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What do researchers want to do?

The career intentions of doctoral researchers

2012

Vitae is supported by Research Councils UK (RCUK),
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What do researchers want to do?
The career intentions of doctoral researchers

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The survey on which this report is based originated in a research study for the Department for Business, Innovation & Skills (BIS). Limited results for doctoral researchers in science, technology, engineering and mathematics (STEM) disciplines were included in that report (STEM graduates in non-STEM jobs, 2011). We are grateful to BIS for permission to extend the survey to all disciplines and analyse the resultant data within the context of this wider project.

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Outline

Over 4,500 current postgraduate researchers undertaking doctoral degrees responded to a dedicated online survey in 2010. The study aimed to investigate the career intentions and aspirations of doctoral researchers, their career decision-making to date and what influenced those decisions.

Responses were received from postgraduate researchers in 130 UK universities and research institutes. Sufficient numbers were obtained to make comparisons between those in different research discipline groupings and stages of programme, and between full-time and part-time doctoral researchers. The relatively large sample size and good comparison of certain demographic parameters with those in the national cohort suggest that the sample was representative of doctoral researchers in the UK, although with some over-representation of those with Research Council funding.

Career trajectories to postgraduate research

The responses in this study showed that doctoral researchers in different disciplines displayed significant variations in their age, mode of study and career trajectories prior to postgraduate research. They confirmed that, overall, only a minority undertake doctoral research directly after a first degree. The majority enter research either from a Masters degree or from long-term employment, however, the respective proportions varied strongly with the research discipline.

The picture for part-time respondents was different, with the majority in all disciplines, except arts and humanities and physical sciences, having progressed from long-term employment and only a very small minority directly from an undergraduate degree.

The nature of these varied trajectories of respondents prior to undertaking postgraduate research in different research disciplines had to be taken into account when investigating their career intentions, career decision-making and related activities.

Current career intentions

Even in the later years of their doctoral programmes, only around a third of respondents had definite ideas about their future careers, and about a fifth had little or no idea. Of those who did have definite or reasonably well established ideas, the great majority of doctoral researchers definitely (63%) or probably (28%) intended to pursue occupations or careers related to their research discipline. This applied almost irrespective of the career direction they sought.

Overall, nearly half of respondents with well-established ideas aspired to a career in higher education and a quarter in research outside of the higher education sector; the latter appeared to be the next alternative for many considering a higher education career. However, the overall position masked significant variations by discipline. Three quarters of respondents from the arts and humanities, and over half in social sciences or education, sought a higher education career, while in biological sciences the most popular direction was research outside of higher education.

Only in biomedical sciences and engineering and technology were significant proportions of respondents (over 30%) anticipating careers outside research, although mostly in occupations and sectors which they saw as related to their research disciplines.

For respondents that intended to pursue an occupation related to their research, researchers' career intentions were dominated by their continued interest in the field and their desire to apply their specialist knowledge and high-level skills. They reported career-related issues, such as job availability, remuneration or prospects for progression, to be secondary factors. On the other hand, these career-related issues were much more significant for those who were unsure about their career direction than for those with more established career plans or ideas. For the fewer than 10% of respondents who actively intended to pursue a new direction, these factors can be significant drivers, but they were as, or more, likely to have been attracted by interest in the new direction, and a very few had simply not enjoyed their research.

Choosing postgraduate research

Fewer than one in six doctoral researchers in this study had well-formed career ideas when they had started their undergraduate degree course, and over half had only a vague idea of possible careers or no idea at all. In this respect, the extent of their career thinking seemed to be no different from that of undergraduates more widely[1]. Of respondents that did have ideas, very few (13%) were then thinking about a career in higher education, and only a further 25% about research outside higher education; so the majority had not been consciously thinking about a career in research during their undergraduate studies.

