

What do researchers do?

Doctoral graduate employment, activities and earnings



September 2022

www.**vitae**.ac.uk



- Vitae has previously published extensively our analysis of early career destinations of doctoral graduates, using HESA's 'Destinations of Leavers from HE' (DLHE) surveys at 6 months and 3.5 years after graduation
- HESA replaced DLHE with new annual 'Graduate Outcomes' (GO) survey at 15 months, first run as pilot in 2019 for 2017/18 graduates. GO data is not directly comparable with DLHE
- GO coverage is wider including all international students. However, certain questions specific to doctoral graduates are within optional question banks resulting in smaller response numbers
- Results here focus on GO survey of 2018/19 doctoral graduates, when more universities opted into the additional questions
- Certain data from LEO (Longitudinal Education Outcomes, which apply to England) are cited to compare doctoral graduate earnings with those at other degree levels¹
- 1. Statistics: higher education graduate employment and earnings GOV.UK www.gov.uk



- Following the practice adopted in recent What do researchers do? reports²,
 we report employment destinations on the basis of 'occupational clusters'
 based on a combination of industry sectors (SIC) and occupational categories
 (SOC)
- Past analyses show these clusters aid understanding of destinations of doctoral graduates, for example enabling identification of research-only posts from teaching and other roles in a university
- The 'Other common doctoral occupations' cluster comprises jobs that labour market data reveal relatively large numbers or percentages of workers with a doctorate. These include health professionals, engineering and IT professionals, certain managerial roles etc³

- 2. What do researchers do? www.vitae.ac.uk/WDRD
- 3. What do researchers do? Doctoral graduate destinations and impact three years on, Methodology, Vitae 2010 www.vitae.ac.uk/vitae-publications/reports/what-do-researchers-do-wdrd-methodology-vitae-16-dec.pdf



EMPLOYMENT CIRCUMSTANCES

- Doctoral graduates were highly employable, with more than 90% in work or work and further study, which was higher than for contemporaneous undergraduates (UG) and masters (M) graduates
- Science, technology, engineering and mathematics (STEM) doctoral graduates were more likely to be in full-time work than humanities, arts or social science (HASS) doctoral graduates
- A much smaller proportion of UK doctoral graduates went abroad after doctoral study than the proportion of non-UK doctoral graduates who remained in the UK

EMPLOYMENT

- Just under half of all doctoral graduates were employed in higher education (HE) higher for HASS (especially social sciences, 72%) than for STEM doctoral graduates
- Only 10% were in research jobs outside HE, whereas 27% were employed in Other common doctoral occupations
- There were major variances in occupations by discipline

HE CAREERS

- Biological sciences (BS) doctoral graduates were most likely to be employed in HE research (37%)
 and arts and humanities (AH) least likely (16%)
- Half of social sciences (SS) doctoral graduates were employed in HE teaching, compared to less than 10% of STEM doctoral graduates
- The proportion of those working in HE research roles employed on a fixed-term contract (89%)
 was much higher than in HE teaching roles (27%) or all other roles (21%)
- There were a significantly higher proportion of AH doctoral graduates in HE teaching on fixed term contracts
- There were only very small differences in earnings by gender or ethnicity within any HE cluster



EARNINGS

- Most doctoral graduates earned more than UG graduates, with doctoral graduate median earnings after one year higher than those for UG graduates after five years and for masters graduates after three years
- Median salaries were very similar for doctoral graduates in HE research (£34k) and research outside HE (£35k), although the latter salaries were more widely spread
- Those in Other common doctoral occupations commanded a higher median salary (£40k) and had more of the highest earners
- Median earnings were highest for biomedical sciences (BMS) and SS doctoral graduates (£38k)
 and lowest (£34k) for BS and AH doctoral graduates

VALUE OF THE DOCTORATE

 62% of employed doctoral graduates said their doctorate was required for their job, with an additional 24% saying it was an advantage in getting the job

JOB FIT

- 80-95% of employed doctoral graduates felt positive about their work, that it used their skills/ knowledge, was meaningful, and fitted their overall career plans
- 70% used their research skills, while over 60% conducted or interpreted/evaluated research although these percentages differed strongly by occupational cluster



OUTCOMES FOR DIFFERENT GROUPS

- The proportion in full-time work was consistent across main ethnicity groups although lower for females and disabled doctoral graduates
- Unemployment was higher amongst ethnic minorities (4%): double the rate amongst white doctoral graduates
- There were very few differences in destinations in terms of occupational cluster between males and females, or for disabled doctoral graduates
- A slightly higher proportion of white graduates entered HE jobs than of ethnic minority graduates, when viewed across all subjects, while more of the ethnic minority graduates entered Other common doctoral occupations
- Overall, median earnings were similar for males and females (£36k), while somewhat higher for ethnic minorities (£38k)

PROFILE OF THE GRADUATE OUTCOMES SURVEY POPULATION

- Just over half of doctoral graduates were of UK domicile, with variations by discipline
- 36% were self-funded, rising to 45% in HASS: overall 15% studied part-time
- Just under half of all doctoral graduates (48%) were female (highest at 65% in biomedical sciences)
- 34% were over 30 years old when they started doctoral study (over 40% of HASS doctoral graduates)
- 16% of UK domiciled doctoral graduates were of ethnic minority background
- 7% (but 11% of UK domiciles) reported a disability or learning condition



