

# What do researchers do?

## Career paths of doctoral graduates 2011

- Movement within and between occupational clusters over time
  - Common career paths by discipline
  - Typical doctoral graduate occupations

Vitae is supported by Research Councils UK (RCUK),  
managed by CRAC: The Career Development Organisation  
and delivered in partnership with regional Hub host universities

**'What do researchers do? Career paths of doctoral graduates' published by  
The Careers Research and Advisory Centre (CRAC) Limited**

**Produced as part of the 'What do researchers do?' series by Vitae®**

'What do researchers do? Career paths of doctoral graduates'  
has been written by:

- Vivien Hodges, Vitae
- Janet Metcalfe, Vitae
- Emma Pollard, Institute for Employment Studies

With additional contributions and support provided by: Will Hunt and Gill Brown,  
Institute for Employment Studies

The authors would also like to thank Kate Reading, RCUK, for her support with this report and the  
wider cohort study.

Analysis has been undertaken using data from the HESA Longitudinal Destinations of Leavers from  
Higher Education Survey 2008 (© Higher Education Statistics Agency Limited). HESA cannot  
accept responsibility for any inferences or conclusions derived from the data by third parties.

**Vitae is supported by Research Councils UK (RCUK),  
managed by CRAC: The Career Development Organisation  
and delivered in partnership with regional Hub host universities**



**CRAC**

To order a copy please contact Vitae.

Tel: 01223 460277 or email: [orders@vitae.ac.uk](mailto:orders@vitae.ac.uk)

Price where sold: £50.00 ISBN: 978-1-906774-27-1

Material from this document may be reproduced for non-commercial purposes providing 'What do researchers do? Career paths of doctoral graduates, Vitae, 2011' is acknowledged. If material is required for commercial use, please contact Vitae in the first instance.

Vitae®, © 2011 The Careers Research and Advisory Centre (CRAC) Limited

# Contents

<b>Foreword</b>	<b>2</b>
<b>Executive summary</b>	<b>3</b>
<b>1 Introduction</b>	<b>4</b>
1.1 Background	4
1.2 Methodology	5
<b>2 The landscape of doctoral graduate activity</b>	<b>6</b>
2.1 All employment	6
2.2 HE research	7
2.3 Research (not in the HE sector)	9
2.4 Teaching and lecturing in HE	11
2.5 Other teaching occupations	12
2.6 Other common doctoral occupations	14
2.7 Other occupations	16
<b>3 The career pathways of different disciplines</b>	<b>18</b>
3.1 Arts and humanities	18
3.2 Biological sciences	19
3.3 Biomedical sciences	21
3.4 Physical sciences and engineering	22
3.5 Social sciences	24

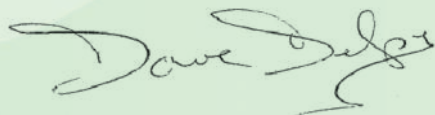
# Foreword

Research Councils UK (RCUK) is committed to attracting and training excellent researchers who can make an impact through world-class research and bring major benefits to the economic and social wellbeing of the UK. As part of the RCUK 'Doctoral Careers Pathway Study', in 2010, the report 'What do researchers do? Doctoral graduate destinations and impact three years on' provided, for the first time, comprehensive evidence of the value of doctoral study to researchers, their employers and society at large.

To further explore how highly-skilled doctoral graduates contribute to UK society, culture and economy, this new report 'What do researchers do? Career paths of doctoral graduates' highlights the employment pathways of researchers within and between six distinct occupational clusters; describing the stability, mobility and progression of researcher careers.

This study illustrates that doctoral research training is a good foundation for a wide variety of occupations and demonstrates the flexibility of researchers who take advantage of a diversity of employment opportunities.

I recommend 'What do researchers do?' as a valuable resource to help inform researchers and all who support them about the extensive range of potential career pathways and roles, particularly in the current challenging economic environment.



**Professor David Delpy**  
Chief Executive, EPSRC  
RCUK Impact Champion



## Executive summary

This report builds on the findings of 'What do researchers do? Doctoral graduate destinations and impact three years on', which was based on the enhanced longitudinal destination data available through the L DLHE and introduced a new typology of six occupational clusters to describe doctoral graduate destinations. This report explores the career pathways of doctoral graduates within and between these clusters three to four years following graduation, their typical occupations and variations by broad discipline groupings.

Overall numbers of doctoral graduate respondents within the occupational clusters presented a fairly static picture from six months after graduation through the three year survey period, with 60% of all respondents following five career pathways.

Total numbers of respondents working in research roles in higher education (HE) declined by a fifth over the survey period. Teaching and lecturing roles in higher education and other common doctoral occupations beyond research both increased by a sixth over the same period. Numbers of respondents employed in the three other occupational clusters, i.e. research occupations outside the HE sector, other teaching and other occupations, remained fairly constant.

However, this apparent stability disguised considerable movement within and between the six occupational clusters over this time period. Over a quarter of all respondents moved between occupational clusters over the survey period, with more than half following a unique pathway.

HE research was the most dynamic cluster, with over two fifths of respondents starting in this cluster moving into other clusters, most commonly into teaching and lecturing in HE. There was also evidence of small numbers of these respondents taking some time out of the labour market after HE research. Additionally, a quarter of respondents in this cluster at the end of the survey period had moved into research roles in HE from other clusters. For those respondents who had stayed in this cluster throughout, there was evidence of progression for some; however, the majority were in the same job throughout the survey period.

For many, respondents' job titles provided evidence of increasing responsibility and career progression within the survey period, not only within a company or cluster

but also between clusters. Between a quarter and two fifths of respondents in each occupational cluster at the survey point had moved there from a different occupational cluster.

For all disciplines, the proportion of doctoral graduates in employment, either in the UK or overseas, increased over the survey period. Each of the five main discipline groups highlighted discipline specific differences in employment patterns.

Arts, humanities and social science respondents were most frequently employed in the teaching and lecturing in HE and other occupations clusters, whereas biological sciences and physical sciences and engineering respondents were more likely to be employed in HE research occupations. Biomedical sciences respondents were most likely to be employed in other common doctoral occupations, predominately the health and social work sector.

Between half and two thirds of respondents in each discipline group followed five key discipline-specific career paths. However there were significant proportions, i.e. up to one in seven respondents, following unique career paths, particularly for arts, humanities, social sciences and biological sciences respondents.

Biological sciences respondents demonstrated the greatest variability of career paths overall, were commonly found in the most dynamic cluster (HE research) and had the lowest proportion of respondents following the top five discipline-specific pathways.

Overall, examining the career paths of doctoral graduates over three and half years following graduation reveals an interesting picture of a high proportion taking common paths, an unexpected degree of mobility between different occupations and employment sectors, usually associated with progression, and a significant proportion creating their own unique paths.

The labour market information section on the Vitae website ([www.vitae.ac.uk/lmi](http://www.vitae.ac.uk/lmi)) illustrates the diversity of these occupations, provides background information on the employment sectors and typical employers, and highlights career stories of doctoral graduates who have taken these paths.

# 1 Introduction

This report builds on 'What do Researchers do? Doctoral graduate destinations and impact three years on'<sup>1</sup> and presents findings from a more detailed exploration of the occupational movement over time of doctoral graduates and from further investigation of career destinations.

## 1.1 Background

The 2010 report, 'What do researchers do? Doctoral graduate destinations and impact three years on' presented the occupational outcomes and perceived impact of doctoral graduates in the few years following doctoral graduation. The research provided new insights into the careers of doctoral graduates, making use of the enhanced longitudinal destinations survey (L DLHE) to capture for the first time the views, experiences and careers of a representative cohort of more than 2,000 doctoral graduates approximately three and a half years after doctoral graduation.

This work was part of a wider investigation led by the Research Councils UK and supported by Vitae to explore and track the career pathways of doctoral graduates and to inform policy development directed at supporting and training future doctoral graduates.

The report captured the reflections of doctoral graduates on their experiences of research study, their perceptions of the impact of their research training and skills in the workplace and on their own careers, data on their labour market outcomes and their views of the impact doctoral graduates have on the economy and wider aspects of society and culture in the UK.

The report also 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<sup>2</sup>. These clusters group together similar doctoral graduate

occupations and provide a useful typology to explore the extent to which doctoral graduates are 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:

- HE research roles: those employed as research staff in higher education (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%)

These five clusters are particularly appropriate to describe doctoral graduate destinations, accounting for 86% of employed doctoral graduate respondents. Only 37% of first degree graduates and 44% of masters graduates are concentrated in these occupational clusters.

The final cluster captures the remaining spread of occupations across all sectors, for example science and engineering technicians, artistic and literary occupations, and public service professionals; accounting for 14% of doctoral graduates.

### Moving forward

This report makes use of detailed information captured during the longitudinal destinations survey (L DLHE) to explore in more detail doctoral graduates' labour market outcomes three and a half years after graduating and to track their activities and movements up to this point. For the first time this provides us insight into how doctoral graduates' careers develop over time.

In Chapter 2 we describe the landscape of the occupational clusters in more detail, including examples of doctoral graduate jobs. The longitudinal activity history data has been mined to identify the range of career pathways within and between the occupational clusters and to understand how doctoral graduates' careers have developed over time.

The subset of doctoral graduates who were employed as research staff in higher education are of particular interest and we follow what has happened to this group, including those who have stayed in these roles and others who have moved on into other occupations.

In Chapter 3 the career paths and labour market outcomes are described for doctoral graduates from broad subject groupings.

<sup>1</sup> What do researchers do? Doctoral graduate destinations and impact three years on (Vitae, 2010) [www.vitae.ac.uk/wdrd](http://www.vitae.ac.uk/wdrd)

<sup>2</sup> What do researchers do? Doctoral graduate destinations and impact three years on. Methodology (Vitae 2010). [www.vitae.ac.uk/wdrdmethodology](http://www.vitae.ac.uk/wdrdmethodology)

## 1.2 Methodology

### Source data

This report primarily explores the labour market information of doctoral graduates over time. The 2008 L DLHE dataset was recorded for occupation and sector data, for current employment and employment history. This dataset is held by RCUK. For data protection all base numbers have been rounded to the nearest five as per HESA<sup>3</sup> guidelines. Numbers and percentages may therefore not total due to rounding. Unweighted data has been used, as this is the accepted methodology for career pathway analysis. Throughout the report occupational cluster data includes all doctoral graduate respondents regardless of work location, i.e. including those working overseas. Therefore the data may vary from that presented in 'What do researchers do? Doctoral graduate destinations and impact three years on', 2010.

Respondents to the L DLHE survey undertaken in 2008 were asked to record chronologically all their main activities, i.e. 'different jobs, or periods where you were engaged in study, were looking for work, or were taking time out'. This included promotions or different jobs for the same employer.

Respondents could record up to nine activities from immediately after graduation to their activity at the time of the survey. For each activity a range of data was collected: the type of activity, i.e. paid employment, unpaid work, studying/training, or unemployment; the start and end date; details about the employer or education provider; details about the job role or course studied; type of contract; and approximate annual gross salary.

### Determining career pathways

To explore career pathways the number and type of different activities of doctoral graduates was examined. Using the activity history data it was possible to provide snapshots of activity at six monthly intervals from graduation to the time of the survey, approximately three and a half years on, and in this way track how careers progress. For individual respondents, a sequential picture was built up of activities and the movement between them. This provided a clear picture of the heterogeneity of doctoral graduate career paths, but also enabled common career paths to be identified. However, it is worth noting that in some cases this career history may only show part of the picture, as only the main activity was captured at each time point, and where start and end dates of activities overlap only one activity was shown. An additional potential source of error was the ability of individuals to recall events and experiences with accuracy.

The occupational clusters developed in 'What do researchers do? Doctoral graduate destinations and impact three years on' were used to record how doctoral graduates' careers develop over time:

1. HE research
2. Research (not in HE sector)
3. Teaching and lecturing in HE
4. Other teaching roles
5. Other common doctoral occupations
6. Other occupations

To ensure respondents have a complete career path, other activities were also recorded, i.e. further study (7), other activity (neither in work nor further study, e.g. unemployment or taking time out) (8), and activity unknown (9).

Seven digit codes were created to represent each respondent's career path, where each digit represents employment in the occupational cluster, or other activity, at six monthly points from 6 to 42 months post-graduation. Across the 2075 doctoral graduates responding to the survey, 379 different career paths were identified, many of these (63%) were followed by only one individual. For ease of reporting, pathways were truncated to show only movement from one cluster to another. 196 truncated pathways were identified with more than half of these pathways (52%) unique to an individual.

<sup>3</sup> Higher Education Statistics Agency (HESA) [www.hesa.ac.uk](http://www.hesa.ac.uk)

## 2 The landscape of doctoral graduate activity

'What do researchers do? Doctoral graduate destinations and impact three years on' introduced occupational clusters as a way to categorise labour market outcomes for doctoral graduates. In this chapter the six occupational clusters are explored in more detail, including examples of types of occupations of doctoral graduates. The mobility of respondents within and between the clusters is described in more detail and common career pathways identified.

### 2.1 All employment

#### Key statistics

- The apparent stability of the occupational clusters over three years disguises considerable movement between clusters
- 60% of respondents followed five career paths; 71% followed ten pathways
- 71% of respondents stayed in the same occupational cluster throughout the three years; 45% in the same position
- 27% of respondents moved out of their initial cluster into another cluster; of these a third (34%) had moved out of the HE research cluster, representing 40% of all starters in this cluster
- 379 different career paths were identified, 63% were followed by only one individual. 196 truncated pathways (only showing movement from one cluster to another) were identified, 52% of these were unique

#### Overview

The relative size of the six occupational clusters changed over time as doctoral graduate respondents progressed in their careers moving within and between clusters, and to some extent in and out of the labour market, over time<sup>4</sup> (Figure 2.1).

