



Higher Education Policy Institute

PhD students and their careers

Bethan Cornell

Intern at HEPI and PhD student at King's College London

HEPI Policy Note 25

July 2020

Key findings

- Most PhD students (88%) believe their doctorate will positively impact their career prospects.
- PhD students are almost equally more (33%) and less (32%) likely to pursue a research career after they started their PhD than before, with the majority stating academic (67%) research or research within industry (64%) as a probable career path.
- The most commonly given reason for PhD students wanting to stay in academia is greater interest in their subject of study (40%).
- Reasons for wanting to leave academia vary – the most commonly cited reason is a lack of work-life balance (20%).
- PhD students are more confident their degree is preparing them for an academic research career (81%) than one straddling both academia and industry (47%), or a non-research career (33%).
- They feel well trained in analytical (83%), data (82%) and technical (71%) skills, along with presenting to specialist audiences (81%) and writing for peer-reviewed journals (64%).
- They are less confident of their training in managing people (26%), finding career satisfaction (26%), applying for funding (22%) and managing budgets (11%).
- When considering future careers, PhD students are more likely to do their own research (64%) or attend careers workshops (76%) and networking events (60%) than to discuss options with an institutional careers consultant (13%).

Methodology

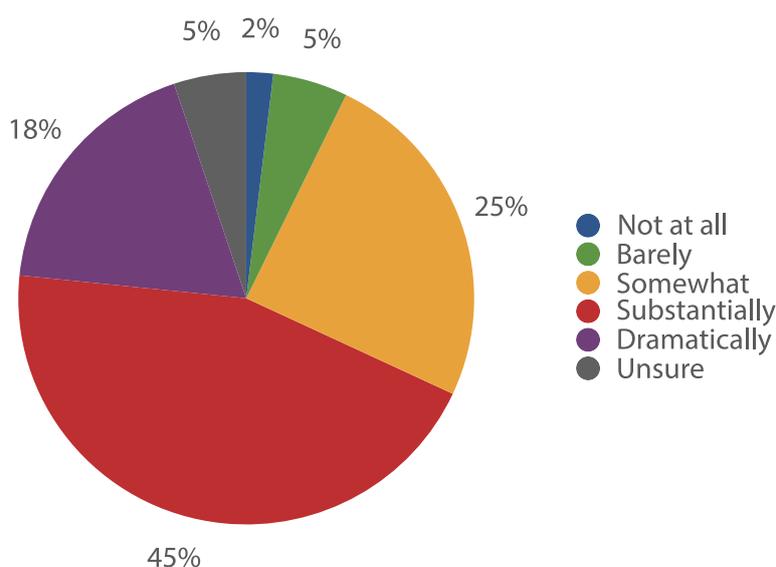
Nature surveyed 6,320 current PhD students worldwide for six weeks between June and July 2019. The confidence interval was 95% with a 5% margin of error. Respondents providing incomplete or poor quality answers were removed from the final sample. We extracted the information of the 526 PhD students studying in the UK. No information was available on the subjects studied, but, given that *Nature* is a scientific journal, these results are likely to be more representative of PhD students in the Sciences than those in other disciplines. The data is freely available from *Nature*.¹ The data are rounded so percentages may not always sum to 100%.

Introduction

In this Policy Note, we use newly extracted data from the *2019 Nature PhD Students Survey* to analyse how well-prepared PhD students feel for their future careers. From this, we assess to what extent any negative working cultures, including long hours and high rates of bullying and harassment, influence PhD students' continuation in academia.²

Do students believe their PhD influences future career prospects?

Figure 1 - How much will a PhD improve your career prospects?