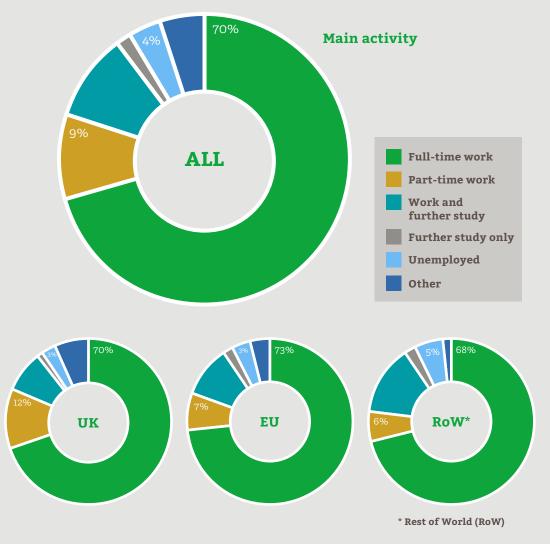
Doctoral graduate outcomes

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Overall circumstances

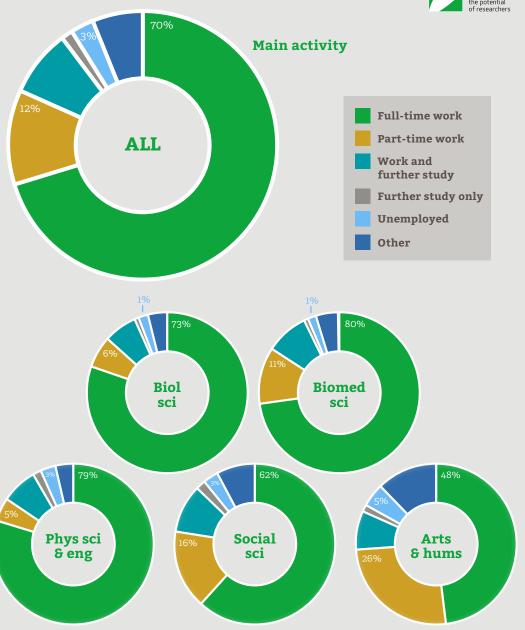
- The vast majority of doctoral graduates were working in some way, and very few were unemployed
- 70% entered full-time work but around 3% were unemployed
- This compares with 55% of first-degree graduates in full-time work,
 20% in further study and 5%
 unemployed (and 64%, 14% and 3% respectively of taught postgraduates)
- 1 in 10 of UK doctoral graduates in full-time work were employed outside the UK
- Around half of international doctoral graduates in full-time work remained in the UK
- Somewhat more of the international doctoral graduates continued to study





Circumstances by discipline

- Higher proportions of STEM doctoral graduates entered full time work than HASS disciplines
- Part-time working was most common for arts and humanities doctoral graduates (26%) and social sciences (16%)
- Other activities and unemployment were noticeably higher amongst arts and humanities doctoral graduates
- 3% of arts and humanities doctoral graduates were retired from work; higher than any other discipline



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Occupational clusters

- The table shows occupational clusters of all those in some kind of employment or self-employment, by domicile
- Just under half of doctoral graduates were in a job in HE at this point
- The proportion in research jobs outside HE (10%) was slightly lower than in previous WDRD analyses using 3.5 year DLHE data (13-15%)
- Higher proportions of the RoW domiciles entered HE jobs, than amongst UK or EU graduates
- More of those who worked outside the UK were in HE and/or research jobs, than those who stayed in the UK



		Workin	g in UK	Working outside UK		
	All	UK	UK EU		All	
HE research	26.7%	23.1%	33.7 %	37.1%	19.4 %	
HE teaching/ lecturing	17.6 %	17.2 %	15.6 %	21.0 %	30.5%	
HE other	4.2 %	4.3 %	4.0 %	3.5 %	2.8 %	
Research outside HE	10.2 %	10.3 %	13.6 %	7.6 %	16.0 %	
Other teaching	3.0 %	3.4 %	1.5 %	2.2 %	3.4 %	
Other common doctoral occupations	27.3 %	29.6 %	23.6%	19.4%	19.0 %	
Other	11.0 %	12.0 %	8.0 %	9.2 %	8.9 %	
N	9265	6700	995	1575	3215	

* Rest of World (RoW)

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Occupational clusters by discipline

- The proportions of doctoral graduates working in different occupational clusters varied strongly by discipline
- Higher proportions of HASS doctoral graduates worked in HE than those from STEM disciplines
- 50% of social sciences doctoral graduates were employed in HE teaching
- HE research roles are far more common in STEM subjects
- The proportions of doctoral graduates in research jobs outside HE were higher in STEM fields, especially biological sciences
- High proportions of biomedical sciences and physical sciences & engineering doctoral graduates were employed in Other common doctoral occupations, e.g. in health and engineering roles
- 24% of arts and humanities doctoral graduates were employed in 'Other' occupations