Six months after graduation the largest occupational clusters for doctoral graduates

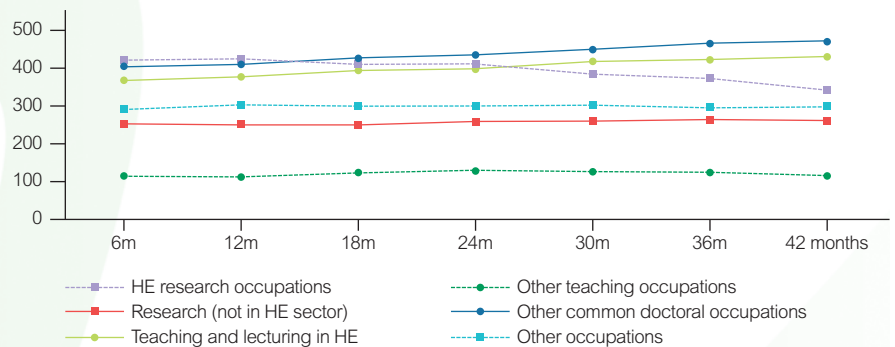


Figure 2.1 Occupational clusters over time for all employed respondents (at 3.5 years, N=1920)

were HE research (23%), HE teaching and lecturing (20%), and other common doctoral occupations (22%). The size of the HE research cluster diminished over time, with a particularly noticeable decline two years after doctoral graduation. Numbers in the other common doctoral occupations and HE teaching and lecturing clusters gradually increased over time. Total numbers in the other clusters remained relatively stable over the survey period.

However, this picture of the net change in cluster size disguises considerable movement between and within clusters (Table 2.1). Only 71% of respondents stayed

in the same cluster throughout the survey period, 45% in the same job. Overall, 27% of respondents left their original occupational cluster and 29% of respondents joined a new cluster over the three year survey period. All of the occupational clusters had a small number of respondents (fewer than 4%) who left and returned to the same cluster.

HE research was the most dynamic cluster with 40% of the respondents who started in this cluster leaving, and a quarter of those in this cluster at the final survey point (26%) joining over the three year period. Other occupations was the next most active cluster

Table 2.1 Summary of movements in and out of occupational clusters over time

Cluster	At 6 months	Stayed in cluster throughout	Left cluster	Returned to cluster	New entrants to cluster	At 3.5 years
HE research	420	240	170	15	90	340
Research (not in HE)	255	170	80	5	85	260
Teaching and lecturing in HE	370	315	45	10	105	430
Other teaching occupations	115	75	40	<5	40	115
Other common doctoral occupations	405	340	55	10	120	470
Other occupations	295	175	110	10	115	300
Total in employment (within and outside the UK)	1855	1315			555	1920

<sup>4</sup> Unweighted data has been used, as this is the accepted methodology for career pathway analysis. Throughout the report occupational cluster data includes all doctoral graduate respondents regardless of work location, i.e. including those working overseas. Therefore the data may vary from that presented in What do researchers do? Doctoral graduate destinations and impact three years on, 2010 www.vitae.ac.uk/wdrd For data protection, all base numbers have been rounded to the nearest five. Numbers and percentages may therefore not total due to rounding.

with 37% of starting respondents leaving the cluster, while 38% of the final numbers in this cluster had joined during the three year period.

Teaching and lecturing in HE was one of the most stable occupational clusters with 85% of respondents staying in this cluster throughout the three year period; 24% of the final numbers in this cluster had joined during the three year period. A similar proportion (84%) of respondents who started in the other common doctoral occupations cluster stayed throughout the three year period; more than a quarter of the final numbers in this cluster, however, had joined during the three year period (26%). The movements between and within clusters is discussed in more detail in the following sections.

Exploring the activities of respondents throughout the survey period to identify movement of respondents between clusters and in and out of employment revealed 379 different career paths, with 71% of

Table 2.2 Common career paths for all respondents<sup>5</sup>

Rank	Career pathway	Respondents	%
1	Other common doctoral occupations throughout	340	16
2	Teaching and lecturing in HE throughout	315	15
3	HE research throughout	240	12
4	Other occupations throughout	175	9
5	Research (not in HE sector) throughout	170	8
6	Other teaching occupations throughout	75	4
7	Taking time out of the labour market	45	2
8	HE research then teaching and lecturing in HE	45	2
9	HE research then Research (not in HE sector)	30	2
10	Other occupations then other common doctoral occupations	30	1
Total (in 10 most common pathways)		1460	71
Total (all doctoral graduate respondents)		2075	100

respondents following ten common career pathways (Table 2.2). 64% of respondents followed six career paths which all involved staying the same occupational cluster

throughout the three years. However, as will be seen in the following sections, there is evidence of movement between and progress within the clusters.

## 2.2 HE research

### Key statistics

- A quarter of respondents (23%) were initially employed in this occupational cluster, reducing to 18% at the end of the survey period
- 86% of respondents starting in this occupational cluster followed five career pathways
- 57% of respondents stayed in HE research throughout the three years; nearly two thirds of this group (62%) in the same position
- 43% of respondents who started in HE research left these occupations, a quarter of these (11% overall) went into HE teaching and lecturing positions
- A quarter of respondents (26%) working in HE research at the end of the survey moved in from other clusters, mostly from other occupations (21%) or non-HE research jobs (19%)

### Overview

The HE research occupational cluster consists of doctoral graduates primarily employed to undertake research in higher education institutions. For many researchers these jobs are seen as a step towards an academic career in teaching and lecturing.

HE research was both the largest and the most dynamic occupational cluster: Six

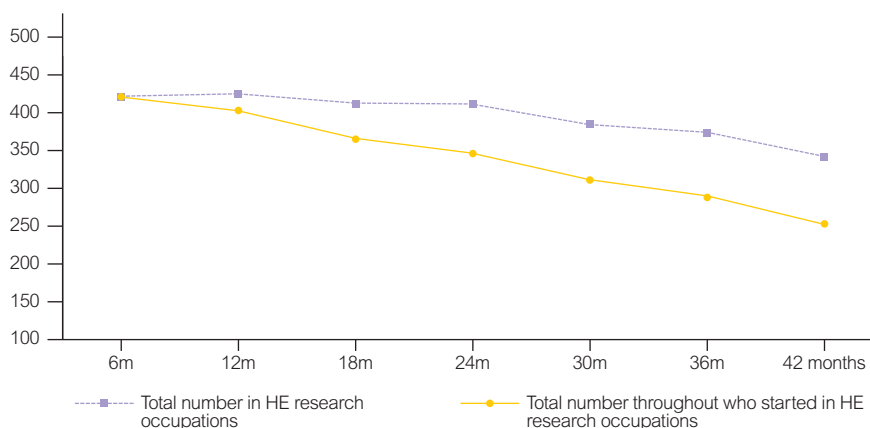


Figure 2.2 Respondents in HE research occupations over time

months after completion of a doctorate, almost a quarter (23%) of employed respondents were working in higher education in a predominantly research role. This cluster was particularly common for respondents from the biological sciences and from physical sciences and engineering disciplines.

Three years later the number in this cluster had fallen substantially, with less than a fifth (18%) of doctoral graduates working in these occupations (see Figure 2.2). Overall this occupational cluster decreased by 19% over the three year period.

### Movement over time

Looking at the 420 respondents who started in HE research jobs, 255 (60%) were still in this cluster three years later (see Figure 2.3). 57% (240) had stayed in the cluster throughout the total survey period, while less than 5% moved out but then returned to the cluster.

Of the large proportion of respondents who stayed within this cluster, nearly two-thirds (62%) were in the same job throughout the survey period, while over one third (38%) had changed jobs at least once. For some

<sup>5</sup> Truncated career pathways. Throughout the report, career paths refer to distinct pathways taken by respondents over time. Seven digit codes were created to represent each respondent's career path, where each digit represented employment in an occupational cluster, or other activity, at six monthly points from 6 to 42 months post-graduation. For ease of reporting, pathways were truncated to show only movements from one cluster to another, irrespective of the time period.

this appeared to be a progression to more senior jobs (see Figure 2.4), however for others, the descriptions of their jobs indicated that they moved from one short-term contract to another with little change in their responsibilities.

Employer names were not retained in the dataset so it was not possible to do any exploration of where these doctoral graduates were employed, or movement between institutions within the time period of the survey. This will be an interesting aspect to consider for future work with the longitudinal destinations data.

### Moving on from research in higher education

40% of those taking up HE research jobs after graduation had moved out of HE research into another cluster, three to four years after graduation. Most often they moved out directly into teaching and lecturing jobs in higher education (11%) as lecturers, senior lecturers, tutors or postdoctoral teaching fellows (Table 2.3).

There were indications that doctoral graduate respondents who moved into teaching and lecturing jobs in higher education did so because they wanted to improve their career options and/or their fixed term contracts had come to an end (although the numbers are small). These moves fitted with respondents' motivations to study for a research degree, their reported career plans, and/or were exactly the type of work they wanted. In general the group moving on from research jobs into teaching and lecturing in higher education were more satisfied with their careers than those remaining in HE research jobs.

94% of doctoral graduate respondents starting in HE research followed ten key pathways, with 86% following just five pathways. For almost 5% of these respondents their pathway included a period out of the labour market following their research job in higher education.

### Moving into HE research

Although almost half of all doctoral graduate respondents who start in HE research left over the three years; 340 respondents were working as HE researchers after three to four years. A quarter of these (26%) had moved into this cluster from another cluster or activity. 70% had moved into HE research from five specific pathways, most commonly from jobs in the other occupations cluster (21% of these entrants) or from research jobs outside of HE (19%).

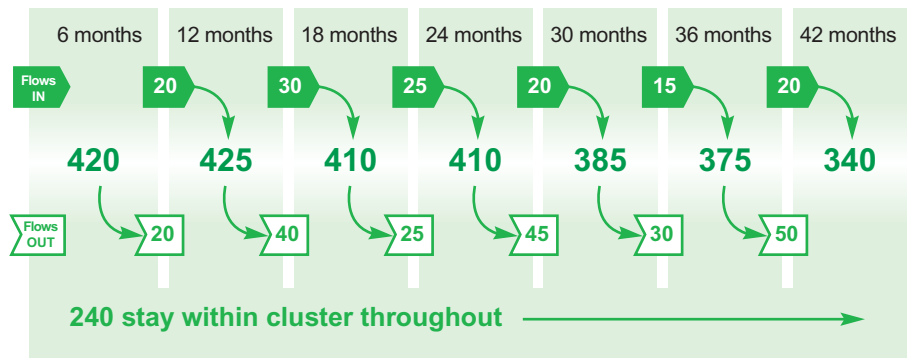


Figure 2.3 HE research occupations: movements in and out of cluster

Table 2.3 Common career paths followed by respondents starting in HE research (N=420)

Rank	Career pathway after HE research	Respondents	%
1	HE research throughout	240	57
2	Teaching and lecturing in HE	45	11
3	Research (not in HE sector)	30	8
4	Other common doctoral occupations	20	5
4	Other occupations	20	5
6	Further study	10	2
6	Taking time out of the labour market	10	2
8	Taking time out of the labour market before returning to HE research	10	2
9	Other teaching jobs	5	1
10	Taking time out of the labour market before moving to other common doctoral occupations	5	1
10	Taking time out of the labour market before moving on to further study	5	1
<b>Total (in most common pathways)</b>		<b>395</b>	<b>94</b>
<b>Total (starting in HE research jobs)</b>		<b>420</b>	<b>100</b>

**Examples of HE research jobs**

- Career Development Fellow in medical research
- Postdoctoral Research Associate
- Research Associate with an EPSRC grant
- Knowledge Transfer Partnership Associate
- Clinical Pharmacology Research Associate monitoring clinical trials
- Research Assistant in the Department of Sociology
- Research Fellow

**Examples of other research jobs following HE research**

- Senior Research Scientist for a government laboratory
- Research Assistant for a pharmaceutical company
- Water Quality Scientist for a utilities company
- Archaeologist for a heritage consultancy

**Examples of other common doctoral jobs following HE research**

- R&D manager for a chemicals manufacturer
- Senior Specialist Software Engineer
- Quantitative Analyst for an investment bank
- Trainee Clinical Psychologist for the NHS
- Risk and Data Management Team Leader for an oil and gas consultancy
- Strategic Research Officer
- Science and Technology Policy Specialist for government

**Examples of other occupations following HE research**

- Medical Writer for a medical communications company
- Associate Editor for a scientific publishing company
- Trainee Patent Attorney
- Student Environmental Health Officer for a local authority

**Examples of progression within HE research**

- Junior Research Fellow, Postdoctoral Researcher to Career Development Fellow
- Research Technician to Scientific Officer
- Researcher to Research Fellow/Lecturer
- Analyst to Research Fellow
- Research Associate, Research Fellow to Senior Research Fellow

Figure 2.4 Examples of jobs for respondents moving within and beyond the HE research cluster

## 2.3 Research (not in HE sector)

### Key statistics

- Overall numbers of respondents in this cluster were roughly consistent over time (14%)
- 95% of respondents starting in this occupational cluster followed ten career pathways
- 66% of respondents stayed in research jobs outside HE throughout the three years; almost half changed jobs, many increasing their responsibilities
- 34% of respondents who started in research (not in HE sector) left this cluster, half of these into common doctoral occupations and HE research
- 33% of respondents working in research jobs outside higher education at the end of the survey moved in from other clusters, more than a third from HE research jobs

### Overview

This cluster includes doctoral graduate respondents working in research jobs outside HE, predominantly working in the private sector.

It was one of the smaller clusters for doctoral graduate respondents six months after graduation. At this point 255 (14%) employed doctoral graduates were working in research jobs outside the HE sector. This cluster was particularly common among doctoral graduates from biological sciences and increasingly so (over time) for physical sciences and engineering graduates. Over the survey period the numbers of respondents within this cluster remained fairly static at around 14% of the total (Figure 2.5). Overall, this cluster grew by only 3% over the period. However, this apparently static picture hides movement in and out of the cluster, and within the cluster, over time.

At the time of the survey, two thirds of respondents (67%) in this cluster were working in the scientific research and development sector (43%) and manufacturing sectors (23%), particularly chemical manufacturing (18%). Health and social work (13%), business (9%) and public administration (6%) were also relatively common sectors for research activity (Figure 2.6).

