity and career plans over time⁸⁶

Making career decisions can be challenging and involve stress and negative feelings (see e.g. literature cited in Nachmias and Walmsley).

Shury and colleagues (2017) found that about a third of graduates had clearer career plans when leaving university compared to their initial career ideas when entering university while for about one in two (55%) no changes in clarity had occurred. In contrast, the Futuretrack study observed that the proportion of those who had clear longer-term career plans changed very little between entering higher education and 18 months after graduation, perhaps also reflecting degrees of uncertainty in a restricted labour market, as the authors suggest (Purcell et al., 2013⁸⁷).

While some degrees directly prepare students for particular occupations, students still need to consider their career options. An Australian longitudinal study following nursing students over three years reported that those who were unsure of their career plans dropped from 39% in the first year to 3% in the third year of study. Looking at aggregate figures, preferences for specialisms/areas of work also changed over time. The authors suggested that this is likely to be attributed to 'theoretical and clinical exposure' and the curriculum itself (McCann et al, 2010)⁸⁸.

Elsewhere there is also some evidence that work experience or wider exposure to potential areas of work itself has an impact on graduates' career plans. The Planning for success study reported that graduates with work experience were more likely to have consolidated their career plans while at university (Shury et al., 2017)⁸⁹. A small qualitative study undertaken as part of a larger study on chemistry graduates found that the biggest changes in career plans related to the branch of chemistry sciences as students were exposed to a broader range of branches during their study and chose the one they enjoyed most (Purcell et al., 2008)⁹⁰. The initial findings of an ongoing small

⁸⁵ Op. cit.

⁸⁶ The ongoing Careers Registration project, led by the Careers Group, may provide some relevant data in future.

⁸⁷ Op. cit.

⁸⁸ McCann et al. (2010). "Bachelor of Nursing students career choices: a three-year longitudinal study." *Nurse Educ Today* **30**(1): 31-36.

⁸⁹ Op. cit.

⁹⁰ Op. cit

qualitative longitudinal study in New Zealand (Mooney and Jameson, 2018)⁹¹ indicate that first-year hospitality students appear to change their career plans after a negative experience of working in the sector. Moreover, the study reports findings from other studies showing that many hospitality students do not choose to embark on a hospitality career after graduation. Similarly, Nachmias and Wamsley (2015)⁹² found that the propensity of UK hospitality students to work in the hospitality sector was negatively impacted after they had sampled the realities of working in the industry during their studies.

There is also some qualitative evidence that women change their career ambitions during their studies in anticipation that this may help them combine work and family life after graduation (Bradley, 2017; Bathmaker et al, 2017)⁹³.

Extent of dropout from higher education (first degree)

Drop outs from higher education can be temporary, as students return to higher education at a later point in time, or permanent. Detailed data on non-completion rates of UK domiciled first degree students are regularly produced by the Higher Education Statistical Agency (HESA) as part of the UK Performance Indicators. HESA data for full-time students 2015/16 show that the dropout out rate during or at the end of the first year was 7.5%, lower for young people (6.4%) than for mature students (11.6%), and that about 1 in 5 returned after a year out, young people more often than mature students (22.1% compared to 16.6%)⁹⁴. In contrast, dropout rates for part-time students two years into their course were much higher (34.2%). Figures on projected outcomes for full-time students, based on similar progression patterns⁹⁵, indicate that around 1 in 10 starters in 2015/16 are projected to neither achieve an award or a degree (down from 15% in 2000/01) while 3.9% are projected to obtain another award and 5.3% to transfer to another higher education institution and 3.9% to obtain another award (HESA, 2018)⁹⁶.

A comparative study found that the dropout rates in Britain are the lowest across the 14 EU countries covered in the study (14%) and that the re-entry rates into higher education were in line with the EU average (38%). While dropout rates were also reported to be

⁹¹ Mooney, S. & Jameson, S. (2018). "The career constructions of hospitality students: A rocky road." *Hospitality & Society* 8(1): 45-67.