	Biol sci	Biomed	Phys sci 8 eng	Social sci	Arts & hums
HE research	37.2 %	24.3 %	32.8 %	18.5 %	16.6 %
HE teaching/ lecturing	9.4%	10.1%	7.9 %	50.2 %	28.4%
HE other	2.7 %	5.1%	2.4 %	3.3 %	9.0 %
Research outside HE	19.7 %	9.7%	12.8 %	3.3 %	3.8 %
Other teaching	2.7 %	0.8%	2.0 %	2.1%	8.1%
Other common doctoral occupations	14.8 %	43.6 %	31.8 %	14.0 %	10.0 %
Other	13.9 %	6.4 %	10.4 %	8.6 %	24.4%
N	1115	2430	3175	1215	1055

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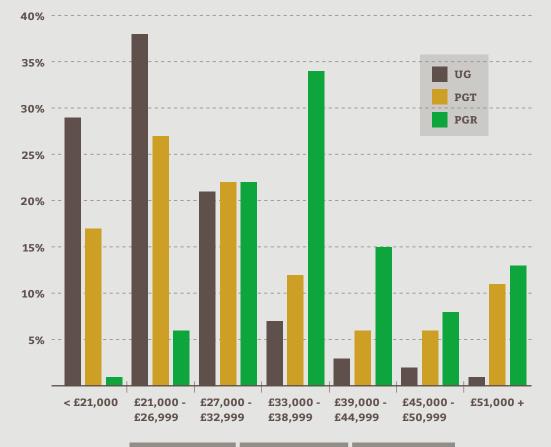
Earnings

- Most doctoral graduates (PGR) earned more than first-degree graduates (UG) and taught postgraduates (PGT)
- Median earnings for doctoral graduates were £36k
- LEO data revealed PGR median earnings of £33.2k 1 year after graduation, higher than for firstdegree or PGT graduates
- LEO median doctoral graduate earnings after 1 year were higher than UG 5 years after graduation or PGT after 3 years

Footnote: Graduate Outcomes data are for all domiciles in full-time work in the UK;
LEO data include part-time workers

All 2018/19 doctoral graduates in full-time work in the UK (N=6660)





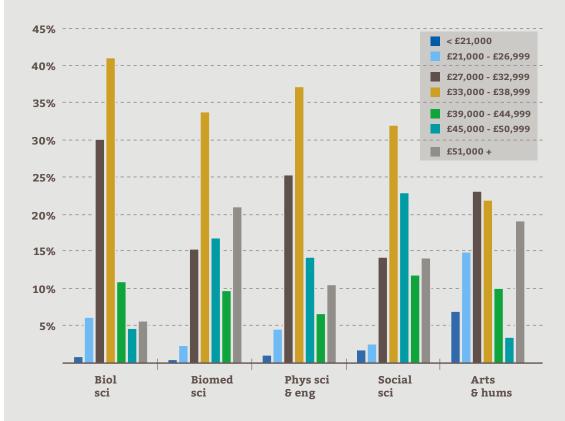
Degree level	Survey point	Median salary (LEO)
UG	1 year 5 years	£ 20,800 £ 27,400
PGT	1 year 3 years	£ 27,400 £ 30,300
PGR	1 year	£ 33,200

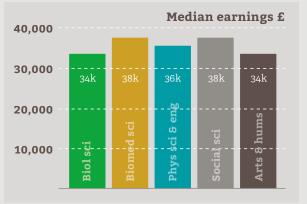
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Earnings by discipline

- Median earnings were highest for biomedical sciences and social sciences doctoral graduates (£38k), lowest (£34k) for biological sciences and arts and humanities
- Earnings in STEM disciplines were more tightly clustered than in social sciences or especially arts and humanities
- Arts and humanities had the highest proportion of low earners, but also the second highest proportion of those earning over £51k
- Caution: These differences should not be considered in isolation - the next slide shows how earnings were strongly driven by occupational profile



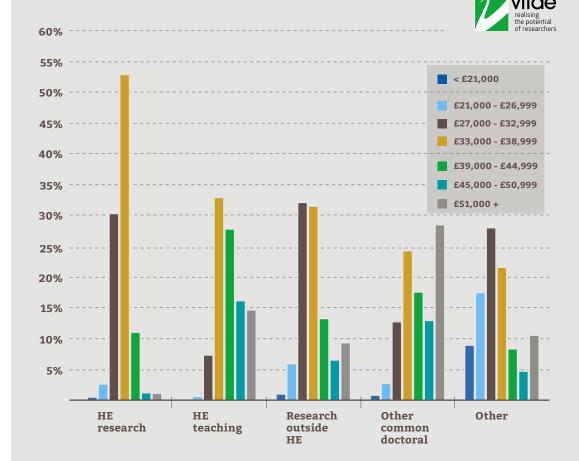


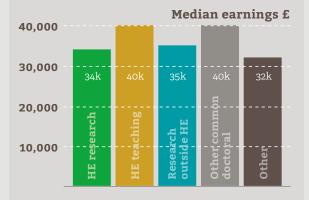


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Earnings by occupational cluster