Generally those working in research jobs outside HE were working as scientific researchers, most commonly biochemists and medical scientists (11%), and research and development chemists (9%) (Figure 2.7). This spread of occupations reflects the high proportion of doctoral graduates from biological sciences disciplines in these non-HE research jobs.

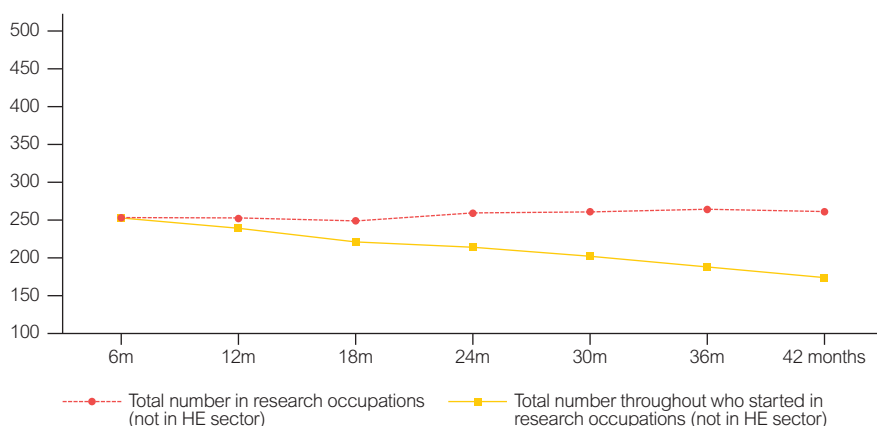


Figure 2.5 Respondents in research occupations (not in HE sector) over time

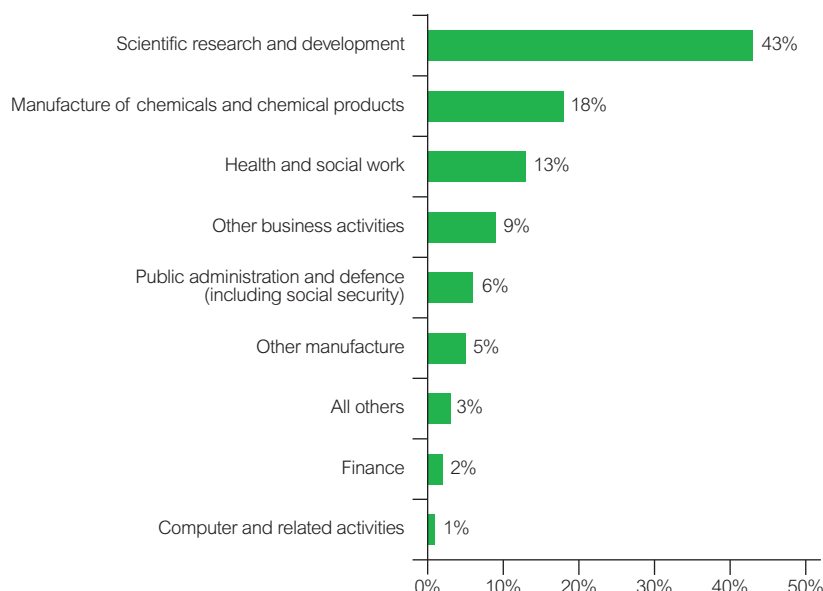


Figure 2.6 Key employment sectors for respondents working in research (not in HE sector) at the time of the survey (at 3.5 years, N=260)

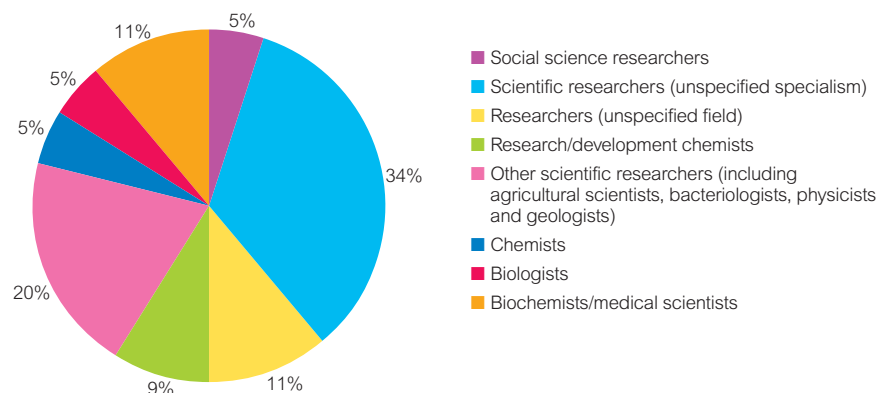


Figure 2.7 Occupation of doctoral graduates in research (not in HE sector) at 3.5 years, N=260

### Movement over time

170 (66%) stayed in research jobs outside of higher education throughout the period (Figure 2.8). A third had moved into another cluster over the survey period, and a very small number (fewer than ten) had left the cluster, but then returned.

Even amongst the large proportion who had stayed in the non-HE research occupational cluster throughout the survey period there was movement over time. Almost half (45%) reported having more than one job since graduating. Examining the descriptions of their jobs and responsibilities suggested that, for many, these movements involved some form of progression. For examples of job titles of respondents moving within research (not in HE) see Figure 2.9.

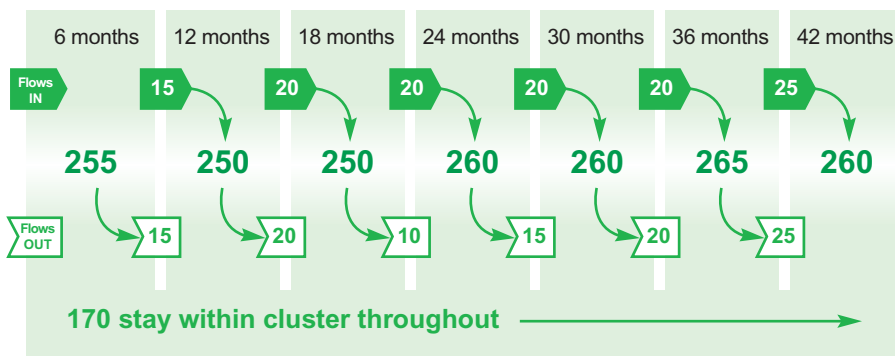


Figure 2.8 Research (not in HE sector): movements in and out of cluster

### Moving on from research jobs outside HE

95% of doctoral graduate respondents starting in research jobs outside higher education followed ten key pathways (Table 2.4). Generally, the third of respondents (34%) moving out of non-HE research jobs tended to go into other common doctoral occupations (8% of all starters), to HE research jobs (7%) or to other occupations (5%). Examples of job titles of those moving out of this cluster are illustrated in Figure 2.9.

### Moving into research jobs outside HE

Although the total numbers in non-HE research jobs remained relatively stable over time, a substantial group of respondents who started in research occupations outside the HE sector after graduation left this cluster. Of the 260 doctoral graduate respondents in this cluster at the end of the survey period, a third had moved into this cluster from another job or activity. Most commonly, those entering non-HE research after some time did so from HE research jobs (37% of these entrants), or from other occupations (13%).

<p><b>Examples of research jobs outside the HE sector</b></p> <ul style="list-style-type: none"> <li>■ Dairy Research Scientist for an agricultural research organisation</li> <li>■ Marine Geologist for an Antarctic research organisation</li> <li>■ Senior Research and Futures Advisor for government</li> <li>■ Trading Strategy Researcher for an asset management company</li> <li>■ Senior Synthetic Chemist for a pharmaceutical company</li> <li>■ Team Leader for a medical diagnostics company</li> <li>■ Senior R&amp;D Scientist for a biotechnology/pharmaceuticals company</li> <li>■ Ecologist and Project Leader for an international conservation organisation</li> <li>■ R&amp;D Scientist for a contract research company</li> <li>■ Researcher for a company evaluating government programmes</li> <li>■ Physical Properties Chemist for a pharmaceuticals company</li> </ul>	<p><b>Examples of other occupation jobs following other research</b></p> <ul style="list-style-type: none"> <li>■ Technical Sales Manager for a medical products company</li> <li>■ Quantity Surveyor for chartered surveyors</li> <li>■ Environmental Policy Advisor</li> </ul> <p><b>Examples of other common doctoral jobs following other research</b></p> <ul style="list-style-type: none"> <li>■ Trainee Actuary for a financial company</li> <li>■ Senior Consultant evaluating European programmes</li> </ul> <p><b>Examples of HE research jobs following other research</b></p> <ul style="list-style-type: none"> <li>■ Postdoctoral Research Scientist</li> </ul> <p><b>Examples of progression within other research</b></p> <ul style="list-style-type: none"> <li>■ Researcher to Technical Manager</li> <li>■ Researcher to Senior Researcher</li> <li>■ Technical Officer to Technical Specialist</li> <li>■ Development Chemist to Senior Scientist</li> <li>■ Postdoctoral Researcher to Senior Scientist</li> <li>■ Research Associate to Investigator to Senior Scientist</li> <li>■ Research Assistant to Research Scientist</li> <li>■ Trainee Clinical Scientist to Clinical Scientist</li> </ul>
--	--

Figure 2.9 Examples of jobs for respondents moving within and out of research (not in HE sector)

Table 2.4 Common career paths followed by respondents starting in research (not HE)

Rank	Career pathway after research (not HE) jobs	Respondents	%
1	Research (not in HE sector) throughout	170	66
2	Other common doctoral occupations	20	8
3	HE research	15	7
4	Other occupations	15	5
5	Taking time out of the labour market	5	2
6	Teaching and lecturing in HE	5	2
7	HE research before moving to other occupations	5	1
7	Other occupations before moving to other common doctoral occupations	5	1
9	Further study	<5	1
9	Other occupations before returning to research (not HE sector)	<5	1
	<b>Total (in most common pathways)</b>	<b>240</b>	<b>95</b>
	<b>Total (starting in Research (not HE sector) jobs)</b>	<b>255</b>	<b>100</b>

## 2.4 Teaching and lecturing in HE

### Key statistics

- Numbers of respondents employed in the teaching and lecturing in HE cluster increased by 17% over three years
- 97% of respondents starting in this occupational cluster followed ten career pathways
- 86% of respondents stayed in HE teaching and lecturing jobs throughout the three years; less than one third (31%) changed jobs within the cluster
- 14% of respondents starting in teaching and lecturing in HE left, commonly to HE research jobs or out of the labour market<sup>6</sup>
- One quarter of respondents (24%) working in HE teaching and lecturing moved in from other clusters; 42% of these from HE research occupations

### Overview

This cluster includes individuals working as teaching and lecturing professionals in higher education. Their jobs primarily involve teaching, but they may also spend significant time on research activities.

There was evidence of progression to and within academic careers for respondents within four years of gaining their doctorate. One in five respondents were in teaching and lecturing in higher education six months after graduation. Three years later this had increased by 17% to 22% of all respondents (Figure 2.10). This cluster was particularly common among arts and humanities and social sciences respondents.

The majority of respondents (70%) in this cluster were working as lecturers (Figure 2.11).

Of the 11% working in professorial jobs, more than a quarter were working as full professors; most had been in their mid to late 30s when they had started their doctoral studies and likely to have had an established academic career path beforehand. Others were working as assistant, associate and adjunct professors, generally working overseas.

Only a minority (14%) of those in teaching and lecturing jobs in higher education had gained a postgraduate diploma or certificate such as a PGCE since graduating in 2005.

### Movement over time

86% of respondents in this cluster worked in teaching and lecturing jobs throughout the survey period (Figure 2.12). Two thirds of these respondents had only one position throughout the period, while 31% had moved jobs. Examining their job descriptions suggested that for many of these respondents, movements involved some form of progression (Figure 2.13).

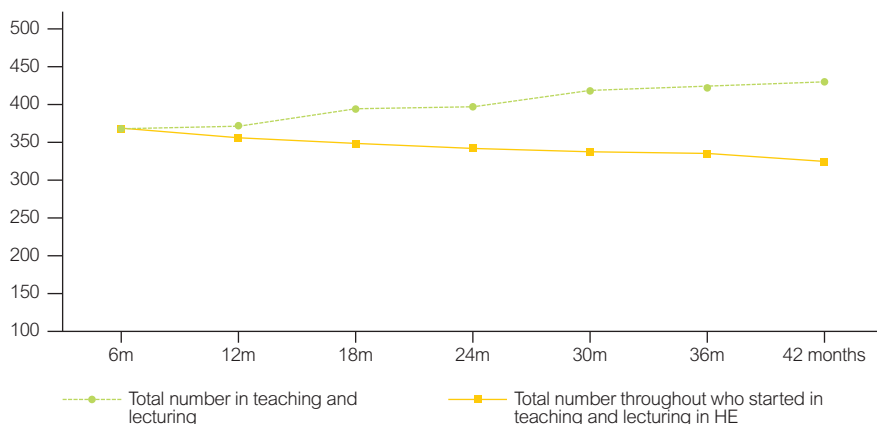


Figure 2.10 Respondents in teaching and lecturing over time

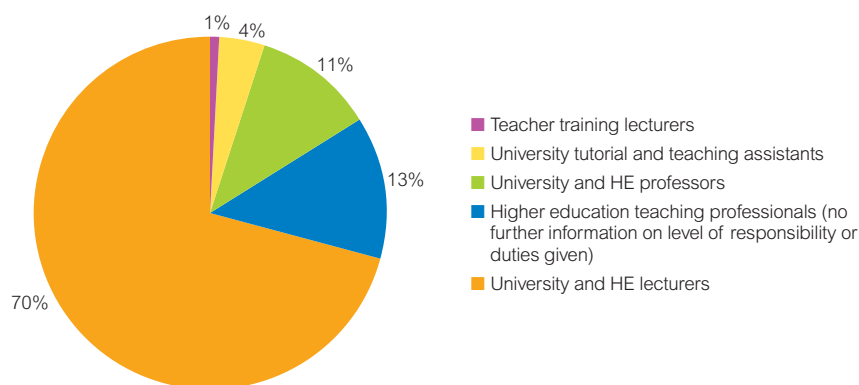


Figure 2.11 Occupation of respondents in HE teaching and lecturing (at 3.5 years, N=430)