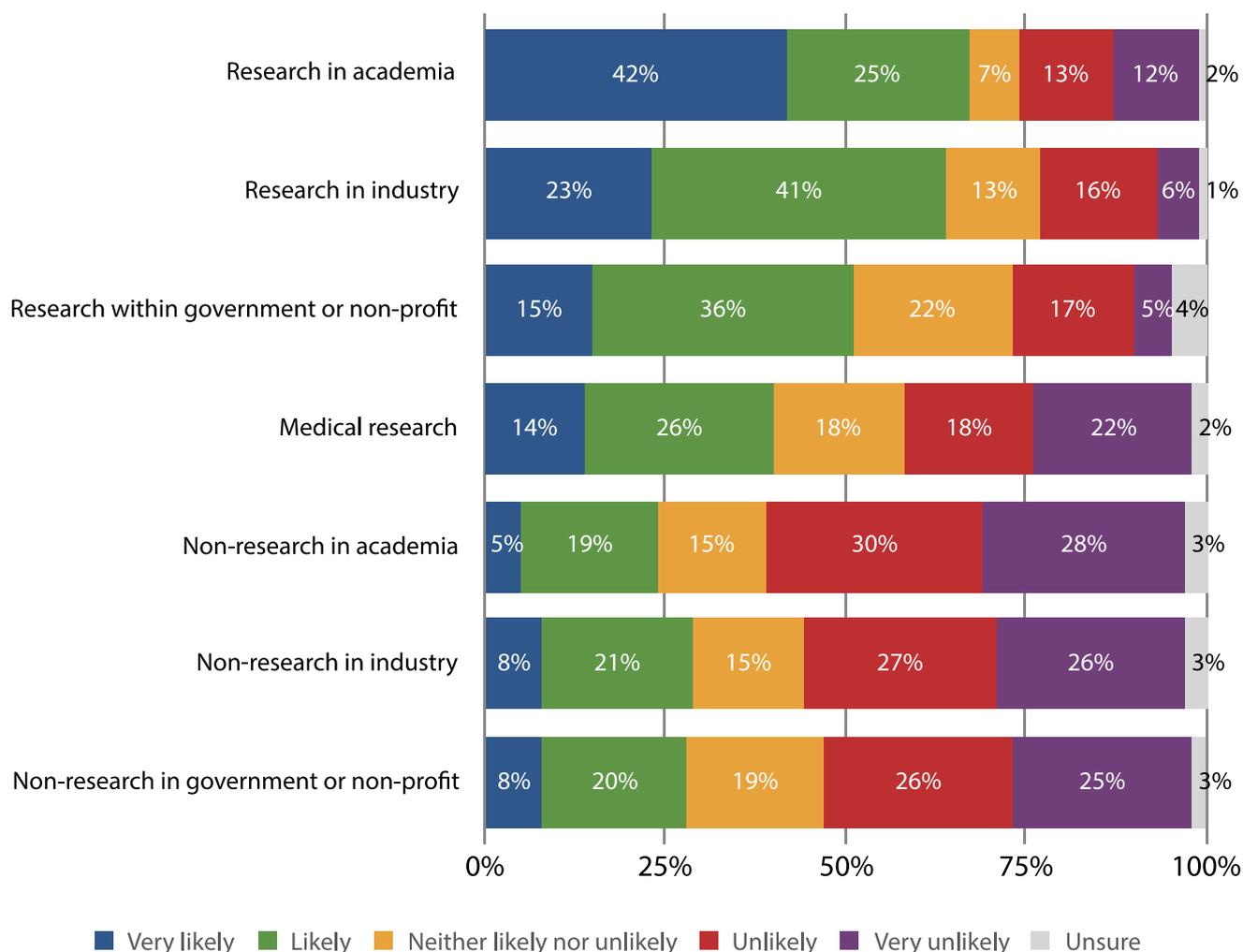
Base: The 439 / 526 respondents who indicated they may leave academic research after their PhD

Most PhD students are confident their degree will improve their employability. Nearly two-thirds (63%) believe a PhD will either substantially or dramatically improve their career prospects and one-quarter (25%) think it will somewhat improve them. Only 7% believe their PhD will not improve their career prospects, while 5% are unsure.

It is likely these students have accurate expectations because doctoral graduates earn more than both undergraduates and other postgraduate students. According to HESA's 2017/18 *Graduate Outcome* data, fifteen months after graduation 31% of PhD graduates earned £39,000 or more, compared to 20% of taught Master's graduates and 6% of undergraduates.³

What career path will PhD students take after graduation?

Figure 2 - How likely are you to pursue each of the following career paths?