- Earnings profiles varied strongly with occupational cluster
- HE research roles tightly ranged around a median of £34k; roles in research outside HE had a wider range around slightly higher median of £35k
- Other common doctoral occupations had a higher median (£40k) and more high earners
- Roles in HE teaching had a high median (£40k) with many that earned more: Analysis of earnings with age suggested this is driven by mid-career academics undertaking doctorates



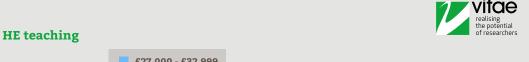


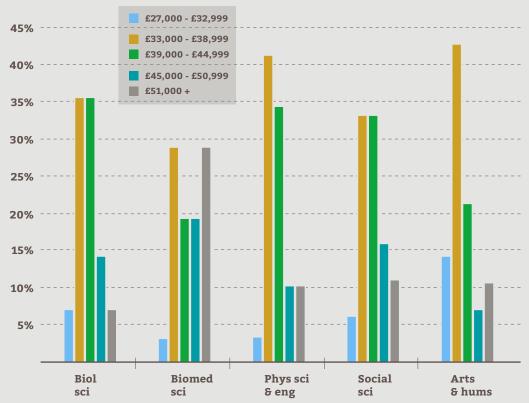
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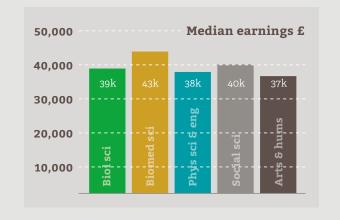
Earnings by discipline within an occupational cluster

- Within a single occupational cluster, such as HE in teaching, median earnings by discipline varied in a broadly similar profile to overall, being highest in biomedical and social sciences, which could reflect that doctoral study is more common in later career stages in these disciplinary areas
- Analysis by band showed the high median for biomedical sciences results from a high proportion of high earners, whereas this was not seen for social sciences
- There was some evidence of lower earnings for arts and humanities graduates, despite a relatively high age profile

Footnote: 2018/19 doctoral graduates in full-time work in UK within HE teaching cluster (N=1020)





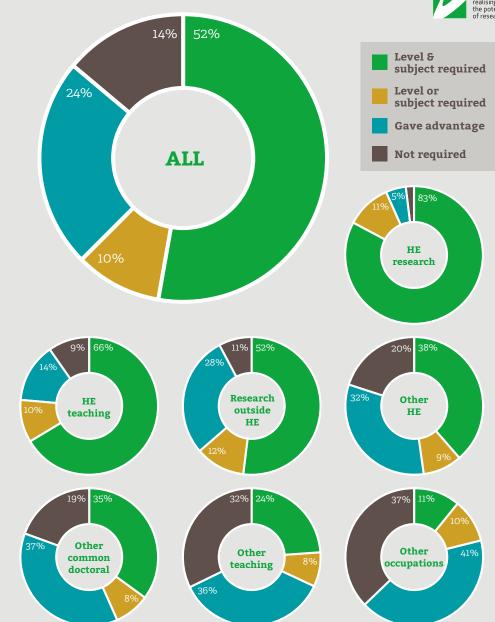


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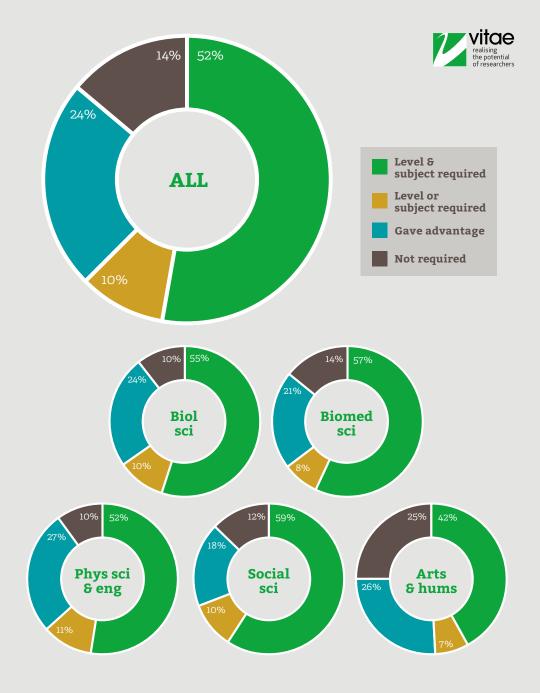
Value of the doctorate to job

- Across all occupations, a doctorate was required for 62% of employed doctoral graduates (52% both its level and subject, 10% either)
- Only 14% said doctorate was not required or advantageous
- These perceptions predictably vary strongly with cluster:
 - More than 90% employed in HE and/or research believed it had been required or advantageous in securing their job
 - 80% in Other common doctoral occupations believed a doctorate was required or advantageous