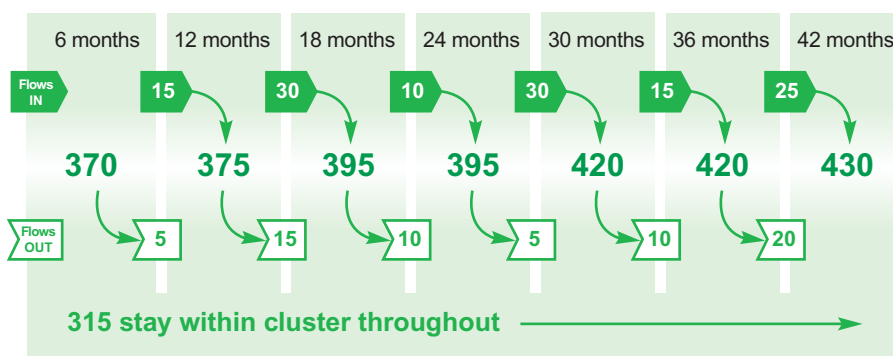


Figure 2.12 Teaching and lecturing in HE: movements in and out of cluster

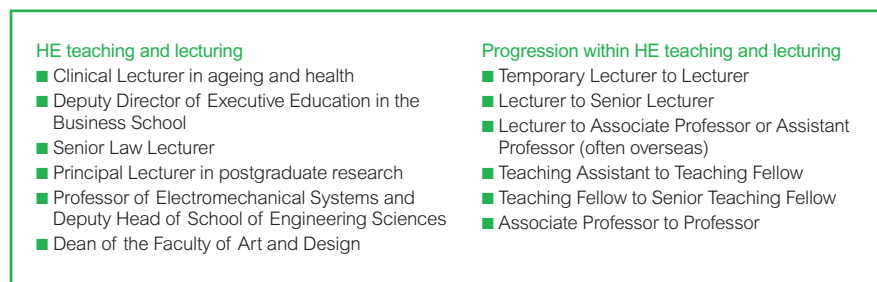


Figure 2.13 Examples of jobs within the teaching and lecturing in HE cluster

<sup>6</sup> Indicative findings only due to the small base size

## Moving on from teaching and lecturing in HE

97% of respondents starting in HE teaching and lecturing jobs followed ten career pathways (Table 2.5). 14% of respondents starting in HE teaching and lecturing jobs moved out into another occupational cluster, either leaving the labour market altogether (2%), or moving within the HE sector into HE research occupations (2%).

## Moving into teaching and lecturing in HE

Three and a half years after graduating, there were 430 doctoral graduates in this cluster. One quarter had moved into this cluster from another job or activity, mainly from HE research (42%), from other occupations (15%) or other teaching occupations (11%).

Table 2.5 Common career paths followed by respondents starting in teaching and lecturing in HE occupations (at 3.5 years, N=370)

Rank	Career pathway after HE teaching and lecturing jobs	Respondents	%
1	Teaching and lecturing in HE throughout	315	86
2	HE research	10	2
2	Time out of the labour market	10	2
4	Other occupations	5	2
5	Research (not in HE sector)	5	1
6	Other teaching jobs	5	1
6	HE research before returning to teaching and lecturing in HE	5	1
8	Other common occupations	5	1
9	Other teaching jobs before returning to teaching and lecturing in HE	<5	<1
9	Time out before returning to teaching and lecturing in HE	<5	<1
	<b>Total (in most common pathways)</b>	<b>360</b>	<b>97</b>
	<b>Total (starting in HE teaching and lecturing jobs)</b>	<b>370</b>	<b>100</b>

## 2.5 Other teaching occupations

### Key statistics

- Overall numbers in this cluster were consistent over time at 6% of the total; 74% of respondents worked in secondary or further education occupations
- 93% of respondents starting in this cluster followed seven career pathways
- 64% of respondents stayed in the other teaching occupations cluster throughout; more than 90% in the same job throughout the three years
- More than one third of respondents left the cluster (35%), primarily moving into teaching and lecturing in HE (10%)
- 35% of respondents working in other teaching occupations at the end of the survey moved in from other clusters, mainly after spending time in further study.

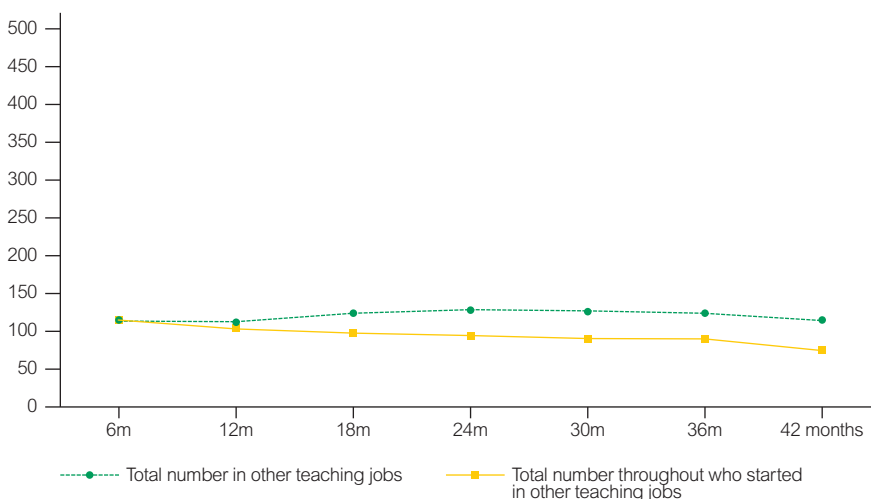


Figure 2.14 Respondents in other teaching jobs over time

### Overview

This cluster included those working in teaching or educational occupations outside the HE sector. The total number of respondents in other teaching occupations remained constant over the survey period at 6% of the total (Figure 2.14).

Almost one quarter (22%) of respondents in other teaching occupations had obtained a PGCE or other postgraduate certificate/diploma since graduation, compared to only 14% of respondents

employed in teaching and lecturing in the higher education sector (Figure 2.15).

At the time of the survey, almost half of respondents (45%) in this cluster were working in secondary education and 29% in further or higher education (Figure 2.16). One in seven were working in senior management jobs as head teachers or senior administrators, most likely previous occupations before their doctoral studies (Figure 2.17).

#### Other teaching occupations

- Chemistry Teacher at a high school
- Senior Lecturer in Social Work in a further education college
- Head Teacher of a community comprehensive secondary school
- Deputy Head Teacher of a secondary school
- Lecturer in Construction at an FE college
- Teacher of A level Psychology
- Teacher of English at a secondary school
- Educational Adviser for a communications company

Figure 2.15 Examples of jobs for respondents within the other teaching occupations cluster

## Movement over time

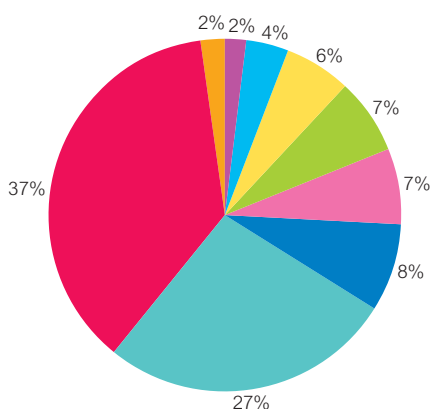
Two thirds (64%) had stayed in teaching occupations throughout the three years, with less than 10% of these changing jobs during this time. However, the consistent number of respondents in other teaching occupations throughout the survey period disguises a degree of movement in and out of this cluster (Figure 2.18).

## Moving on from other teaching occupations

93% of the total number of respondents starting in other teaching occupations followed seven common career pathways (Table 2.6). Approximately one third (35%) had moved out of other teaching occupations into another cluster, most commonly to HE teaching and lecturing (10%). Examples of jobs in this cluster and of those moving into teaching and lecturing in higher education are illustrated in Figure 2.19.

## Moving into other teaching occupations

The numbers in other teaching occupations hardly changed over time yet there were individuals leaving these jobs. Most commonly, those entering other teaching occupations did so after spending time in further study or moved into teaching jobs from the other occupations cluster.



- Other teachers (including music, dance and drama teaching, language tutors)
- Education officials (including advisors, inspectors, examiners, moderators)
- Primary teachers
- Registrars and senior administrators of educational establishments
- Teaching professionals (no further information given)
- Head teachers (secondary and primary)
- FE and adult education teaching professionals
- Secondary education teachers
- Other

Figure 2.17 Occupation of respondents in other teaching roles (at 3.5 years, N=115)

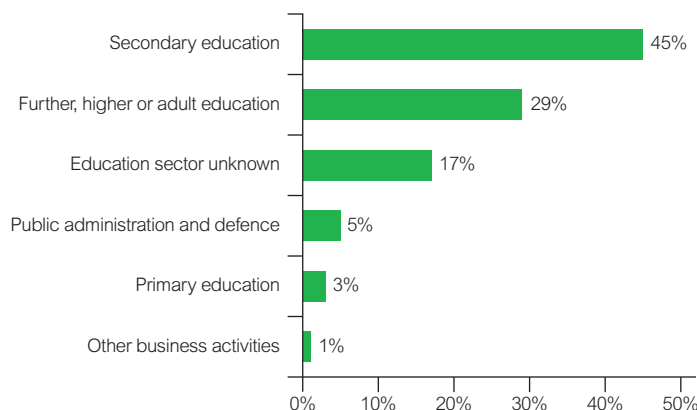


Figure 2.16 Key employment sectors of respondents in teaching roles outside HE (at 3.5 years, N=115)

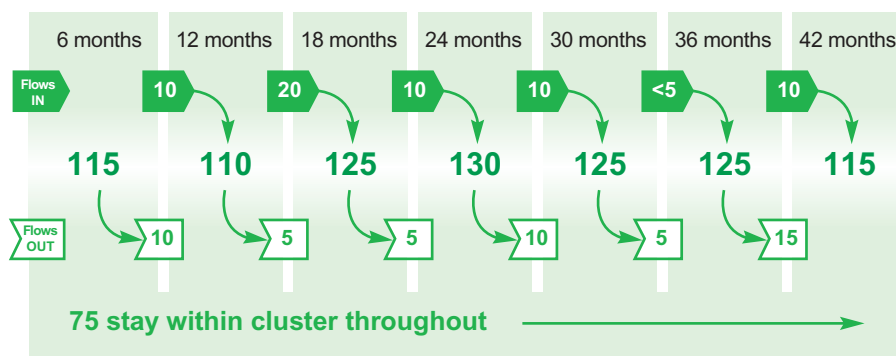


Figure 2.18 Other teaching occupations: movements in and out of cluster

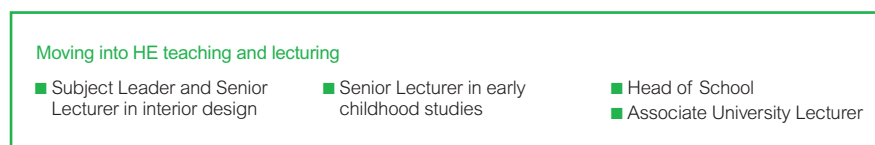


Figure 2.19 Examples of jobs for respondents within the other teaching occupations cluster moving into teaching and lecturing jobs in HE

Table 2.6 Common career paths followed by respondents starting in other teaching occupations (N=115)

Rank	Career pathway after other teaching occupations	Respondents	%
1	Other teaching occupations throughout	75	64
2	HE teaching and lecturing	10	10
3	Other occupations	5	5
3	Time out of the labour market	5	5
5	HE research	5	4
6	Other common doctoral occupations	5	3
7	Further learning	<5	2
Total (in most common pathways)		105	93
Total (starting in other teaching occupations)		115	100

## 2.6 Other common doctoral occupations

### Key statistics

- More than one in five respondents (22%) were initially employed in the other common doctoral occupations cluster, increasing to one in four (25%) at the end of the survey period
- 94% of respondents starting in this cluster followed ten career pathways
- 84% of respondents stayed in this cluster throughout, almost half (43%) had changed jobs within the survey period
- 16% of respondents left the cluster primarily moving into other occupations (3%)
- 25% of respondents working in this cluster at the end of the survey moved in from other clusters; 23% from other occupations, 19% from HE research occupations and 17% from research (not HE) jobs

### Overview

The other common doctoral occupations cluster includes occupations with a high volume of doctoral graduates, of any age, and any career length, and was derived using analysis of the UK Labour Force Survey (LFS)<sup>7</sup>.

Over the survey period, the proportion of respondents in this cluster increased from 22% to 25%, an increase of 16% (Figure 2.20). This cluster was particularly common among biomedical sciences and physical sciences and engineering doctoral graduates.

At the time of the survey, respondents from the other common doctoral occupations were spread across a wide range of employment sectors, including health and social work (27%), manufacturing, particularly manufacture of chemicals and chemical products (17%) and other business activities<sup>8</sup> (15%) (Figure 2.21).

Half of the respondents were employed as health professionals (28%, including junior doctors; specialist registrars; consultants and general practitioners; educational psychologists and clinical psychologists) and function managers (22%, including R&D managers; product sales managers and marketing managers) (Figure 2.22). Examples of job titles are illustrated in Figure 2.23.