From this it can be inferred that, for most, the attraction of research developed during their university years, and not prior to higher education, which coincides with the time that they are targeted by corporate graduate recruiters looking for 'strong' graduates. Recognition of this potential competition for the most talented graduates, and how few undergraduates were thinking about a research career, may be useful in considering how to assure the future supply of high-calibre graduates into research, particularly with the potential impact of higher undergraduate fees and some employers' offers to counter this.

The overwhelming majority in this study chose to undertake doctoral research for intellectual curiosity and interest, and a desire to develop more specialised knowledge and expertise, while a minority had seen it as necessary for the career to which they aspired. This varied by discipline, with more of those in biological sciences (41%) and least of those in engineering and technology (30%) thinking it would help them to pursue the long-term job that they wanted.

Fewer than a tenth of final-year postgraduate researchers seemed dissatisfied with their choice to undertake doctoral research, although only 70% reported that they would choose the same or similar doctoral research programme again. The proportion that would choose the same programme again declined slightly with length of study; with those in their first year being most positive, while the proportion who would not undertake postgraduate research at all rose to one in ten in their final year.

[1] CRAC (2011) STEM graduates in non-STEM jobs. London: Department for Business, Innovation & Skills
www.bis.gov.uk/assets/biscore/further-education-skills/docs/s/11-771-stem-graduates-in-non-stem-jobs.pdf

Value of the doctorate

Nine out of ten postgraduate researchers in this study thought their doctorate would be essential (54%) or make a difference (33%) in achieving their career aspirations. This was expressed most strongly by those intending to pursue a career related to their research field, and only varied modestly for those considering occupations outside higher education and research.

Careers advice and employment applications

Just under one third of UK final-year doctoral researchers had used their institutional careers service as postgraduates; a substantially smaller proportion than did so as undergraduates, and less than their international peers. At the same time, two thirds felt that they would have benefited if they had used such a careers service at some stage, and a slightly higher proportion still of female researchers.

Of those respondents who had used their university careers service as postgraduates, three quarters had found it very helpful (25%) or helpful (51%), irrespective of their current discipline, career intention or study mode.

Relatively few respondents had actually applied for specific jobs or positions even during the later stages of their research, suggesting that most leave it until after completion of their doctorate. The majority of those who did have job offers prior to completing their doctorate were entering postdoctoral research positions in higher education.

Work experience

The extent of work experience related to their postgraduate research, undertaken by doctoral researchers in this study, varied strongly between respondents in different disciplines. Most respondents in education and social sciences claimed to have postgraduate work experience related to their doctoral study, even those without prior long-term employment, but this was the case with only a minority of respondents from biological and physical sciences. This seems to be the reverse of the position when they were undergraduates, when the highest proportions with degree-related work experience were in engineering and the sciences. In other recent studies, over half of final year postgraduate researchers in sciences claimed to have undertaken degree-related work experience[2]. Around a quarter of doctoral researchers appeared to have had no structured work experience during their higher education years.

Of respondents who had undertaken related work experience as a postgraduate researcher, four out of five reported that the experience had had an effect on their career plans. Given this and the wider perceived value of structured work experience in developing an understanding of non-higher education employment and employability skills, it seems particularly important to understand why so few biological and physical sciences researchers, compared to other disciplines, undertook structured work experience as postgraduates.

Conclusions and recommendations

This study confirmed that the great majority of doctoral researchers were satisfied with their decision to undertake postgraduate research, and wished to pursue careers and occupations which were related to their research discipline and utilise their high level knowledge and expertise.

Their choice to undertake research was largely aspirational rather than pragmatic and their future career thinking appeared to remain so. It was amongst respondents who were considering careers beyond research that issues such as job availability, career prospects and reward were more prominent, although a decision to change direction completely tended to be driven by new interests and aspirations.

Most respondents believed that their doctoral qualification and experience would be essential or very helpful in achieving their desired career. However, satisfaction with the choice to undertake research declined slightly with length of study, and there was some evidence from the workplace of the lesser value of the qualification.