⁹² Nachmias, S. and A. Walmsley (2015). "Making career decisions in a changing graduate labour market: A Hospitality perspective." *Journal of Hospitality, Leisure, Sport & Tourism Education* 17: 50-58.

⁹³ Op. Cit.

⁹⁴ <https://www.hesa.ac.uk/news/08-03-2018/non-continuation-summary>

⁹⁵ For methodological details see <https://www.hesa.ac.uk/data-and-analysis/performance-indicators/outcomes/technical>

⁹⁶ HESA (2018) *Non-continuation-summary: UK Performance Indicators 2016/17*. <https://www.hesa.ac.uk/news/08-03-2018/non-continuation-summary>

relatively low in Norway (17%) and France (19%), they were highest in Italy (33%) and the Netherlands (31%) (Schnepf, 2014, cited in Bradley, 2017)⁹⁷.

A longitudinal study of Bachelor of Nursing students at one university in Australia (Salamonson et al., 2014⁹⁸) found that after the 1st year 12% dropped out, rising to a total of 31% in the third year and a total of 34% at the end of the sixth year (the maximum time allowed), with attrition rates of between 20% to 40% having been reported elsewhere. Moreover, the study revealed that those who have not chosen nursing as a first career choice dropped out more often, but only the figures in the 6th year were found to be significant; and those working more than 16 hours per week during the semester were also found to be more likely to drop out.

⁹⁷ Schnepf, S. (2014) Do tertiary dropout students really not succeed in European labour markets? Discussion paper no 8015, Social Science Electronic Publishing. <http://ftp.iza.org/dp8015.pdf>. Bradley, H. (2017). "Should I stay or should I go?": Dilemmas and decisions among UK undergraduates." *European Educational Research Journal* 16(1): 30-44.

⁹⁸ Salamonson, Y., et al. (2014). "Nursing as first choice predicts nursing program completion." *Nurse Education Today* 34(1): 127-131.

3.5 RQ 5 and 6: Effect of studying for passion on career success, perception of career success and happiness

- Question 5: What does the effect of studying for passion/personal fulfilment/career calling have on perceptions of career success?
- Question 6: What role does making a choice based on passion/personal fulfilment/career calling have on happiness/contentment with career and career success?

Literature searches focusing on passion/personal fulfilment/career calling and (personal or career) values do not address the research questions directly. Much of the research found centres on career calling, a concept that has as yet no generally agreed definition although there are commonalities (c.f. Hirschi, 2011)⁹⁹.

The literature typically falls into one of three categories:

- Studies reviewing the concept of career calling and/ or conducting research operationalising it (e.g. Elangovan et al., 2010¹⁰⁰; Hagmaier and Abele, 2012¹⁰¹; Duffy et al. 2015¹⁰²; Praskova et al. 2015¹⁰³);
- Studies investigating the extent of career calling among undergraduates or where career calling features (e.g. Ng et al., 2008¹⁰⁴; Duffy and Sedlacek, 2010¹⁰⁵; Hirschi, 2011¹⁰⁶; Bott and Duffy, 2015¹⁰⁷; Mooney and Beckett, 2018¹⁰⁸); Studies researching the effect of career calling or passion on e.g. job satisfaction or psychological wellbeing. These focus on different groups of working adults (e.g.

⁹⁹ Hirschi, A. 2011. Callings in career: A typological approach to essential and optional components. *Journal of Vocational Behavior*, 79, 60-73.

¹⁰⁰ Elangovan, A. R., et al. (2010). "Callings and Organizational Behavior." *Journal of Vocational Behavior* 76(3): 428-440.

¹⁰¹ Hagmaier, T. & Abele, A. E. 2012. The multidimensionality of calling: Conceptualization, measurement and a bicultural perspective. *Journal of Vocational Behavior*, 81, 39-51.

¹⁰² Duffy, R. D., Autin, K. L., Allan, B. A. & Douglass, R. P. 2015. Assessing Work as a Calling: An Evaluation of Instruments and Practice Recommendations. *Journal of Career Assessment*, 23, 351-366.

¹⁰³ Praskova, A., Creed, P. A. & Hood, M. 2015. The Development and Initial Validation of a Career Calling Scale for Emerging Adults. *Journal of Career Assessment*, 23, 91-106.