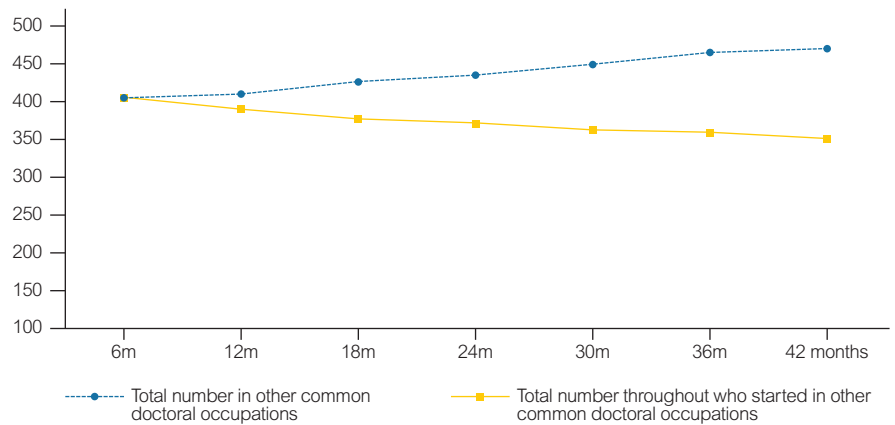


Figure 2.20 Respondents in other common doctoral occupations over time

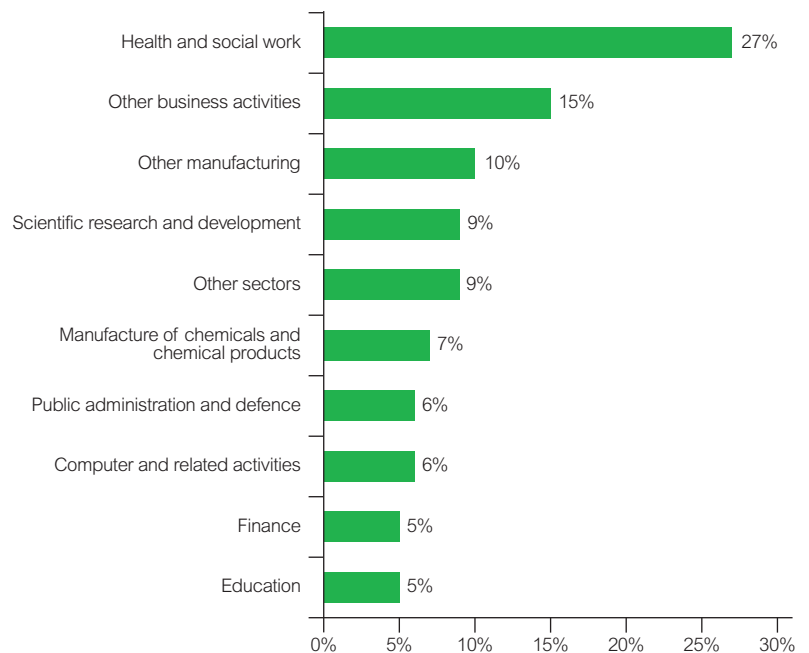


Figure 2.21 Key employment sectors of respondents working in other common doctoral occupations (at 3.5 years, N=470)

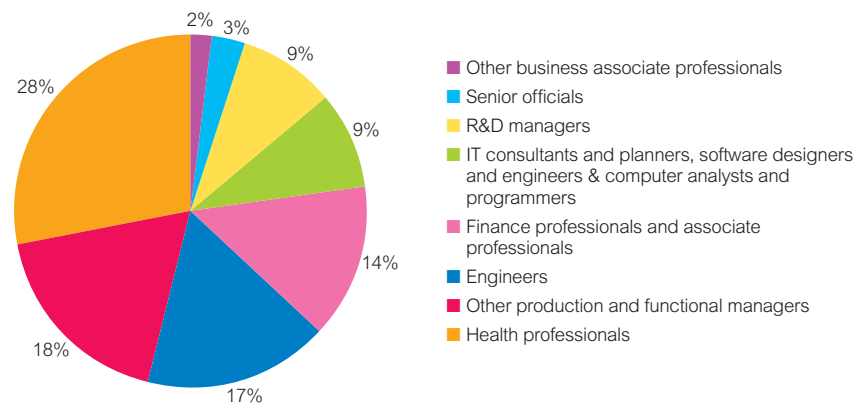


Figure 2.22 Occupations of respondents in other common doctoral occupations (at 3.5 years, N=470)

<sup>7</sup> For a full description of how this cluster was derived please refer to 'What do researchers do? Doctoral graduate destinations and impact three years on 2010: Methodology' Vitae (2010)

<sup>8</sup> Other business activities include: legal activities, accounting, market research, business/management consultancy, technical consultancy, technical testing and analysis, HR and recruitment activities.

### Examples of roles in other common doctoral occupations

- Chief Design Engineer for a robotics company
- Intellectual Property Manager for the NHS
- Solution Manager for a biotechnology group
- Senior Regulatory Executive for a pharmaceutical company
- Lead Clinical Psychologist for mental health services
- Electrical Design Engineer for a water treatment firm
- Head of Chemistry Manufacturing Operations for a pharmaceutical company
- Embedded Software Engineer for an oilfield services company
- Health economist for a health trust
- Senior Government Policy Advisor on international climate change
- Registrar and Consultant Physician for the NHS
- Assistant Tax Advisor for an accountancy firm
- Wastage Programme Analysis Manager for a food retailer
- Electronic Development Engineer for a electronics company
- Engineering Manager for a precious metal recovery company
- Consultant in an image-processing company
- Vehicle Dynamics Engineer for a motor racing company

### Progression within other common doctoral occupations

- Locum to Registrar to Consultant Physician in the NHS
- Assistant Tax Advisor to Tax Senior with an accountancy firm
- Senior Policy Officer to Policy Manager for a charity
- Deputy Branch Manager to Programme Analysis Manager
- Instrumentation Engineer to Electrical Design Engineer
- Process Specialist to Engineering Manager

Figure 2.23 Examples of jobs for respondents within the other common doctoral occupations cluster (N=470) and examples of progression within the cluster

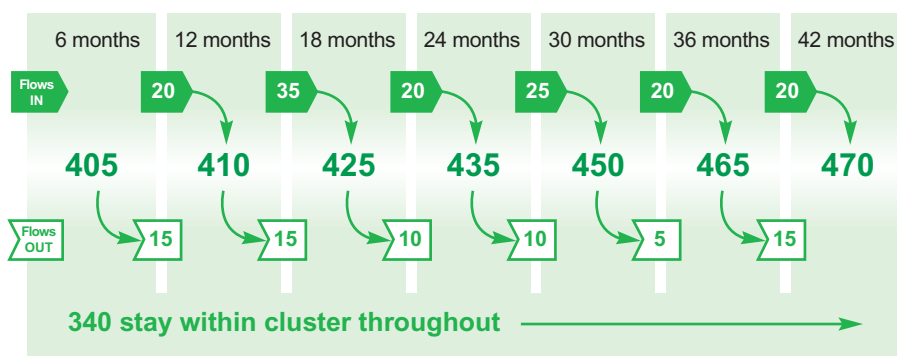


Figure 2.24 Other common doctoral occupations: movements in and out of cluster

Table 2.7 Common career paths followed by respondents starting in common doctoral occupations (N=405)

Rank	Career pathway after other common doctoral occupations	Respondents	%
1	Other common doctoral occupations throughout	340	84
2	Other occupations	15	3
3	HE research	10	2
3	Research (not in HE sector)	10	2
5	Teaching and lecturing in HE	5	2
6	Time out of the labour market	5	2
6	Other occupations before returning to a common doctoral occupation	5	2
6	Time out before returning to a common doctoral occupation	5	2
9	Other teaching occupations	<5	<1
Total (in most common pathways)		395	98
Total (starting in common doctoral occupations)		405	100

### Movement over time

84% stayed in common doctoral occupations throughout the survey period, although 43% reported more than one job during this time (Figure 2.24). Occupational descriptions suggest progression to more senior jobs, rather than movement to a different area of work. For many this appeared to take place within one organisation.

### Moving on from other common doctoral occupations

93% of doctoral graduate respondents starting in other common doctoral occupations followed five key pathways (Table 2.7). 16% moved out of common doctoral occupations into another cluster, most often to other occupations (3% of starters). Less than 5% of respondents left the cluster but returned later.

### Moving into other common doctoral occupations

25% moved into this cluster from another job or activity, most commonly from other occupations (23% of entrants), HE research jobs (19%) and research occupations outside of higher education (17%).

## 2.7 Other occupations

### Key statistics

- Consistently 16% of respondents were employed in the other occupations cluster over the three years
- 86% of respondents starting in this cluster followed five career pathways
- 60% of respondents stayed in this cluster throughout; 39% of these changed jobs within the survey period.
- 40% of respondents left the cluster; 9% moving into other common doctoral occupations, 7% into HE research and 6% into teaching and lecturing in HE
- 38% of respondents working in this cluster at the end of the survey moved in from other clusters; 19% from HE research occupations.

### Overview

This cluster included all remaining occupations not already covered by the previous clusters, i.e. those occupations where there are low proportions of doctoral graduates in the UK Labour Force Survey. This cluster was more common among doctoral graduate respondents from arts and humanities and social sciences disciplines than other disciplines.

The total number of respondents in this cluster remained stable over the survey period, at 16% (Figure 2.25).

At the time of the survey, almost half of respondents in the other occupations cluster were working in three main employment sectors; 15% in other business activities, 17% in education<sup>9</sup> and 15% in public administration, defence and social security (Figure 2.26).

Common occupations amongst this group were managers and proprietors in service industries (12%) and artistic and literary occupations (15%, including authors, writers, technical writers and editors (Figure 2.27). Examples of job titles are illustrated in Figure 2.28.

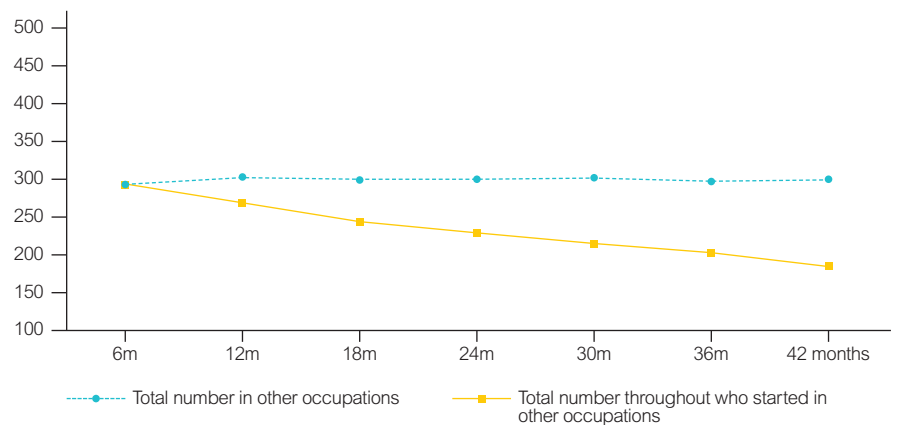


Figure 2.25 Respondents in other occupations over time

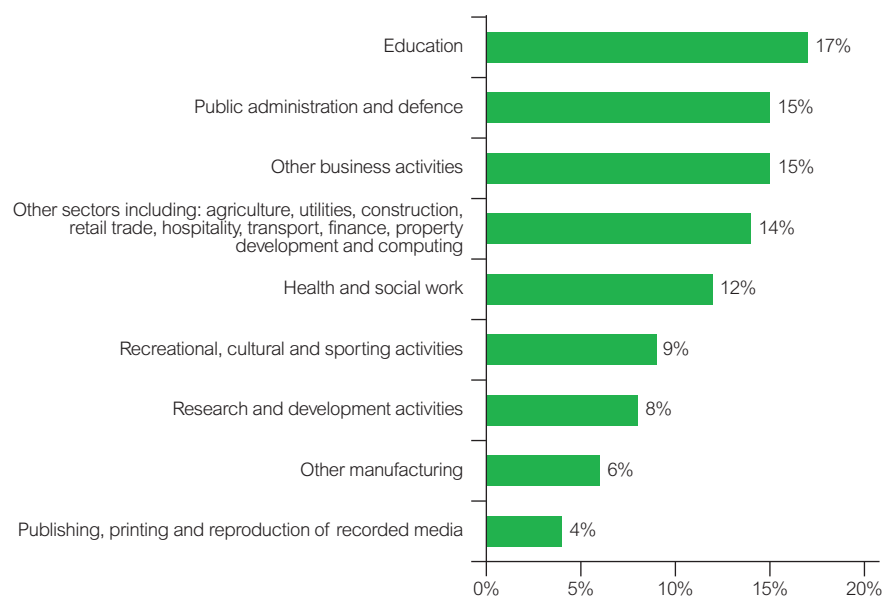


Figure 2.26 Key employment sectors for respondents in other occupations (at 3.5 years, N=265)

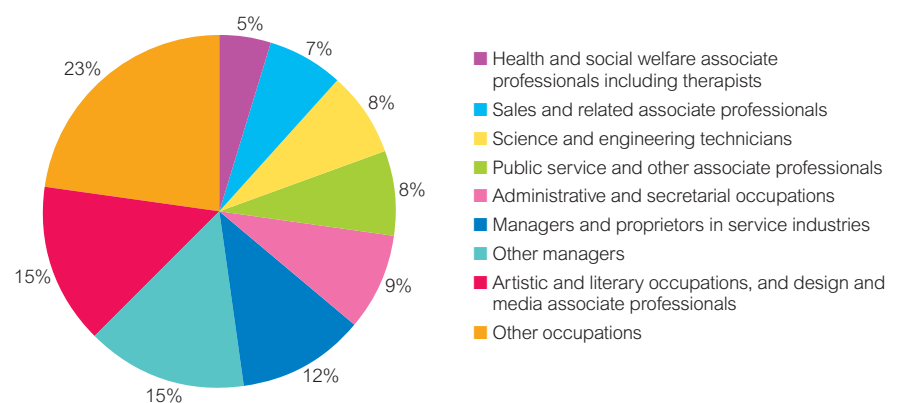


Figure 2.27 Occupation of respondents in other occupations at the time of the survey (N=265, 35 in known occupations)

<sup>9</sup>The occupations here differed from those in the research and teaching clusters, and included administrative jobs, IT/technical jobs, librarians, outreach workers, business development and student support occupations such as careers advisers and counsellors.