Recommendation: Further longitudinal research into the value of a doctoral qualification in relation to obtaining employment and progression beyond four years should be conducted to give researchers a fully balanced view of the value of their qualification as they consider career directions and opportunities.

A minority of respondents seemed to make use of their university careers service, yet most of those who do use it report that it is useful, and, on reflection, the majority of respondents thought it would have been useful to use it.

Recommendation: Institutions, and especially career services, should consider how to encourage doctoral researchers to use the information, support and advice available to them through the careers services, and to engage earlier and more proactively to achieve their career aspirations.

The vast majority of respondents who had work experience related to their postgraduate research reported that it had had an effect on their career thinking, but the proportions undertaking placements varied greatly by discipline and, particularly within the sciences, were much lower than for undergraduates.

Recommendation: Institutions should consider how to develop, provide and promote opportunities for work placements and create opportunities for researchers in all disciplines to interact with businesses and other external organisations.

The doctoral cohort in this study was very heterogeneous, with researchers in different disciplines having differing profiles and very varied career trajectories and experiences prior to their doctoral research. Only a minority progressed directly from first degree to doctoral research. When they first entered university, few respondents had a clear plan or intention to pursue a career in research or higher education. The desire to pursue research developed during higher education.

Recommendation: In order to assure a flow of talent into research in higher education and beyond, government, funders and institutions should consider how most effectively to promote research careers to young people.

Recommendation: Institutions should explore how to promote doctoral research opportunities and research careers to high-calibre students, amongst the range of career options open to them, in the light of potentially increasing levels of student debt.

[2] CRAC (2011) STEM graduates in non-STEM jobs. London: Department for Business, Innovation & Skills
www.bis.gov.uk/assets/biscore/further-education-skills/docs/s/11-771-stem-graduates-in-non-stem-jobs.pdf

2 Context and introduction

A doctorate is the highest qualification routinely available from UK universities, awarded to recognise research which is undertaken with a high degree of independence. The research has to deliver a significant and original contribution to knowledge, worthy of peer-reviewed academic publication, and the candidate is required to demonstrate in-depth knowledge of the discipline.

The number of doctoral research programmes in the UK, and of doctoral researchers undertaking them, has grown in recent years. This is in part relates to the development of the UK economy, which is becoming increasingly dependent on knowledge-intensive industries and occupations. National quality assurance mechanisms have been developed for doctoral programmes, and there is increasing collaboration between universities and with industry.

The Roberts review ('SET for success') in 2002[3] was undertaken in response to a recognition of the potential contribution that could be made to the UK economy and society by individuals with high level skills and qualifications in science, technology, engineering and mathematics (now known as the STEM disciplines). Critically, it recommended that the benefit of a supply of people with such skills would be greater if they were equipped with better personal and transferable skills, to augment their technical knowledge. This was the catalyst for much more attention to and training in personal and career development skills.

Since that time graduates undertaking doctoral research programmes in the UK have had much more access to training and development opportunities, supported by the national UK GRAD and current Vitae programmes, and requirements for skills are articulated in national quality assurance practice[4] and statements. The continued focus on developing researchers' skills has been recognised as crucial to the future of the UK's competitiveness in an increasingly globalised and knowledge-intensive economy, in Lord Leitch's review of skills[5] and Sir Adrian Smith's recent postgraduate review[6].

With this increased attention on doctoral researchers, a series of underpinning research studies has been conducted to understand the impact of those with research-level qualifications and the impact of the skills they have developed through the training and support programmes, on the economy, society and the individuals themselves. Amongst this research has been Vitae's series of studies in relation to the career destinations of doctoral graduates ('What do researchers do?')[7]. This has provided increased understanding of the occupations entered by doctoral graduates and the career paths that they follow.