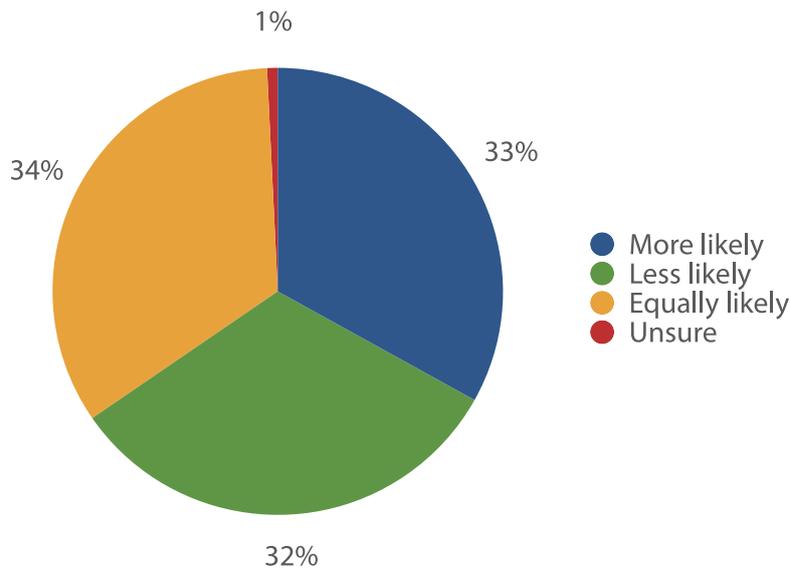


PhD students believe they are most likely to pursue a career in academic research, with over two-thirds (67%) giving this as their most probable pathway. However, they also see research in industry (64%) and other sectors (51%) as likely outcomes. Despite PhD students' clear preference for academic research, a recent study of HESA's *Destination of Leavers from Higher Education (DLHE)* longitudinal data found that three-and-a-half years after graduation, 70% of PhD students had left academia. Of these, only half were still working in research.⁴ There is a clear difference between current PhD students' career ambitions and outcomes.

Many respondents seem to be open about the career path they will choose by indicating that research in industry or academia and leaving research are all likely outcomes. This may be because, by its nature, an academic career is uncertain, with fewer permanent academic posts available than applicants.⁵ Small proportions state they are uncertain about each career path, which implies that, while PhD students are open to a number of different outcomes, they are sure as to which careers they will and will not consider.

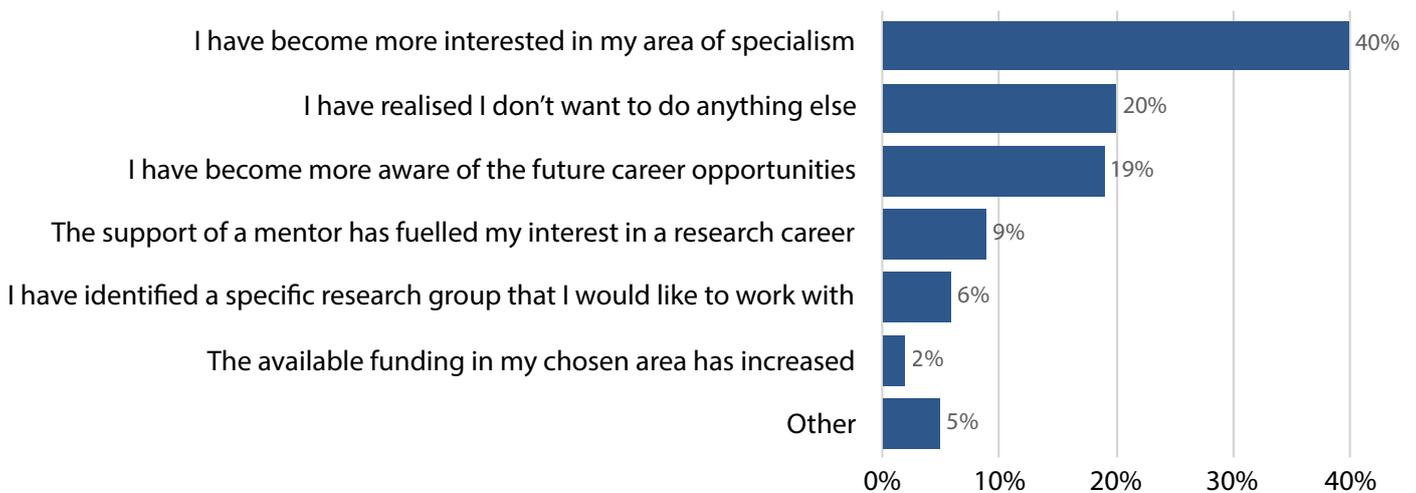
If PhD students leave research, a greater proportion (29%) wish to do so for a role in industry than one in higher education. Only 24% believe that a non-research career in academia is a likely outcome for them.