¹⁰⁴Ng, E. S. W., Burke, R. J. & Fiksenbaum, L. 2008. Career Choice in Management: Findings from US MBA Students. *Career Development International*, 13, 346-361.

¹⁰⁵ Duffy, R. D. & Sedlacek, W. E. 2010. The Saliency of a Career Calling Among College Students: Exploring Group Differences and Links to Religiousness, Life Meaning, and Life Satisfaction. *Career Development Quarterly*, 59, 27-41.

¹⁰⁶ Op cit.

¹⁰⁷¹⁰⁷ Bott, E. M. & Duffy, R. D. 2015. A Two-Wave Longitudinal Study of Career Calling Among Undergraduates: Testing for Predictors. *Journal of Career Assessment*, 23, 250-264.

¹⁰⁸ Op. cit.

MBA graduates: Burke and Fiksenbaum, 2009¹⁰⁹; academics: Gazica & Spector 2015¹¹⁰) or employees of a law enforcement agency (Chen et al 2018¹¹¹) but they do not investigate the impact of study motivation on perceptions of career success.

The findings of two studies targeting graduates are presented below but they are not necessarily representative of the research in this area. They largely attracted middle-aged or older graduates assumed to be in established careers and they do not include measures of objective career success.

Using a range of purposefully adapted validated scales, Burke and Fiksenbaum (2009) found in their exploratory study among former MBA graduates from one Canadian university that those scoring high on passion reported greater work satisfaction and higher levels of psychological wellbeing.

An exploratory cross-sectional study among, on average older, US academics (n=378) reported that those living their occupational calling tended to fare better in terms of job satisfaction, life satisfaction and health than those whose job did not match their calling. They also tended to be more satisfied with their job and life than those who had no calling, yet there were no differences in terms of health outcomes between these two groups (Gazia and Spector, 2015).

It was therefore decided to explore the effect of study motives or career/personal values on career success and perceptions of career success, focusing on the studies identified through the literature review undertaken so far.

While many of these studies gathered information on either study motives, career success and perceptions of career success¹¹², there is no analysis of the effect of study motives on these employment outcomes. Questions on happiness were not found in the main large-scale graduate studies; future research may, however, generate relevant data, as the New DLHE survey makes provision for optional questions on subjective wellbeing (HESA, 2017)¹¹³.

¹⁰⁹ Burke, R. J. & Fiksenbaum, L. 2009. Work Motivations, Satisfactions, and Health Among Managers Passion Versus Addiction. *Cross-Cultural Research*, 43, 349-365.

¹¹⁰ Gazica, M. W. & Spector, P. E. 2015. A comparison of individuals with unanswered callings to those with no calling at all. *Journal of Vocational Behavior*, 91, 1-10.

¹¹¹ Chen, J., May, D. R., Schwoerer, C. E. & Augelli, B. 2018. Exploring the Boundaries of Career Calling. *Journal of Career Development*, 45, 103-116.

¹¹² The New DLHE will introduce a new question about whether the current work is “meaningful and important” to the graduate and this may provide avenues for exploration. (HESA (2017) NEWDLHE: *The future of graduate outcomes data. A consultation on our proposed model* (Authors: Dan Cook and Rachel Hewitt). Available from: https://www.hesa.ac.uk/files/NewDLHE_model.pdf)

¹¹³ Op. cit

Also, study motivation is operationalised in a different way. Looking at two large-scale national graduate surveys, response categories 'closest in nature' to the above questions are 'enjoying studying the subject area' (the main reason for nearly 40%; Purcell et al., 2008)¹¹⁴ or 'enjoyment/interest in the subject area' (identified as the main reason for 44% of graduates; particularly among graduates of Arts and Creative Art and Design courses but less so among those having studied Business, Law, Education or Medicine and Dentistry (Shury et al., 2017)¹¹⁵. Alternatively, reasons for taking up the current job may be of interest, with the category closest in nature being 'a job that interested me.'