This new study aimed to extend knowledge in relation to the career development of doctoral researchers by investigating their career intentions and the attitudes and perceptions that drive their career decision-making. Its principal objectives were to understand the career-related ideas and aspirations of doctoral researchers, and how these had been formulated through their education and careers to date. It was hoped to investigate how this might vary with different characteristics and backgrounds of researchers, not least the discipline in which they conduct research. It could also provide some idea of how doctoral researchers' career aspirations relate to the opportunities that actually exist in the labour market, and thereby provide feedback into the structures that support and influence their career thinking.

It was also hoped that the background information about respondents generated would be useful in developing a better understanding of the make-up of the UK doctoral researcher cohort.

[3] Roberts, G (2002) SET for success: the supply of people with science, technology, engineering and mathematics skills. London: HM Treasury webarchive.nationalarchives.gov.uk/+/http:/www.hm-treasury.gov.uk/set_for_success.htm

[4] www.qaa.ac.uk

[5] Leitch, S (2006) Prosperity for all in the global economy – world class skills. London: HM Treasury www.official-documents.gov.uk/document/other/0118404792/0118404792.pdf

[6] Smith, A (2010) One step beyond: making the most of postgraduate education. London: Department for Business, Innovation & Skills www.bis.gov.uk/one-step-beyond

[7] www.vitae.ac.uk/wdrd

3 Methodology and sample obtained

These findings were derived from responses to an online questionnaire from a sample of those undertaking doctoral research in the UK, across all disciplines, in March and April 2010. Potential respondents were invited to participate through a combination of outgoing email invitations, additional notices issued by contacts in Vitae Hub institutions and networks, and a notice on the Vitae website.

3.1 Responses and key sample characteristics

A total of 4,550 doctoral researchers responded to the survey, resulting in a final sample of 4,298 responses for analysis. The attraction strategy included targeted emails to Research Council funded postgraduate researchers (which resulted in about 40% of responses); this is likely to be reflected in the characteristics of the sample obtained. The following is a very brief overview of those characteristics (a full treatment is given in the Appendix):

- Roughly two thirds (65%) of respondents were from the UK, the rest split almost equally from the European Union/European Economic Area (EU/EEA) countries and the rest of the world (RoW), although respondents from the RoW made up almost a quarter of respondents in engineering/technology and social sciences.
- Just over half (55%) were in their first or second year, 12% in the third year of four and 33% in their final year; in many analyses the latter two groups were combined. Responses from those studying part-time were coded to the roughly equivalent stage.
- Respondents' disciplines of research study were coded to seven broad discipline groups (Table 3.1), chosen partly to facilitate comparison with career-related data for postgraduates and higher education research staff.
- Overall, 45% of respondents were male and 55% female. This masked considerable variation with discipline, with only 27% of engineering/technology and 43% of physical sciences respondents being female.
- Two thirds (68%) of respondents were aged 30 or under; this was 80% of full-time respondents but only 30% of those studying part-time. Nearly half (48%) of UK respondents studying part-time were aged over 40, compared with 8% of those studying full-time.
- The youngest profiles of respondents were in physical and biological sciences, with over 80% aged under 30 years, and the oldest in education and social sciences. UK researchers were generally younger than those from the EU/EEA or RoW (median ages: UK 26 years, EU/EEA 28 years, RoW 29 years), but the UK researchers' ages were more widely spread.
- Respondents were studying at 130 universities and research institutes, including all Russell Group and 1994 Group institutions. 56% of respondents were at a Russell Group institution, 23% at a 1994 Group institution and 22% at other universities and research institutes, although the proportions varied somewhat with discipline.
- The vast majority (96%) of respondents were studying for a PhD/DPhil rather than a professional doctorate; professional doctorates were concentrated in education (29%) and in engineering/technology (13%).
- Some 13% of respondents were studying part-time, ranging from 52% in education to 5% in physical sciences.
- Unsurprisingly, given the sourcing of contacts data from Research Councils for this study, the proportion of respondents with Research Council funding was high (68%), and a high percentage (80%) of respondents reported a single funding source. The majority of those studying part-time were at least partly self-funded. Funding sources varied quite widely with nationality and discipline studied.