Figure 3 - How much more likely are you to pursue a research career now than when you launched your PhD programme?



Similar proportions of PhD students believe they are more (33%), less (32%) and equally (34%) likely to remain in research now compared to the start of their degree. This implies the PhD experience has no net effect on progression rates of PhD students into research.

Figure 4 - Why are you likely to stay in academic research?



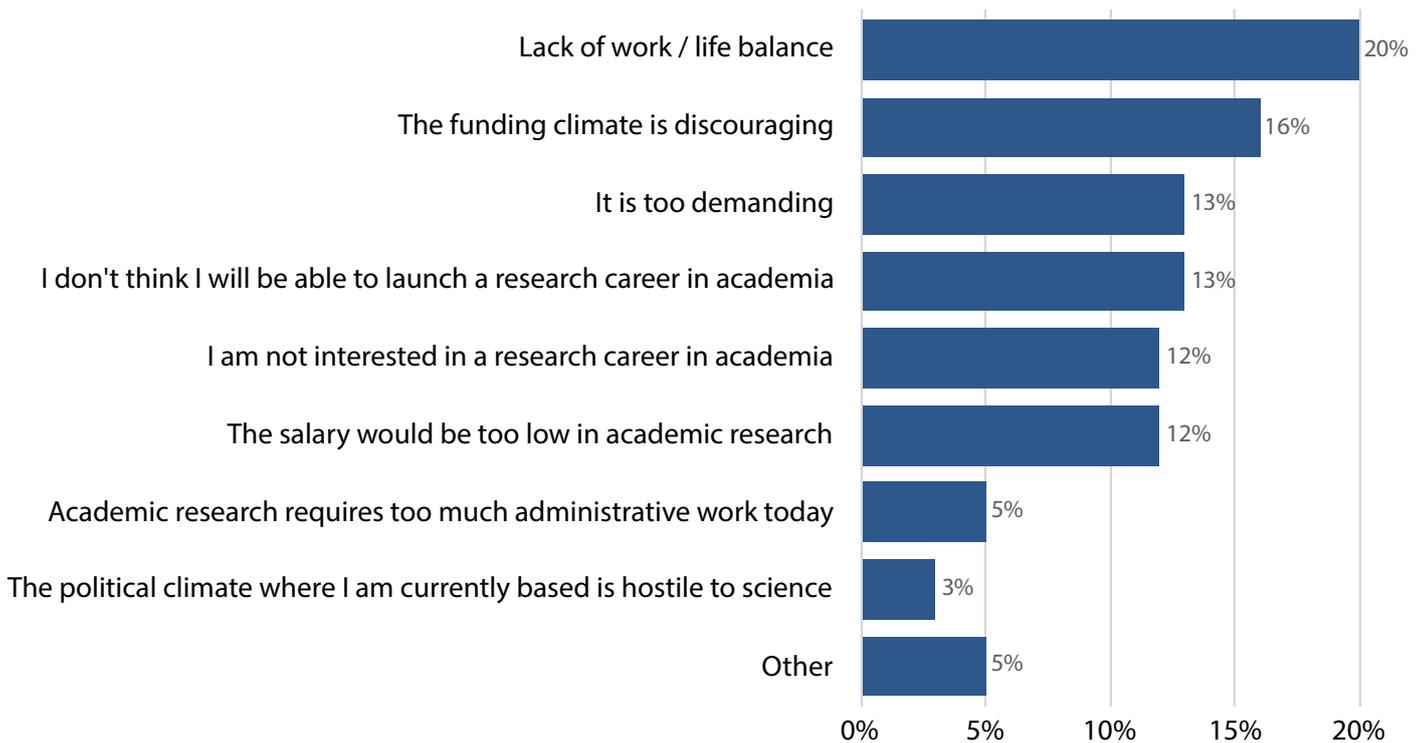
Base: The 174 / 526 respondents who indicated they are more likely to remain in academic research now, compared to before their PhD

The most commonly cited (40%) reason for PhD students wishing to remain within academic research is increased interested in their specialism. One-fifth (20%) say they do not wish to do anything else and 19% say they are more aware of the opportunities available to them. Very few (2%) wish to remain in academia due to increases in funding, which may be because funding is seen by PhD students as one of the biggest barriers to achieving a successful academic career.⁶ Some of the students in the survey who indicate they are likely to remain in academic research include reasons such as:

I enjoy research!