Doctorate value by discipline

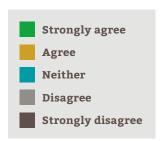
- The extent to which the doctorate was required or advantageous in obtaining current job did not vary hugely by discipline
- That said, the variations shown reflect to some extent the occupational profiles of doctoral graduates from different disciplines
- The higher proportion of 'other' occupations amongst arts and humanities graduates was reflected in a lower proportion reporting the doctorate as essential for their job
- Three quarters or more in any subject group, and 9 out of 10 in some, felt that their doctorate had been advantageous in securing their current job



viide realising the potential of researchers

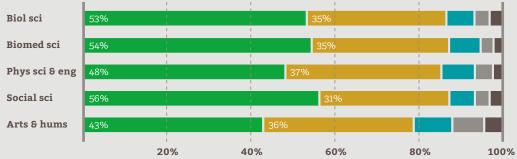
Career context by discipline

- High proportions of doctoral graduates felt positive about their work: agreeing that it used their skills or knowledge, was meaningful and fitted their overall career plans
- Around 90% in any disciplinary area felt their current work was meaningful
- Somewhat lower proportions
 (but still around 80%) of arts and
 humanities graduates said they
 used their doctoral skills and that
 their job fitted their career plan,
 potentially reflecting the higher
 proportion of them in the 'other'
 occupational cluster

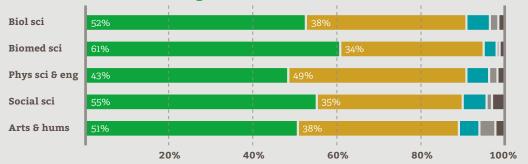


Footnote: 2018/19 doctoral graduates in employment (N=8750)

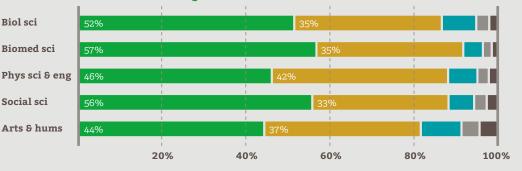




Work is meaningful



Fits with future plans



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Job activities and use of skills

- 70% of all UK domiciled employed doctoral graduates used research skills in their role
- Over 60% either conducted or interpreted/evaluated research
- Over 80% worked autonomously and only 11% under close supervision most or all of the time
- Over half said they work as part of a team all or most of the time; only 10% said they hardly ever or never do



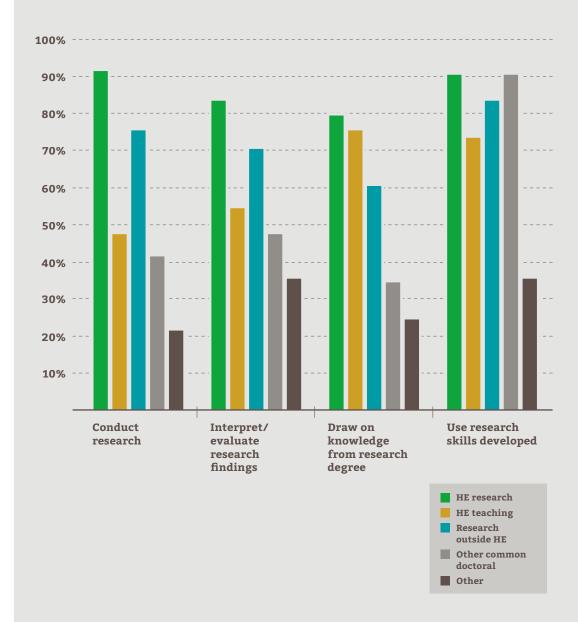
	All the time	Most of the time	Occasionally	Hardly ever	Never
Conduct research	32.6%	25.5 %	19.5 %	8.3 %	13.6%
Interpret/evaluate research findings	29.9 %	30.2 %	24.0 %	5.7 %	9.5 %
Draw on knowledge from research degree	26.2 %	27.9 %	20.5%	9.8%	15.0 %
Use research skills developed	39.7%	30.1%	19.9%	5.3 %	4.5%
Work autonomously	33.6 %	48.2 %	14.2 %	1.2 %	1.9 %
Work as part of a team	20.0 %	32.3 %	36.9 %	7.7 %	2.7 %
Work under close supervision	2.4 %	8.9 %	30.6%	37.8 %	19.8%

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Job activities and use of skills, by cluster

- Predictably, some of the results differed markedly by occupational cluster, such as the proportion who conducted research - over 90% of those in HE research jobs but 20% in 'other' occupations
- By contrast, the proportions who used their research skills were high in every cluster except for 'other'
- 90% in common doctoral occupations used their research skills or worked with research findings most of the time
- Some proportion of doctoral graduates had used their doctoral experiences all or most of the time in all occupational clusters





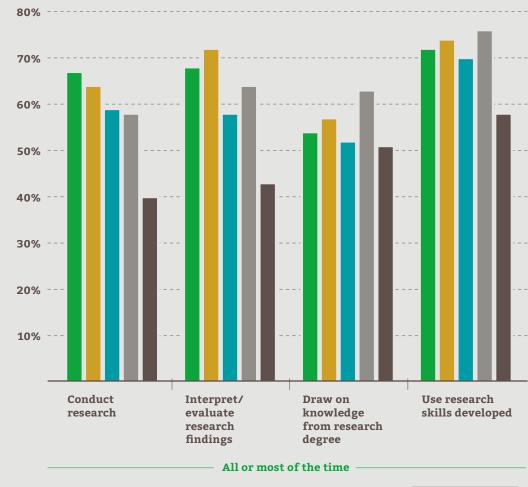
Footnote: 2018/19 doctoral graduates in employment doing certain activities all or most of the time (N=2115, optional question bank)