Table 3.1 Total respondents, by discipline group

Discipline	Arts and humanities	Biological sciences	Biomedical sciences	Physical sciences	Engineering /technology	Social sciences	Education	Total
N	722	620	686	997	541	558	174	4298
%	17	14	16	23	13	13	4	100

3.2 Representativeness

Comparison of respondents' characteristics with known statistics for the total UK cohort suggested that the sample is representative of doctoral researchers in the UK. Some over-representation of those studying physical sciences and engineering/technology probably reflected the strong response rate achieved from Research Council funded postgraduate researchers. This could also have resulted in relative under-representation of RoW researchers and also part-time researchers, many of whom were funded in other ways. An overall response rate cannot be calculated because, due to the use of multiple networks, the total number of invitations sent is unknown.

A random sample of this size (4,298 respondents) from a total cohort of around 82,000[8] undertaking doctoral programmes in the UK[9] would indicate an expected confidence interval of about 1.5% at a confidence level of 95%. The relatively large samples in each of the discipline groupings, at different stages of study and of both full- and part-time researchers, was reassuring given that much of our analysis focuses on differences between these groups, rather than on deriving aggregate results for all respondents. Final-year respondents (c.1,400) could be considered a particularly strong sample, as it represents a significant proportion of a single year of qualifiers (c.17,500, reported for 2008-09 by HESA).

[8] HESA figure excludes those 'writing up or on sabbatical'

[9] HESA (2010) Resources of Higher Education Institutions 2008/2009. Cheltenham: Higher Education Statistics Agency www.hesa.ac.uk

4 Career intentions

A principal aim of the study was to understand the aspirations of doctoral researchers in relation to their future careers, and how these have developed. This section attempts to establish the extent to which career ideas were held ('strength') and their nature (occupational or career 'direction'). These were considered in terms of broad occupational sector and also how they related to the respondents' research discipline. The reasons underlying career intentions were explored, as well as the actions researchers were taking to achieve their career goals, along with their perceptions of how their doctoral qualification would support them.

4.1 Strength of career ideas

In order to establish the nature of the career intentions of respondents, it was necessary first to establish the extent to which they held well-developed career ideas at all, or whether their ideas were not well-formed.

At the time of the survey, about a third of all final-year respondents had a definite career in mind, while almost half were considering several alternatives (Figure 4.1). Roughly one in six had either only a vague idea of possible careers (13%) or no idea at all (3%). Compared with figures obtained for final-year science, technology, engineering and mathematics (STEM) undergraduates[10], this appeared to suggest that doctoral researchers were no more definite than undergraduates about their career ideas, although fewer of them (one in six, compared with one in four final-year undergraduates) had only vague ideas or no ideas at all.

Final-year respondents from the rest of the world (RoW) tended to be more definite than those from the UK. A higher proportion (42%) had a definite career in mind, while 12% only had vague ideas (and almost none had no ideas). The situation for the European Union/European Economic Area (EU/EEA) respondents was similar to that for UK nationals, but with a slightly lower proportion definite about their ideas.

This variation paralleled survey data for research staff[11], where those from outside the UK were more 'career-decided' and committed to higher education research careers than UK research staff. It may reflect, unsurprisingly, that many of those from outside the UK and Europe have had to make a greater commitment to pursue research, including physically relocating to the UK, than have UK-domiciled researchers. It might also reflect that, in this sample, RoW researchers tended to be somewhat older and could be at a different stage in their career thinking.

There was also slight variation by discipline group, with the highest proportion of final-year researchers in the arts and humanities having a definite career in mind and the lowest proportions in engineering/technology and physical sciences (see Figure 4.2).