I don't feel qualified or prepared to enter a career outside of research.

Figure 5 - What are the main reasons you are unlikely to pursue an academic research career?



Base: The 439 / 526 respondents who indicated they may leave academic research after their PhD

PhD students wishing to leave academic research do so for a number of reasons. Most often cited is the lack of a work-life balance (20%). In *PhD life: The UK student experience*, we found a strong dissatisfaction with work-life balance among PhD students, with the majority working unhealthy hours (the average PhD student works 47 hours per week).⁷ It seems this long working hours culture may drive some PhD students away from academic research. A discouraging funding climate (16%) is also seen as a reason for leaving research. This finding may be especially relevant post Covid-19, when funding opportunities are likely to be reduced as universities tighten spending.

Some PhD students (13%) lack the self-confidence or willingness to pursue a demanding academic research career, while a similar proportion (12%) are not interested or seek a higher salary. Few PhD students (5%) are unwilling to remain in academia because of extra administrative work. Some students in the survey who say they may leave academic research give their reasons as:

Lack of job security / long term permanent contracts.

The requirement to move around in pursuit of short-term postdocs is terrible for social and family life.

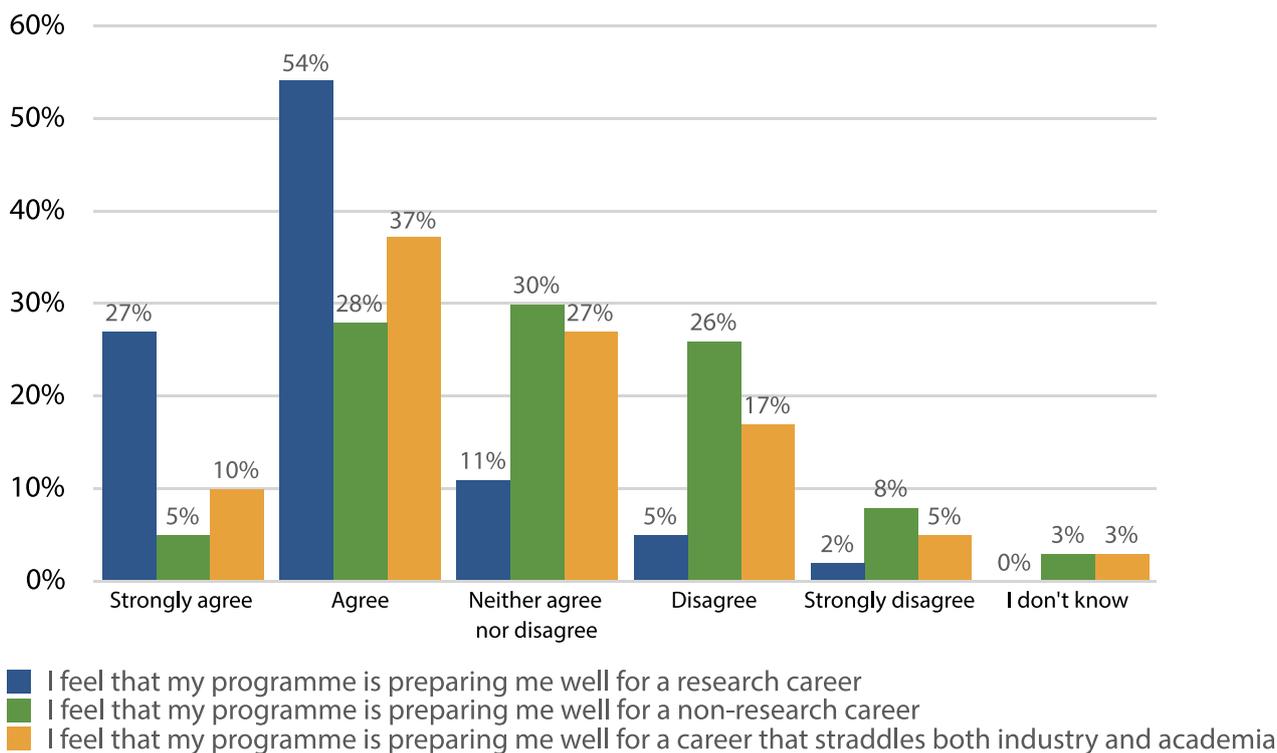
The academic culture will be detrimental to my mental health.