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Job activities and use of skills, by discipline

- The chart shows the proportions of doctoral graduates by discipline who undertook these activities related to their research, all or most of the time in their current job
- Over two thirds from most subjects said they used research skills from their doctorate or interpreted/evaluated research findings frequently
- The proportions conducting research were somewhat lower, but still over half in all areas except arts and humanities
- There was relatively little variation by discipline, other than for the arts and humanities
- The lower proportions of arts and humanities graduates doing research or using research skills reflected the higher proportion of these graduates in the 'other occupations' cluster







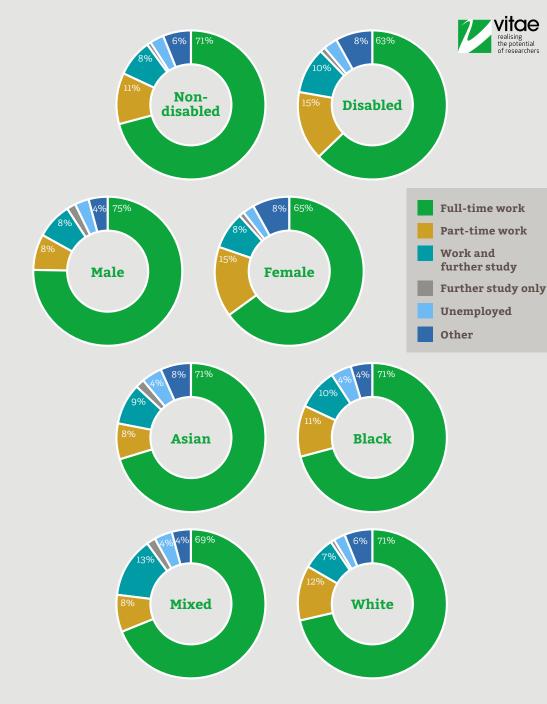
Footnote: 2018/19 doctoral graduates in employment doing certain activities all or most of the time (N=2115, optional question bank)



How outcomes varied with different personal characteristics

UK-domiciled doctoral graduate outcomes by gender, disability and ethnicity

- Unemployment was higher amongst ethnic minorities (4%) - double the rate amongst white doctoral graduates (2%)
- Proportion in full-time work was consistent across main ethnicity groups and lower for females and disabled doctoral graduates
- Proportions of females and disabled graduates in part-time work (>15%) were double those amongst males or non-disabled doctoral graduates
- More females and disabled doctoral graduates were doing 'other' things, especially caring
- Somewhat more Black doctoral graduates were in part-time roles compared to other ethnicities; none were in further study



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Occupational clusters by gender, disability and ethnicity

- There were very few differences in the destinations in terms of occupational cluster for males and females, or disabled doctoral graduates
- There was some evidence that a slightly higher proportion of white graduates entered HE jobs than of ethnic minority graduates when viewed together, while more of the latter entered other common doctoral occupations
- Within narrower ethnic groups, differences emerged, such as a low proportion of Black graduates in HE research roles (but a high proportion in HE teaching roles)
- Analysis that also took into account disciplinary group suggested few differences other than fewer ethnic minority doctoral graduates than white going into HE occupations within the biomedical (27% vs 40%) and biological sciences (33% vs 48%)

	Female	Male	Disabled	Non- disabled
HE research	22.7 %	23.2 %	20.3 %	23.3 %
HE teaching	17.8 %	16.5 %	20.3 %	16.8 %
HE other	5.1 %	3.5 %	4.2 %	4.3 %
Research outside HE	9.6 %	11.0 %	9.8 %	10.4 %
Other teaching	4.1 %	2.8 %	2.8 %	3.4 %
Other common doctoral occs	27.7 %	31.7 %	27.3 %	30.0%
Other occupations	12.5 %	11.0 %	14.0 %	11.6 %