### Examples of roles in other occupations

- Projects Administrator for an engineering consultancy
- Head of Education for a gardening charity
- Curator of Antiquities and Numismatics for a museum
- Technical Sales Representative for a medical products company
- Assistant Speech and Language Therapist
- Technical Editor for a publishing company promoting the chemical sciences
- Technical Officer for local government
- Mapping and Charting Officer
- Technical Advisor for a defence sector company
- Chief Nursing Officer and Director of Patient Services
- Forensic Fire Investigator
- Crime Scene Investigator
- Environmental Health Technical Officer
- University Chemistry Teaching Laboratory Assistant
- Research Executive for a market research company
- Senior Archive and Teaching Assistant
- Administration Officer managing education projects
- Part-time Freelance IT Consultant advising small businesses
- Technical Officer for a not-for-profit computer systems company
- Production Operative for an electrical company
- Policy Officer for a charity
- Medical Writer

### Moving into teaching and lecturing in HE

- Lecturer in Bionanoscience
- Adjunct Lecturer for a university
- Teaching Fellow
- Academic Development Adviser
- Lecturer in Psychology

### Moving into other common doctoral occupations

- Technology Consultant
- Associate Patent Examiner
- Head of Education and Communications for an independent statutory body
- Clinical Trial Regulatory Consultant for the pharmaceutical industry

### Progression within other occupations

- Assistant Officer, Officer, Technical Officer and then Principal Officer in an environmental protection and regulation organisation
- Secretary to Projects Administrator
- Support Engineer to Senior Engineer for technical marketing
- Assistant Keeper to Keeper of Geology for a museum
- Assistant Editor to Editor for a publishing company

Figure 2.28 Examples of jobs within the other occupations cluster and movement within and between clusters

## Movement over time

Although the total number of respondents in the other occupations cluster remains fairly constant over time at 16% of the total, this disguises mobility within the other occupations cluster over time (Figure 2.29).

60% of respondents stayed in this cluster throughout the survey period and the majority of these (61%) only had one position throughout. 39% respondents moved jobs, either within the same organisation or to different companies.

## Moving on from other occupations

86% of respondents starting in the other occupations cluster followed five key pathways (Table 2.9). Almost two in five respondents moved into another cluster, most commonly to other common doctoral occupations (9%). Examples of job titles of those moving out of other occupations are illustrated in Figure 2.28. Almost 5% took time out of the labour market following initial employment in this cluster.

## Moving into other occupations

38% moved into this cluster from another job or activity, most commonly from HE research (19% of entrants) or from taking time out of the labour market (17% of entrants).

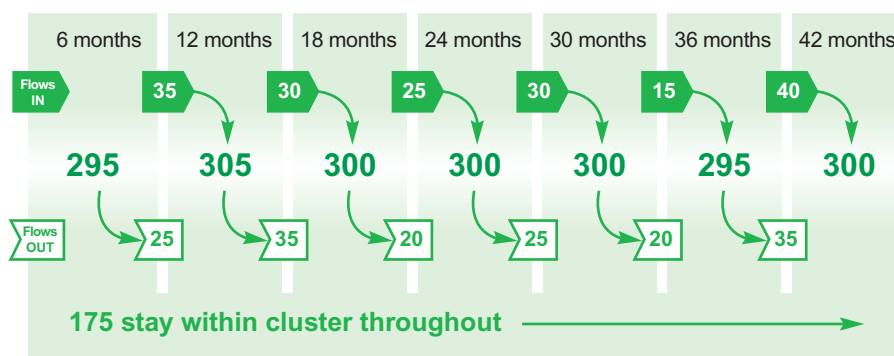


Figure 2.29 Other occupations: movements in and out of cluster

Table 2.9 Common career paths followed by respondents starting in other occupations (N=295)

Rank	Career pathway after other occupations	Respondents	%
1	Other occupations throughout	175	60
2	Other common doctoral occupations	25	9
3	HE research	20	7
4	Teaching and lecturing in HE	15	6
5	Research (not in HE sector)	10	4
6	Other teaching	5	2
7	Time out of the labour market	5	2
8	Time out before returning to other occupations	5	1
9	Further study	<5	1
9	HE research before returning to other occupations	<5	1
9	Research (not in HE sector) before returning to other occupations	<5	1
9	Other common doctoral occupations to time out of the labour market	<5	1
9	Time out to other common doctoral occupations	<5	1
	<b>Total (in most common pathways)</b>	<b>275</b>	<b>94</b>
	<b>Total (starting in other occupations)</b>	<b>295</b>	<b>100</b>

### 3 The career pathways of different disciplines

'What do Researchers do? Doctoral destinations and impact three years on'<sup>10</sup> identified that doctoral graduate respondents from different disciplines<sup>11</sup> tended to have different labour market outcomes. Approximately three and a half years after graduating, arts and humanities respondents were more likely to be in teaching and lecturing in HE than in any other occupational cluster. Biological sciences respondents were most likely to be either in HE research or research (not in HE sector) occupations; biomedical sciences respondents were most likely to be in other common doctoral occupations, or slightly less frequently to be in HE research jobs; physical sciences and engineering respondents were also most likely to be in other common doctoral occupations; and those from the social sciences were most likely to be in teaching and lecturing in HE occupations.

In this chapter we describe the employment outcomes of doctoral graduate respondents from the different discipline groups with illustrations of respondents' occupations. We then move on to explore the career pathways for these different groups of doctoral graduates and discuss their movement and mobility between the clusters.

#### 3.1 Arts and humanities

##### Key statistics

- The proportion of arts and humanities respondents in employment increased from 78% to 83% over three years, 7% remained in non-labour market activity throughout
- More than two-fifths of all arts and humanities respondents (42%) were in the teaching and lecturing in HE cluster at six months, increasing steadily to 46% over three years
- 255 respondents followed 58 career pathways over the survey period with 15% describing a unique career path
- 58% of respondents followed five common pathways, almost half (28%) in HE teaching and lecturing occupations throughout

##### Overall

Of the doctoral graduates responding to the survey, 255 had studied arts and humanities subjects (12%). This group includes respondents who had studied history; English, modern languages, theology, linguistics and ancient and classical languages.

Six months after graduation 67% were in employment in the UK and 11% were working overseas. A higher number in this discipline (22%) were either in further study, assumed unemployed or not available for work or study (essentially taking time out of the labour market for reasons such as travelling, retirement or maternity) compared to other disciplines. Three years later almost three quarters (71%) of this group were in employment in the UK, and a further 12% were employed overseas.

7% of arts and humanities respondents remained in non-labour market activity throughout the survey period, including further study, compared to, for example, only 1% of biomedical sciences respondents.

Throughout the survey period, teaching and lecturing in HE was by far the most common cluster for arts and humanities doctoral graduates, accounting for 42% of employed respondents at six months and rising to almost half (46%) (Figure 3.1).

The majority of arts and humanities respondents in teaching and lecturing in HE occupations were working as lecturers (64%), some were in professorial jobs (14%), and fewer than 10% were working as teaching assistants. Examples are illustrated in Figure 3.2.

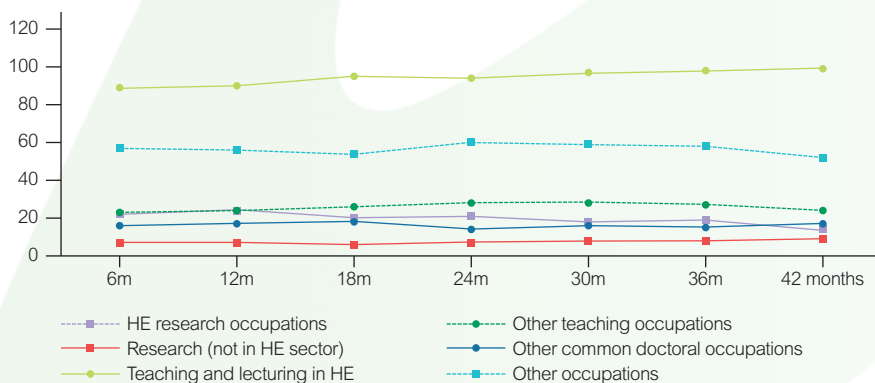


Figure 3.1 Occupational clusters over time for arts and humanities respondents (at 3.5 years, N=215)

- Examples of jobs in the teaching and lecturing in HE cluster include:
- Adjunct Professor of English Literature (working overseas)
  - Assistant Professor of French (Applied Linguistics) (working overseas)
  - Course Leader for Deaf Studies
  - Dean of the Faculty of Art and Design

Figure 3.2 Examples of jobs for arts and humanities respondents within the teaching and lecturing in HE cluster

<sup>10</sup> What do researchers do? Doctoral graduate destinations and impact three years on' (Vitae, 2010)

<sup>11</sup> Discipline of study was coded using information from the DLHE response using the Joint Academic Coding System (JACS) codes as established in 'What do researchers do? First destinations of doctoral graduates by subject' (Vitae, 2009)

The other occupations cluster was also relatively important to arts and humanities respondents however, the numbers in this cluster vary over time.

Arts and humanities respondents in the other occupations cluster were working in a range of employment sectors, including education. The numbers were too small to report.

Common occupations for arts and humanities respondents were legal and business professionals (23%, including clergy, 12% and curators, 8%), artistic and literary occupations (21%, including authors/writers and arts officers) and administrative and secretarial occupations (15%) (Figures 3.3 and 3.4).

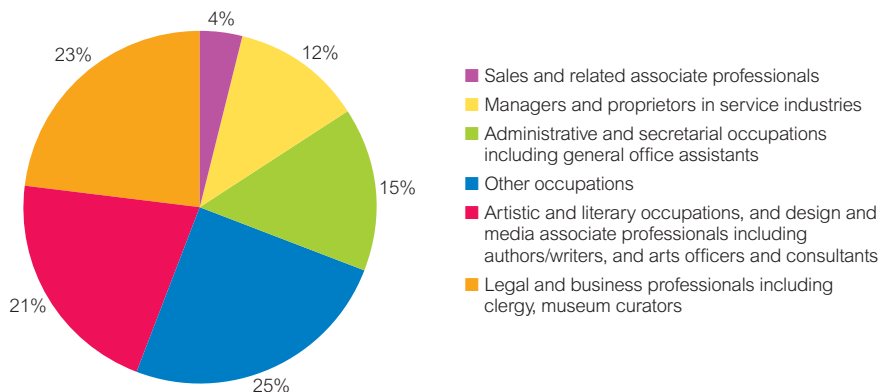


Figure 3.3 Occupations of arts and humanities respondents in the other occupations cluster (N>50)

### Movement over time

58 different career paths were described by over 250 arts and humanities doctoral graduate respondents. 72% of arts and humanities respondents followed nine common career pathways (Table 3.1). Teaching and lecturing in HE throughout the survey period accounted for over one quarter (28%) of all arts and humanities doctoral graduate respondents. Four in five of the respondents starting in these occupations after graduation were still in the same or similar job three years on.

There was little evidence of movement between occupational clusters, with a small number (4%) moving into teaching and lecturing in HE from HE research jobs, and fewer still moving from the other occupations cluster into teaching and lecturing in HE.

Examples of jobs in the other occupations cluster include:

- Museum Collections Manager
- Investigations Executive investigating advertising complaints
- Office Team Leader in Customer Services
- Part-time Examinations Assistant
- Fraud Prevention Manager
- Solicitor in Employment Law

Figure 3.4 Examples of jobs for arts and humanities respondents within the other occupations cluster

Table 3.1 Common career paths followed by arts and humanities respondents (N=255)

Rank	Career pathway	Respondents	%
1	Teaching and lecturing in HE throughout	70	28
2	Other occupations throughout	35	14
3	Time out of the labour market throughout	15	6
4	Other teaching occupations throughout	15	6
5	Other common doctoral occupations throughout	10	4
6	HE research then teaching and lecturing in HE	10	4
7	HE research throughout early	5	2
8	Other occupations then teaching and lecturing in HE	5	2
9	Teaching and lecturing in HE then time out of the labour market	5	2
<b>Total (in most common pathways)</b>		<b>185</b>	<b>72</b>
<b>Total (from arts and humanities disciplines)</b>		<b>255</b>	<b>100</b>

## 3.2 Biological sciences

### Key statistics

- The proportion of biological sciences respondents in employment increased from 79% to 92% over three years
- 62% of all biological sciences respondents were in research occupations (34% in HE and 28% in non-HE research), decreasing steadily to 28% and 23%, respectively, over three years. Teaching occupations were relatively uncommon
- 280 respondents followed 70 career pathways over the survey period with 14% describing a unique career path
- 53% of respondents followed five common pathways over the survey period, 19% in HE research, 14% in wider research and 9% in other common doctoral occupations throughout the period

### Overview

280 doctoral graduate respondents were from the biological sciences disciplines (13%). This group includes those who studied biology, biochemistry, molecular biology, biophysics, microbiology and agriculture.

Six months after graduating 71% were in employment in the UK and 8% were working overseas. The balance were studying, taking time out or unemployed. Three years later 79% were in employment in the UK and a further 13% were working overseas.

Throughout, HE research and other research occupations were the most common clusters for biological sciences doctoral graduate respondents. At six months, 34% of biological sciences respondents in employment (regardless of location) were in HE research and 28% were in other research occupations outside the HE sector. However the numbers in these jobs falls over time, and three years later these clusters accounted for 28% and 23% respectively (Figure 3.5).

Other common doctoral occupations and other occupations became relatively more important to biological sciences doctoral graduates over time. Teaching occupations, either in higher education or beyond, were considerably less common for biological sciences doctoral graduates over this period, and the numbers in these jobs changed very little over time.

Biological science respondents were the most likely to change occupational clusters during the survey period (44%) compared to, for example, only 30% of social science and biomedical science respondents.

Biological sciences doctoral graduate respondents working in research outside of higher education were employed in a range of employment sectors, almost half (48%) in scientific research and development. The health and social work sector (22%), and manufacture of chemicals and chemical products (15%) were also important employment sectors (Figure 3.6). Examples of job titles for biological sciences respondents are illustrated in Figure 3. 7.

### Movement over time

70 different career paths were described by biological sciences respondents. Two thirds (65%) followed the ten most common pathways with HE research throughout the survey period accounting for almost one in five (19%) of all respondents (Table 3.2). There was some evidence of movement between clusters, but with no real consistent patterns.