Additional secondary data analysis using Futuretrack data explores the outcomes of studying for enjoyment on career success in terms of salary as an objective indicator for career success and overall job satisfaction as a subjective proxy indicator for overall personal fulfilment and contentment with their career.

- Graduates on lower earnings (up to £20,000 per year) and those on very high earnings in their current job (nominal figures) were more likely to report that their main reason for choosing to study their subject was that they enjoyed the subject or the topics (around 45%) than those earning between £20,000 and £50,000 per year. In contrast, those earning between £22,500 per year and £44,500 in gross income per year were more likely to have said that they chose their undergraduate course because they needed it to enter a particular occupation (between 32 and 40%), compared to those on lower and higher earnings.
- The proportion of graduates who were highly satisfied with their job (values 1 and 2 on a 7 point Likert scale) was lower for those whose main reason for studying the course was enjoyment or interest in the course compared to those whose main reason was that they needed it to enter a particular occupation (41% compared to 50%) and slightly higher than those who mainly studied because of the perceived good job prospects (36%).

¹¹⁴ Purcell, K., Elias, P., Ellison, R., Atfield, G., Adam, D. and Livanos, I. (2008) *Applying for Higher Education? the diversity of career choices, plans and expectations. Findings from the First Futuretrack Survey of the Class of 2006 applicants for Higher Education*. Manchester: HECSU/UCAS/IER, Available from: https://warwick.ac.uk/fac/soc/ier/futuretrack/findings/futuretrack_2006_stage1_full_report_2008.pdf

¹¹⁵ Op. cit.

Discussion and conclusion

This review has focused on a set of research questions, set within the overall theme of what drives graduate choices in their post-education jobs and careers and how this relates to their decisions while studying,. It draws on published and grey literature in English released since 2005 and a descriptive secondary analysis of pertinent Futuretrack questions where published evidence was scant. Futuretrack is a national longitudinal study tracing UCAS applicants up to 1-2 years after graduation and was conducted at the IER. Many of the research questions were quite specific, with answers often relying on suitable proxy indicators.

One overall theme is that more vocationally oriented degrees are designed to prepare students for entering specific segments of the labour market, a classic example being medicine and dentistry. Once graduates have completed their degree they register with the professional body and have a licence to practise as a doctor or dentist. The subject area of the degree is seen as highly relevant by medical graduates for getting their current job and they have the highest share of graduates reporting that they got exactly the type of job they wanted.

In other areas, such as business and administrative studies and related areas of work, data indicates that jobs requiring a specific degree may be closer to 50% overall, depending on the job role or function, as other subject areas may also be regarded as suitable. Professional qualifications post-graduation also play an important role in some areas, such as accounting. There is also some evidence that relevant degrees may become more important in the future in some of those areas, e.g. marketing or finance. One study found though that there is a relatively low demand for marketing degrees in particular among marketing advertisements for early career jobs.

At the other end of the spectrum, historical and philosophical studies are an area where the relationship between study and labour market is looser with less than half of graduates indicating 40 months after graduation that the type of qualification was formal/important and one in three that the subject area was formal/important and only about a quarter reporting that 1.5 years after the degree they got the job they wanted.

For many individuals, career decision-making evolves over the course of their undergraduate studies. Others will have very clear career ideas as they enter higher education, typically those in more vocationally oriented subjects (such as medicine or nursing). While there is mixed evidence on the extent to which graduates change their career choices during higher education, there is some evidence that practical experience and exposure to a wider range of career choices, through the curriculum or practical experiences, can impact on graduates' career choices. One study found that most people had clear career plans upon leaving university and that having a clear career plan was one of three key factors influencing graduate outcomes (Shury et al., 2017). Similarly, a

review among STEM graduates found lack of career planning negatively impacted on graduate outcomes (Wakefield Review, 2016).

While research on career calling has been undertaken in recent years, its relevance for graduate career decision making and its impact on graduate careers is under researched. Graduate studies focus on a set of subjective and objective outcomes (including for example job satisfaction) but the review has not identified any literature that focused specifically on happiness or wellbeing. It is understood though that the first NEW DLHE survey to be conducted at the end this year makes provision for an optional question in this area.

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