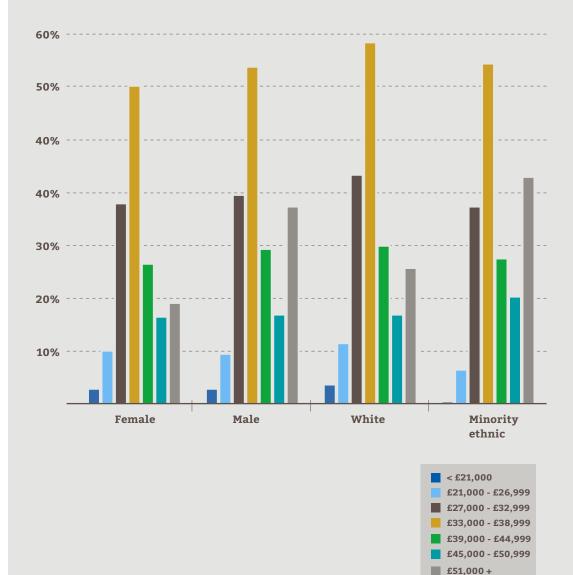
	White	Minority ethnic	Asian	Black	Mixed
HE research	24.0 %	20.0 %	19.3 %	9.4 %	28.9 %
HE teaching	17.2 %	17.7 %	13.6 %	28.1%	15.8 %
HE other	4.8 %	2.9 %	2.3 %	3.1%	2.6 %
Research outside HE	10.1%	13.1 %	15.9 %	12.5 %	7.9 %
Other teaching	3.6 %	2.9 %	2.3 %	6.3 %	2.6 %
Other common doctoral occs	27.4 %	34.3 %	37.5 %	31.3 %	31.6 %
Other occupations	12.6 %	9.1%	8.0 %	12.5 %	10.5 %

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Earnings by gender or ethnicity

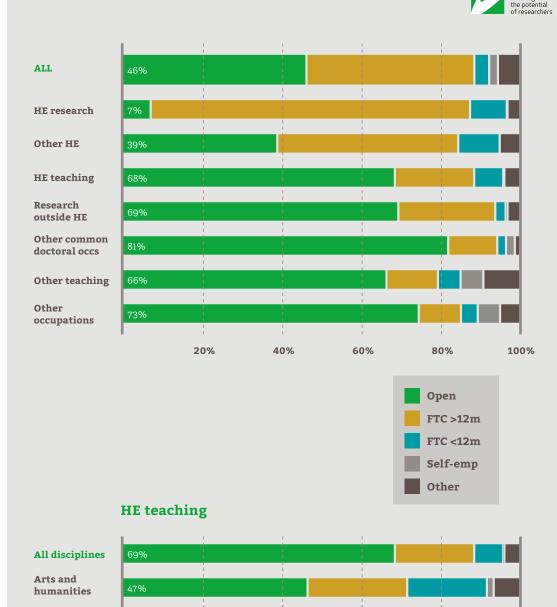
- Median rounded earnings were similar for males and females (£36k)
- Salary band profiles for males and females were similar, except more males earn over £51k
- Median earnings for ethnic minorities (£38k) were higher than white doctoral graduates (£36k)
- The salary profile for ethnic minorities (14% of the total) was distinct in having fewer low earners and more high earners, hence the elevated median





Contract type

- Those working in HE research roles stood out due to the high proportion with a fixed term contract (FTC)
- A similar high proportion on FTC occurred for those working in such roles outside the UK (not shown here)
- In all other major clusters, most had an open-ended contract
- The 'Other HE' cluster also had a fairly high proportion on FTC, compared to non-HE clusters
- The only clusters in which there was significant self-employment or casual arrangements were teaching outside HE (which is likely to include freelance tutoring) and 'other occupations'
- By discipline, the most prominent variance was a lower proportion of arts and humanities graduates in HE teaching having an open-ended contract (47%) and high proportion FTC (45%) - noting that this is the largest occupational cluster for that discipline
- Analysis by gender or ethnicity did not reveal any substantive variances within the main clusters



40%

60%

80%

100%

20%

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Focus on HE careers

Earnings by gender or ethnicity

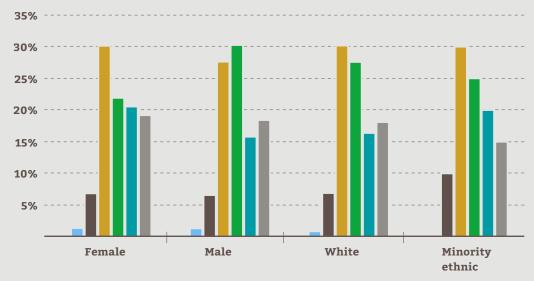
- Within HE research and HE teaching there were few differences in earnings by gender or ethnicity
- Median earnings were similar for gender and ethnicity for both HE research (£34k) and HE teaching (£41k)
- In HE teaching, more males were earning in £39-£45k band than females
- In HE research, a slightly higher percentage of ethnic minority graduates earned in the highest bands (than white), whereas there were more white graduates in the £27-£33k band



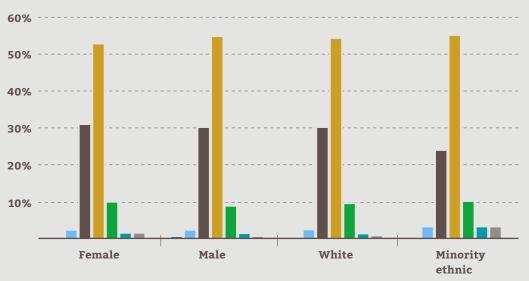
Footnote: UK-domiciled 2018/19 doctoral graduates in full-time employment in the UK (Ns= 735 HE teaching; 1215 HE research)