Of those biological sciences doctoral researchers starting in HE research the majority (63%) stayed in HE research throughout the survey period, with 7% moving into research careers outside HE and 4% moving into each of the teaching and lecturing in HE, other common doctoral occupations and other occupation clusters.

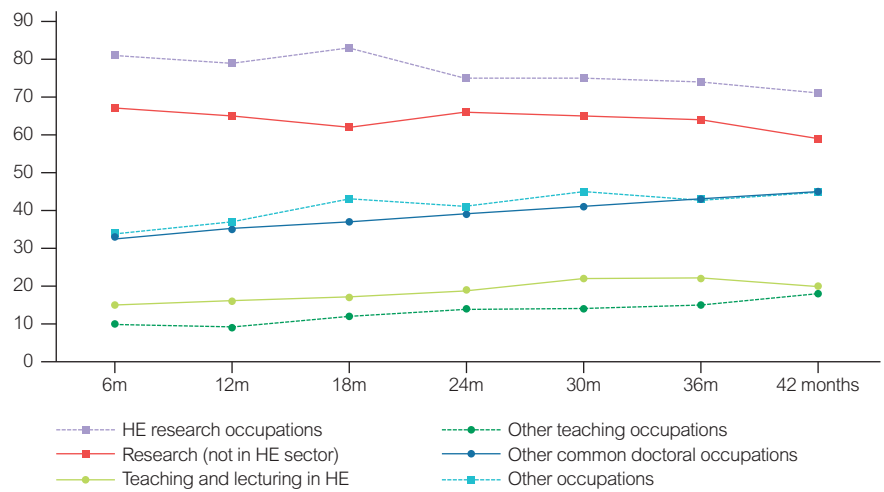


Figure 3.5 Occupational clusters over time for biological sciences respondents (at 3.5 years, N=260)

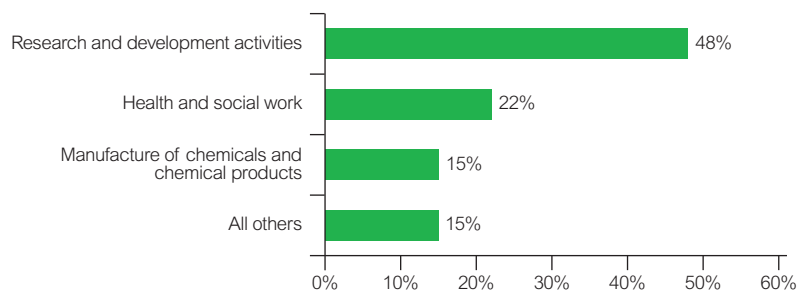


Figure 3.6 Employment sectors for biological sciences respondents (N=60)

Examples of jobs in the HE research cluster include:	Examples of jobs outside HE include:	
■ Postdoctoral Research Associate	■ Veterinary Pathologist	■ Assay Development and Validation Scientist for a pharmaceuticals company
■ Clinical Trial Co-ordinator	■ Senior Cell Scientist for a pharmaceuticals company	■ Senior Environmental Scientist for a charity
■ Consultant Oncologist researching cancer	■ Senior Clinical Biochemist for the NHS	■ Senior Sensory Scientist for a fragrance house
■ Career Development Fellow in health research	■ Air Quality Meteorologist for the government	

Figure 3.7 Examples of research jobs for biological sciences respondents within both the HE and other sectors

Table 3.2 Common career paths followed by biological sciences respondents (N=280)

Rank	Career pathway	Respondents	%
1	HE research throughout	55	19
2	Research (not in HE) throughout	40	14
3	Other common doctoral occupations throughout	25	9
4	Other occupations throughout	20	7
5	Teaching and lecturing in HE throughout	10	4
6	Other teaching occupations throughout	5	3
7	HE research then research (not in HE)	5	2
7	Research (not in HE) then other occupations	5	2
7	Time out of the labour market then other occupations	5	2
10	Research (not in HE) then HE research	5	2
10	Other occupations then other common doctoral occupations	5	2
	<b>Total (in most common pathways)</b>	<b>180</b>	<b>65</b>
	<b>Total (from biological sciences disciplines)</b>	<b>280</b>	<b>100</b>

## 3.3 Biomedical sciences

### Key statistics

- The proportion of biomedical sciences respondents in employment increased from 88% to 93% over three years
- Around a third of all biomedical sciences respondents were employed in other common doctoral occupations; predominately in the health and social work sector. HE research occupations were also relatively common but decreased over time
- Two thirds of respondents followed five common pathways over the survey period. 26% were in other common doctoral occupations throughout, 16% in HE research and 13% in teaching and lecturing in HE
- 280 respondents followed 70 career pathways over the survey period with 7% describing a unique career path

### Overview

Of the doctoral graduates responding to the survey, 475 (23%) had studied biomedical sciences subjects. This group included respondents who had studied: medicine, psychology, pharmacology, toxicology, pharmacy, anatomy, physiology, pathology and nursing.

Six months after graduation 82% were in employment in the UK and 6% were working overseas. Three years later 85% were in employment in the UK and a further 8% were working overseas; the highest employment rate of all the disciplines.

Biomedical sciences was the most stable discipline grouping, with 70% of respondents staying within the same occupational cluster throughout. Only 1% of respondents took time out of the labour markets, including further study, compared to, for example, 7% of arts and humanities respondents.

Throughout the survey period, other common doctoral occupations was the most common cluster for biomedical sciences respondents, accounting for 34 to 35% of employed respondents (Figure 3.8). Within this cluster, the most common employment sector was health and social work, accounting for almost three quarters (72%) of respondents (Figure 3.9). The most common occupations within this cluster were clinical psychologists (35%), specialist registrars, consultants and general practitioners (32%), and other health professionals (8%, including educational psychologists) (Figure 3.10). This may reflect the increasing numbers of mid-career professionals completing doctoral studies. Other common occupations in this cluster were managers and senior officials (13%). Examples are illustrated in Figure 3.11.

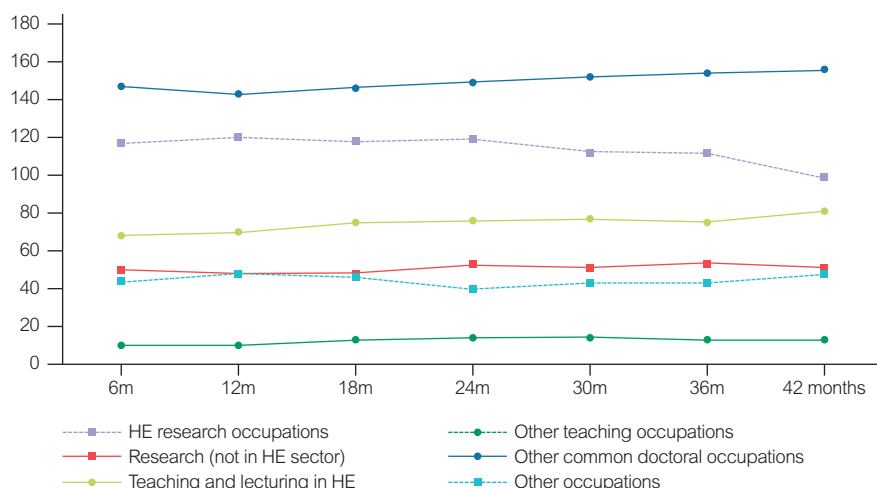


Figure 3.8 Occupational clusters over time for all biomedical sciences respondents (at 3.5 years, N=450)

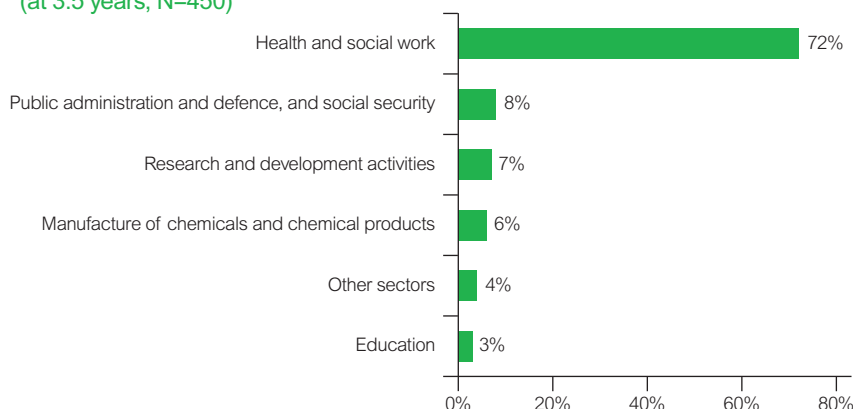


Figure 3.9 Employment sectors of biomedical sciences respondents in other common doctoral occupations (N=155)

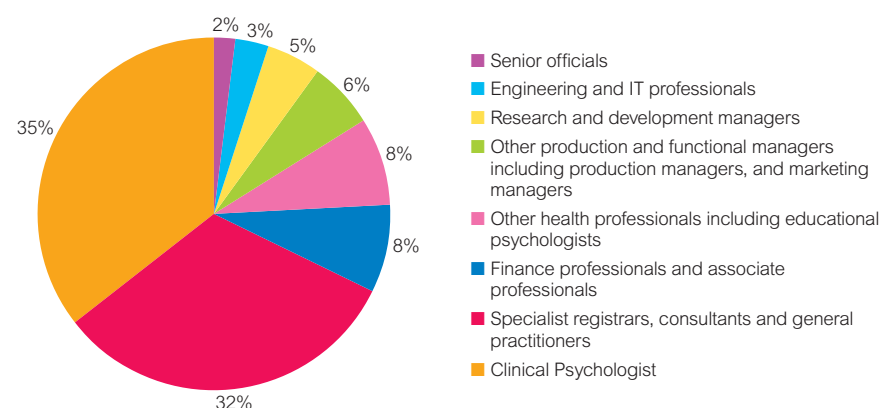


Figure 3.10 Occupations of biomedical sciences respondents in other common doctoral occupations at the time of the survey (N=155)

#### Examples of jobs in the other common doctoral occupations cluster include:

- Lead Clinical Psychologist for mental health services
- Head of Chemistry Manufacturing Operations for a pharmaceuticals company
- Senior House Officer for the NHS
- Senior Regulatory Executive for a pharmaceuticals company
- Programme Manager for a Research Council
- Consultant Educational Psychologist for a local authority
- Business Development Manager for a university

Figure 3.11 Examples of occupations for biomedical sciences respondents within the other common doctoral cluster

HE research was the next most common occupational cluster (27%) for biomedical sciences respondents, but declined over time. Numbers of respondents in teaching and lecturing in HE increased gradually over time (to 18%). Biomedical sciences respondents researching outside of HE and in other occupations were less common and fairly static over time. Other teaching occupations hardly featured in the career paths of respondents from biomedical sciences subjects.

### Movement over time

70 different career paths were described by biomedical sciences respondents. Three quarters of respondents followed the ten most common career pathways (Table 3.3).

Other common doctoral occupations throughout the survey period accounted for over one quarter (26%) of all biomedical sciences respondents. 84% of these respondents were in the same job throughout the three years. A small number of respondents (1%) moved into other common doctoral occupations from research jobs (either in HE or beyond).

Table 3.3 Common career paths followed by biomedical sciences respondents (N=475)

Rank	Career pathway	Respondents	%
1	Other common doctoral occupations throughout	125	26
2	HE research throughout	75	16
3	Teaching and lecturing in HE throughout	60	13
4	Research (not in HE) throughout	35	8
5	Other occupations throughout	25	6
6	HE research then research (not in HE)	5	2
7	Other occupations then HE research	5	2
8	Other teaching occupations throughout	5	1
9	HE research then other common doctoral occupations	5	1
10	HE research then further study	5	1
<b>Total (in most common pathways)</b>		<b>355</b>	<b>75</b>
<b>Total (from biomedical sciences disciplines)</b>		<b>475</b>	<b>100</b>

16% of respondents were in HE research throughout the three years. Two thirds (63%) of those starting in HE research after graduation were still in the same or a similar job after three years. 6% of these respondents moved into research outside HE and 5% moved into both other common doctoral occupations and further study.

Teaching and lecturing in HE was the most stable career path over time, with nearly all of the respondents who were in this cluster at six months still there three years on. 4% of biomedical sciences respondents starting in HE research moved into teaching and lecturing in HE.

## 3.4 Physical sciences and engineering

### Key statistics

- The proportion of physical sciences and engineering respondents in employment increased from 81% to 94% over three years
- 27% of all physical sciences and engineering respondents were in other common doctoral occupations, increasing to 32% over three years. 26% started in HE research, declining to 18% over the period. Around 18% were employed consistently in the non-HE research cluster
- 695 respondents followed 99 career pathways over the survey period with 8% describing a unique career path
- 60% of respondents followed five common pathways over the survey period. 21% in common doctoral occupations throughout, 12% in HE research and 11% in non-HE research throughout the period

### Overview

695 doctoral graduate respondents were from the physical sciences and engineering disciplines (34%). This group included those who studied chemistry, physics, mathematics, computer science, physical and terrestrial geographical and environmental sciences, geology, electronic and electrical engineering, civil engineering, mechanical engineering, other physical sciences, other engineering and building.

Six months after graduating 69% were in employment in the UK and 12% were working overseas. Three years later 79% were in employment in the UK with a further 15% working overseas, the highest of all the disciplines.

At six months, other common doctoral occupations (27%) was the most common occupational cluster for physical sciences and engineering respondents in employment, increasing over time to account for a third of respondents (32%) (Figure 3.12).