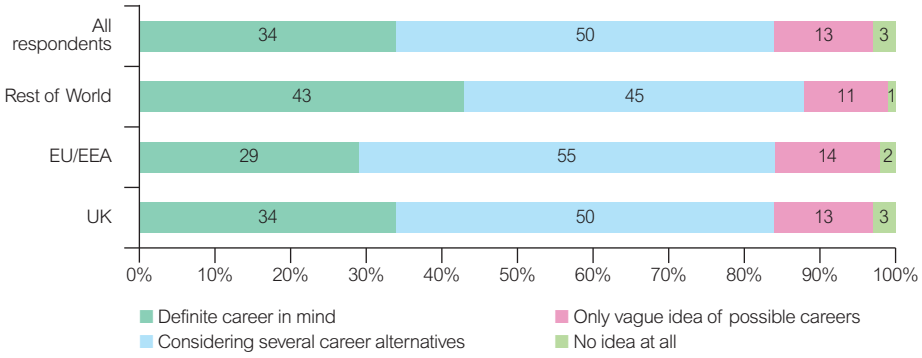

Figure 4.1 Strength of career ideas, by nationality: final-year respondents

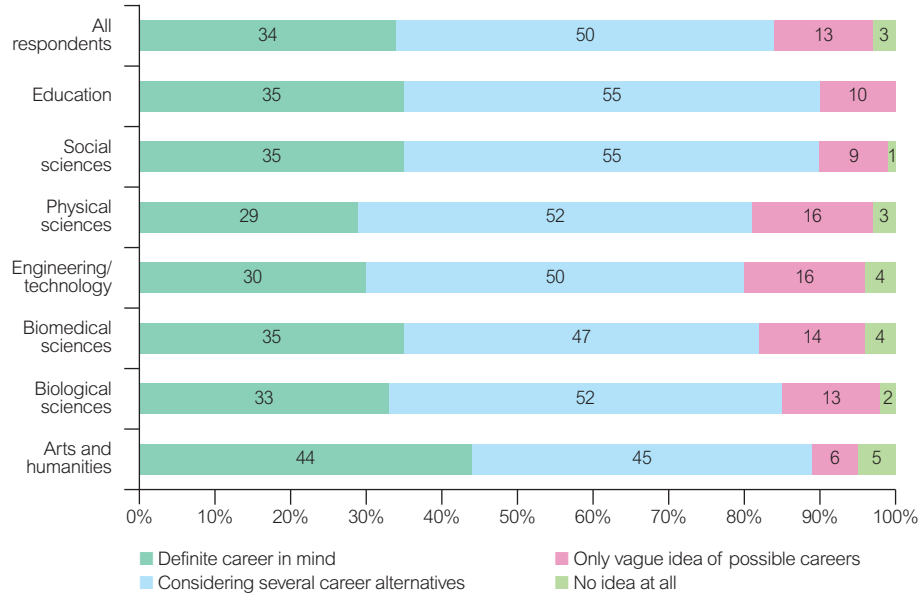

Figure 4.2 Strength of career ideas, by discipline group: final-year respondents

However, overall, over 80% in all disciplines had either a definite idea or several clear alternatives in mind, around 90% for those in education, social sciences and arts and humanities.

In general, researchers in earlier years tended to be slightly less certain about their future career plans, with 21% of researchers prior to final year having only vague ideas (18%) or none at all (3%) of possible careers, compared with 16% of final-year researchers. This trend was consistent across all disciplines with the exception of education, where the position was reversed (which could also be related to their different ages and career trajectories). The evolution of careers ideas with progression through higher education has been considered in a later section.