HE research





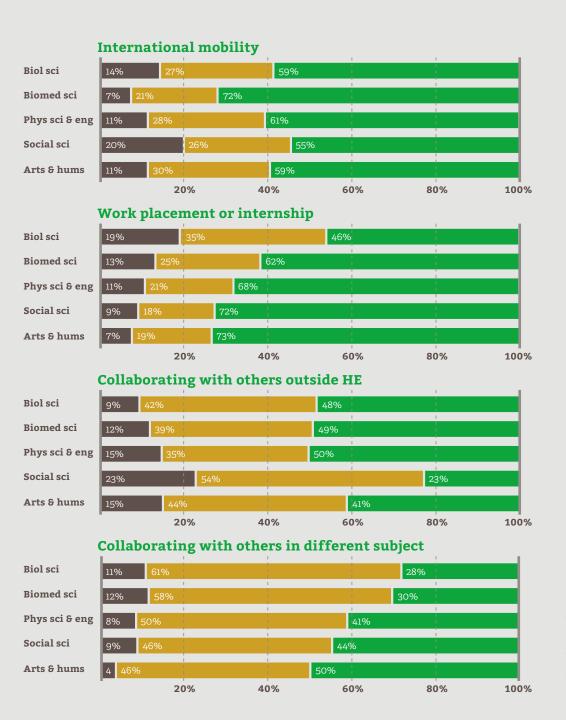
Doctoral study experiences and activities

Activities during doctorate

- Biomedical sciences were least likely to have had international mobility
- Biological sciences were most likely to have had a placement or internship
- Social sciences were most likely to have collaborated with others outside HE
- Arts and humanities were least likely to have had interdisciplinary collaborations



Footnote: All 2018/19 doctoral graduates (N=2875, optional question bank)





Personal characteristics of the doctoral graduates as students

Study profile of doctoral graduates

- Just over half of doctoral graduates were of UK domicile, although this varied strongly by disciplinary group (highest in biomedical sciences and lowest in social sciences)
- The proportion of graduates who were Research Council-funded varied with discipline (and were the majority amongst only UKdomiciled physical sciences and engineering students)
- Over 45% of arts and humanities and social sciences doctoral graduates were entirely or mainly self-funded
- 15% of all doctoral graduates studied on a part-time basis, but this was 23% in the arts and humanities



	ALL	Biol sci	Biomed sci	Phys sci 8 eng	Social sci	Arts 8 hums
Population	27,645	2,960	5,900	9,775	4,145	3,935
DOMICILE						
UK	52.7 %	57.2 %	68.2 %	43.8 %	41.5 %	58.5 %
EU	14.3 %	15.1 %	10.6 %	17.0 %	15.1 %	13.6 %
Rest of world	33.0 %	27.8 %	21.2 %	39.2 %	43.4 %	27.9 %
FUNDING						
None (self-funded)	36.4%	29.0%	32.8%	21.4%	46.1%	46.0%
Research Council student	21.4 %	25.0 %	11.1 %	31.6 %	14.4 %	20.0 %
Research Council funded % of UK students	32.3%	37.8%	13.8%	55.7%	24.1%	29.6%
MODE						
Full-time	84.6 %	92.1 %	80.7 %	93.0 %	80.6%	77.4 %
Part-time	15.4 %	7.9 %	19.3 %	7.0 %	19.4 %	22.6 %

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Personal profile of doctoral graduates

- While half of UK-domiciled doctoral graduates, overall, were female, this varied strongly by disciplinary group (65% in biomedical sciences; only 30% in physical sciences and engineering)
- Age profiles differed strongly with discipline: half of social science graduates were over 30 when they started doctoral study, but only 16% in STEM disciplines
- Doctoral graduates of ethnic minority background remained the minority - 20% of those in social science but under 10% of those in the arts and humanities



	ALL	Biol sci	Biomed sci	Phys sci 8 eng	Social	Arts 8 hums
Population	27,645	2,960	5,900	9,775	4,145	3,935
SEX						
Female	50.2 %	49.3 %	65.0 %	30.4 %	52.9 %	55.4 %
Male	49.7 %	50.4 %	35.0 %	69.6 %	47.1 %	44.6 %
AGE*						
30 +	33.9 %	16.2 %	40.0 %	16.4 %	52.3 %	43.3 %
25 - 29	23.4 %	20.4 %	30.0 %	18.2 %	25.6 %	25.2 %
< 25	42.7 %	63.4 %	30.0 %	65.4 %	22.4 %	31.7 %
ETHNICITY						
White	84.5 %	87.9 %	81.2 %	84.6 %	79.9 %	90.4 %
Minority ethnic	15.5 %	12.1 %	18.8 %	15.4 %	20.1%	9.6 %
- Asian	7.5 %	5.4 %	11.0 %	7.8 %	7.9 %	3.2 %
- Black	2.7 %	1.9 %	2.1 %	2.5 %	6.3 %	1.2 %
- Mixed	3.3 %	3.2 %	3.4 %	3.1 %	3.6 %	3.4 %
- Other	2.0 %	1.3 %	2.3 %	2.0 %	2.3 %	2.0 %
DISABILITY						
Known disability	10.5 %	10.3 %	9.0 %	10.2 %	13.1 %	12.8 %

^{*} Age is at start of doctoral study

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