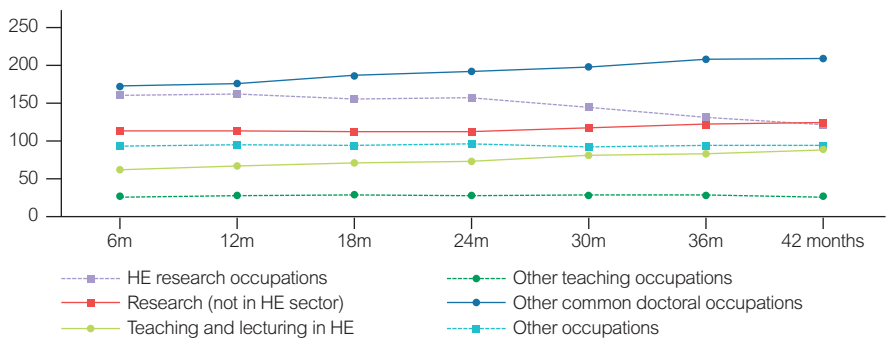


Figure 3.12 Occupational clusters over time for physical sciences and engineering respondents (at 3.5 years, N=665)

The most common employment sectors for respondents working in this cluster were other business activities (23%), computer and related activities (14%), financial activities (9%) and research and development activities (9%) (Figure 3.13).

The most common occupations were engineering professionals (23%), business and finance professionals and associate professionals (17%), senior officials and functional managers (14%), design and development engineers (12%), and software designers and engineers (12%) (Figures 3.14 and 3.15).

HE research occupations was the next most common occupational cluster (26%) for physical sciences and engineering respondents six months after graduation, declining over three years to only 18% of respondents; a very similar proportion to those in research occupations outside of the HE sector.

Numbers of respondents in the non-HE research cluster and in the other occupations cluster were fairly consistent over time, while the numbers of respondents employed in teaching and lecturing in HE increased over time from a relatively low base. Very few physical sciences and engineering respondents worked in other teaching occupations over the three years.

### Movement over time

99 different career paths were described by 695 physical sciences and engineering respondents. 60% of respondents followed five common career pathways, all of which involved staying in the same occupational cluster throughout the survey period (Table 3.4).

A fifth of all physical sciences and engineering respondents (21%) were employed in other common doctoral occupations throughout the survey period. Generally those who started in this cluster after graduation were still in the same job three years on (86%).

12% of all respondents were in HE research throughout the three years, over a half re still in the same job after three years. The balance mainly left to work in the wider research cluster (12%), teaching and lecturing in HE (9%), other common doctoral occupations (8%) and other occupations (8%).

A similar proportion of respondents (11%) were in research outside of HE throughout the period of the survey. Approximately two thirds of these starting in this cluster after graduation were still in these occupations three years on.

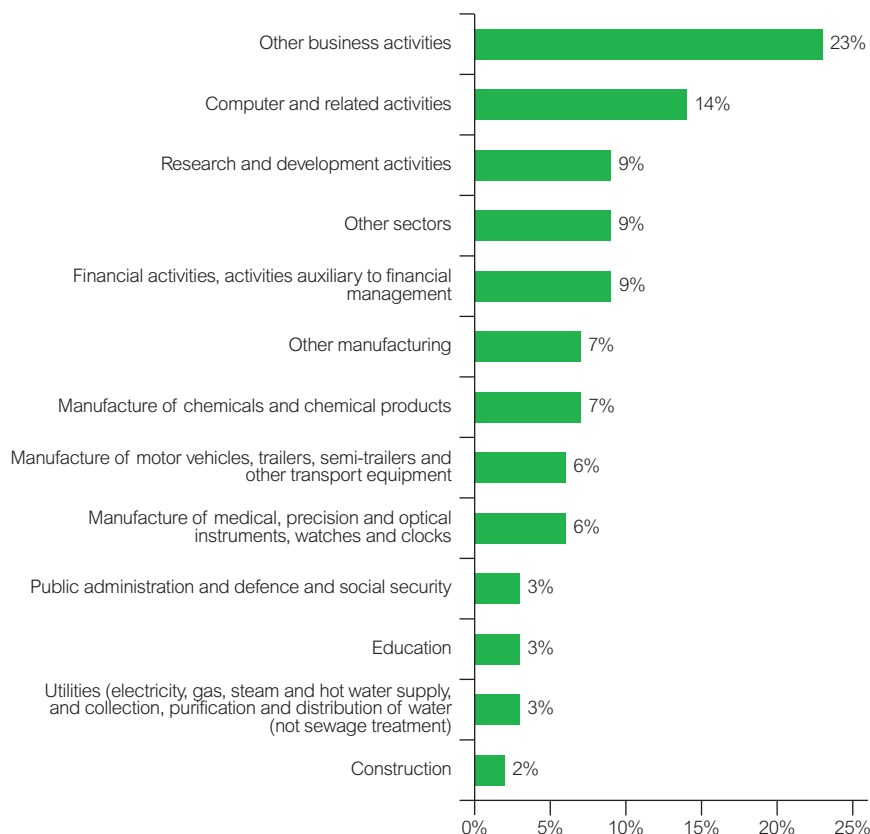


Figure 3.13 Employment sectors of physical sciences and engineering respondents in other common doctoral occupations (N=210)

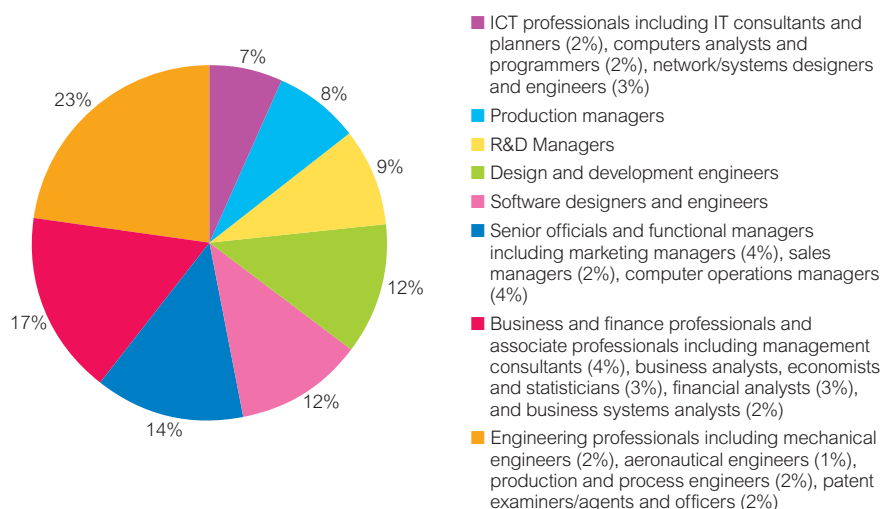


Figure 3.14 Occupations of physical sciences and engineering respondents in other common doctoral occupations (N=210)

Examples of jobs in the other common doctoral occupations cluster include:

- Supply Chain Consultant
- Vehicle Dynamics Engineer
- Product Development Engineer
- Actuarial Trainee in a pensions consultancy
- Patent Examiner
- Credit Risk Analyst in a bank
- Global Energy Manager
- Senior Analyst/Statistician
- Intellectual Property Manager for the NHS
- Aerodynamics Engineer in flight physics
- Intellectual Property Manager for the NHS

Figure 3.15 Examples of job titles for physical sciences and engineering respondents within the other common doctoral occupations cluster

37% of respondents moved between clusters, particularly from HE research into a range of other clusters including research (not in HE sector), teaching and lecturing in HE, other common doctoral occupations or other occupations.

Physical sciences and engineering respondents also moved into other common doctoral occupations from other occupations and HE research clusters (4%).

Of those physical sciences and engineering respondents who started in HE research after graduation, 53% stayed in this cluster throughout the three years, 12% moved into research outside of higher education, 9% to teaching and lecturing in HE, 8% to other common doctoral occupations and 8% to other occupations.

Table 3.4 Common career pathways for physical sciences and engineering respondents (N=695)

Rank	Career pathway	Respondents	%
1	Other common doctoral occupations throughout	150	21
2	HE research throughout	85	12
3	Research (not in HE) throughout	80	11
4	Teaching and lecturing in HE throughout	55	8
5	Other occupations throughout	55	8
6	HE research then research not in HE	20	3
7	Other teaching occupations throughout	20	3
8	HE research then teaching and lecturing in HE	15	2
9	Other occupations then other common doctoral occupations	15	2
10	HE research then other common doctoral occupations	10	2
10	HE research then other occupations	10	2
Total (in most common pathways)		510	73
Total (from physical sciences and engineering disciplines)		695	100

### 3.5 Social sciences

#### Key statistics

- The proportion of social sciences respondents in employment increased from 83% to 89% over three years
- 40% of all social sciences respondents were in teaching and lecturing in HE, increasing to 42% over three years
- 255 respondents followed 58 career pathways over the survey period with 13% describing a unique career path
- 63% of respondents followed five common pathways over the survey period with almost a third (31%) in teaching and lecturing in HE throughout

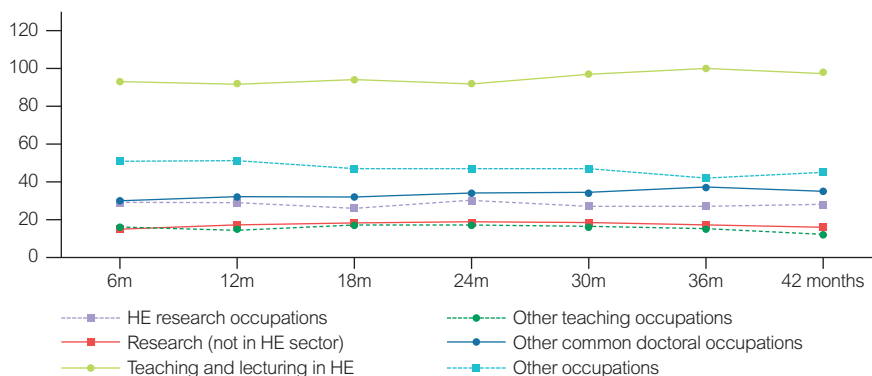


Figure 3.16 Occupational clusters over time for social sciences respondents (at 3.5 years, N=235)

#### Overview

Of the doctoral graduates responding to the survey, 255 respondents had studied social sciences subjects (12%). This group included respondents who studied business and management, sociology, politics, economics, human and social geography, and law.

Six months after graduating, 66% were in employment in the UK and 17% were working overseas. Three years later 71% were in employment in the UK and a further 18% were working overseas<sup>12</sup>.

Throughout the survey period, teaching and lecturing in HE was by far the most common cluster for social sciences respondents, accounting for 40% at six months and increasing after two years

to 42% (Figure 3.16). Most commonly social sciences respondents in HE teaching and lecturing were working as lecturers (77%), some were in professorial posts (12%) and few were working as teaching assistants (3%) (Figure 3.17)

The other occupations cluster was the next most common cluster for social sciences respondents (20%), declining slightly over time. Other common doctoral occupations and HE research occupations both employed approximately a quarter of respondents over the survey period. Research outside the HE sector and other teaching occupations employed less than 13% of social sciences respondents throughout the survey period.

#### Examples of jobs in the teaching and lecturing in HE cluster include:

- Senior Lecturer
- Affiliate Lecturer
- Teaching Fellow
- Head of Department and Senior Lecturer
- Reader in Law
- Module Convenor
- Lecturer in Science Communication
- Assistant Professor of Strategy (overseas)
- Programme Leader in work-based learning

Figure 3.17 Examples of occupations for social sciences respondents within the teaching and lecturing in HE cluster

<sup>13</sup> This reflects the relatively high proportion of EU-domiciled social science doctoral graduates, compared to other disciplines.

## Movement over time

58 different career paths were described by 255 social sciences respondents. Almost two thirds (63%) followed five common career pathways, all of which involved staying in the same occupational cluster throughout the survey period (Table 3.5).

Teaching and lecturing in HE throughout the survey period accounted for almost a third (31%) of all social sciences respondents. Generally those who started in these occupations after graduation were in the same job three years on (85%).

13% of respondents were in the other occupations cluster throughout the survey period. Approximately two thirds (65%) starting in this cluster after graduation were still in these occupations three years later.

10% of social sciences respondents were employed in other common doctoral occupations throughout the three years.

For those social sciences respondents starting in HE research, the majority stayed in HE research throughout the survey period, with some moving on to teaching and lecturing in HE, while others took time out of the labour market. There was also some evidence of movements between other occupational clusters, but the numbers involved were too small to report.

Table 3.5 Common career pathways for social sciences respondents (N=255)

Rank	Career pathway	Respondents	%
1	Teaching and lecturing in HE throughout	80	31
2	Other occupations throughout	35	13
3	Other common doctoral occupations throughout	25	10
4	HE research throughout	15	5
5	Research (not in HE) throughout	10	4
6	Time out of the labour market throughout	10	4
7	Other teaching occupations throughout	10	4
8	HE research then teaching and lecturing in HE	10	3
9	Other occupations then other common doctoral occupations	5	2
	<b>Total (in most common pathways)</b>	<b>190</b>	<b>75</b>
	<b>Total (from social sciences disciplines)</b>	<b>255</b>	<b>100</b>



The Institute for Employment Studies is an independent, apolitical, international centre of research and consultancy in public employment policy and organisational human resource issues. It works closely with employers in the manufacturing, service and public sectors, government departments, agencies, and professional and employee bodies. For over 40 years the Institute has been a focus of knowledge and practical experience in employment and training policy, the operation of labour markets, and human resource planning and development. IES is a not-for-profit organisation which has over 70 multidisciplinary staff and international associates. IES expertise is available to all organisations through research, consultancy, publications and the Internet.



## Vitae

Vitae is supported by Research Councils UK (RCUK), managed by CRAC: The Career Development Organisation and delivered in partnership with regional Hub host universities.

Vitae works with UK higher education institutions (HEIs) to embed professional and career development in the research environment. Vitae plays a major role in innovating, sharing practice and enhancing the capability of the higher education sector to provide professional development and training for researchers.

Our vision is for the UK to be world-class in supporting the personal, professional and career development of researchers.

Our aims:

- build human capital by influencing the development and implementation of effective policy relating to researcher development
- enhance higher education provision to train and develop researchers
- empower researchers to make an impact in their careers
- evidence the impact of professional and career development support for researchers.

For further information about the range of Vitae activities go to [www.vitae.ac.uk](http://www.vitae.ac.uk) or contact [website@vitae.ac.uk](mailto:website@vitae.ac.uk)

Vitae c/o CRAC, 2nd Floor, Sheraton House, Castle Park, Cambridge, CB3 0AX

ISBN: 978-1-906774-27-1