[10] CRAC (2011) STEM graduates in non-STEM jobs. London: Department for Business, Innovation & Skills www.bis.gov.uk/assets/biscore/further-education-skills/docs/s/11-771-stem-graduates-in-non-stem-jobs.pdf

[11] CROS (2009) Careers in Research Online Survey (CROS) 2009: analysis of aggregated UK results. Vitae www.vitae.ac.uk/cros

4.2 Occupational intentions

Having established that 80-90% of final-year respondents, but slightly fewer in earlier years, had reasonably well-established career ideas, the nature of those ideas, i.e. their career intentions, were investigated. The 2010 Vitae report, 'What do researchers do? Doctoral graduate destinations and impact three years on' introduced a new way to describe and study the labour market outcomes of doctoral graduates by combining occupational groups and employment sectors to create six occupational clusters.[12] These clusters group together similar doctoral graduate occupations to provide a useful typology to explore the extent to which doctoral graduates were working in research in and beyond higher education, in teaching and lecturing roles and other common doctoral occupations outside higher education.

The occupational clusters are:

- Higher education (HE) research roles: those employed as research staff in HE, accounting for 19% of doctoral graduates working in the UK three and a half years after graduating
- Teaching and lecturing in HE (22%)
- Research (not in HE sector) (13%)
- Other teaching roles (6%)
- Other common doctoral occupations: those working in other roles with a high volume of doctoral graduates, for example health professionals, senior managers, engineering professionals, and business, finance and statistical professionals (27%)
- Other occupations (14%)

Those with either a definite career in mind or who were considering several alternatives were asked to list the careers they were considering within the following occupational clusters. A few respondents who expressed an intention to work in higher education but did not make clear whether this was in research or teaching, were classified separately in our analyses, as group C.

A HE research

B Teaching and lecturing in HE

C Unspecified HE

D Research (not in HE sector)

E Other common doctoral occupations

F Other occupations

G Other teaching roles

Table 4.1 shows that, overall, about half of respondents (49%) aspired to a career in higher education, 43% in research outside the higher education sector and 34% in other common doctoral occupations.

More specifically, 46% of those with a definite career in mind wanted a career in higher education, 23% in research outside the higher education sector, 16% in other common doctoral occupations and the remaining 15% in other occupations, of which teaching was the largest. Those considering several alternatives were asked to specify their two most favoured occupations, labelled 'Alternative First', etc. in Table 4.1. Teaching within higher education appeared to be somewhat less popular amongst these respondents, but research outside the higher education sector was more popular.

Respondents were also invited to indicate their career goal by giving an illustrative job title. These job titles enabled additional, more granular analysis of intended career directions. From these data, just over half (57%) of those with definite ideas sought a career of some kind in higher education, somewhat higher than in Table 4.1. This subsidiary analysis was also valuable in gaining an idea of the proportions seeking different roles within higher education:

- 27% higher education teaching only
- 18% higher education teaching and research
- 12% higher education research only

Of those with several alternatives, the proportion seeking a career in higher education was somewhat lower; and of these rather more tended to be seeking a career in higher education research and fewer in higher education teaching alone. Many were considering both careers within higher education and in other sectors.

An overarching observation from these analyses is that around a half of the doctoral researchers were seeking a career within higher education, the majority of whom were seeking either a teaching or combined teaching and research role, whilst only a minority were seeking a pure research role.

This was broadly in line with results from the Postgraduate Research Experience Survey (PRES) 2011[13] in relation to higher education careers, which suggest that overall 57% of doctoral researchers seek a career in higher education (13% in purely research). However it is markedly different for other career directions; for example, far fewer (only 15%) of PRES respondents anticipated working in research outside higher education. It should be noted that the PRES results record a single anticipated career direction (i.e. multiple responses were not incorporated) which does not reflect the ideas of those considering more than one career alternative.

Table 4.1 Occupational intention: respondents with a definite career in mind or considering several alternatives (%)

	Definite career	First alternative	Second alternative	Alternatives combined*	All respondents*
HE research	13	12	7	19	17
Teaching and lecturing in HE	30	16	8	23	26
Unspecified HE	3	4	4	7	6
Research (not in HE sector)	23	34	25	56	43
Other common doctoral occupations	16	20	29	46	34
Other occupations	5	7	15	20	14
Other teaching roles	9	5	10	14	12
Occupation not specified	1	1	2	2	2
Not answered	1	1	0	1	1
(N)	1361	2102	1882	2102	3463

* The figures in this column total more than 100% as respondents considering several alternatives could list more than one occupation.

[12] Vitae (2010) What do researchers do? Doctoral graduate destinations and impact three years on. Vitae www.vitae.ac.uk/wdrd

[13] HEA (2011) Postgraduate Research Experience Survey: 2011 results. Higher Education Academy www.heacademy.ac.uk/assets/documents/postgraduate/PRES_report_2011.pdf

4.2.1 Variation of occupational intentions with discipline

When analysed by respondents' discipline of research, quite significant variations were observed. Amongst those with a definite career in mind (Table 4.2), the proportion seeking a research career in higher education was fairly consistent (11-16%). However the proportion seeking a higher education teaching career varied from 9% in biological sciences to 38% in social sciences, 49% in education and 61% in arts and humanities. Conversely, the proportion seeking non-higher education research roles was much higher in the biological, biomedical and physical sciences than other disciplines. Over 30% of biomedical sciences and engineering/technology sought other common doctoral occupations.

Deeper analysis was conducted of the biomedical sciences and engineering/technology respondents who planned to work in other common doctoral occupations. For the vast majority, those 'other common doctoral occupations' were employment sectors and functions related to their field:

- 85% of those biomedical sciences respondents expected to work in the health sector and 88% in a health and social care job function.
- 70% of those engineering/technology researchers expected to work in the engineering sector and 66% in an engineering job function, while 18% expected to work in a consulting job function.

Relatively similar patterns to these were observed in the responses of those who had several career alternatives in mind. A breakdown of occupational intentions by discipline for all respondents (i.e. both those with a single definite idea and those with several alternatives) is given in Table 4.3. This demonstrates the strong differences by discipline of research.

These patterns were largely in line with limited analysis of career aspirations by broad disciplinary group within PRES 2011, which found higher proportions of researchers in health and STEM disciplines, than those in arts and humanities or social sciences, aspiring to careers outside higher education and also to purely research careers inside or outside higher education.

Table 4.2 Occupational intention, by discipline group: respondents with a definite career in mind (%)

	Arts and humanities	Biological sciences	Biomedical sciences	Engineering/ technology	Physical sciences	Social sciences	Education	All respondents
HE research	14	13	12	11	16	13	12	13
Teaching and lecturing in HE	61	9	15	15	15	38	49	30
Unspecified HE	3	1	2	4	2	6	5	3
Research (not in HE sector)	3	55	34	17	40	6	1	23
Other common doctoral occupations	3	13	31	38	12	13	5	16
Other occupations	6	4	1	4	5	9	1	5
Other teaching	8	5	5	10	9	11	23	9
Not specified	3	0	0	2	1	1	1	1
Not answered	0	0	0	1	0	2	1	1
(N)	305	169	235	132	255	188	77	1361

Table 4.3 Occupational intention, by discipline group: respondents with a definite career or several alternatives combined (%)

	Arts and humanities	Biological sciences	Biomedical sciences	Engineering/ technology	Physical sciences	Social sciences	Education	All respondents
HE research	15	15	19	10	18	20	17	17
Teaching and lecturing in HE	58	10	15	11	12	38	52	26
Unspecified HE	8	3	4	6	2	10	10	6
Research (not in HE sector)	11	76	56	40	60	24	14	43
Other common doctoral occupations	12	25	40	72	37	35	16	34
Other occupations	24	15	9	8	15	15	7	14
Other teaching	13	14	7	11	12	11	26	12
Not specified	3	1	1	2	2	2	3	2
Not answered	1	0	1	1	0	1	1	1
(N)	622	488	560	420	737	482	154	3463

Note: Column percentages total to more than 100% as respondents could specify multiple options.