Too many games to play to be successful.

I can't deal with potentially working with people like my PIs [Principal Investigators] again. That combined with a poor work-life balance and no job security makes running away from academia a no brainer.

How well are PhD students prepared for their future careers?

Figure 6 - Is your programme preparing you well for a research / non-research career?

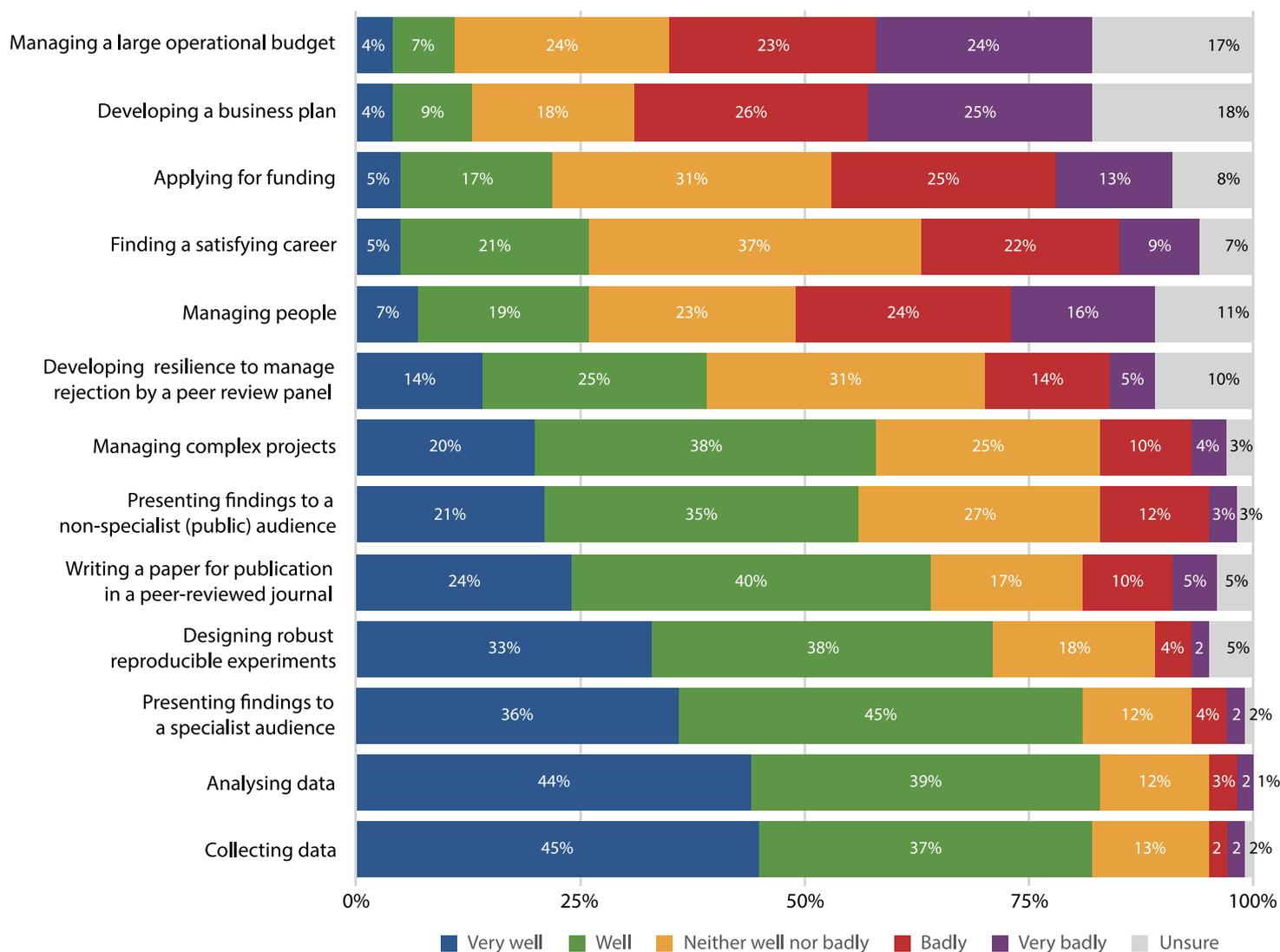


PhD students are confident their programme is preparing them well for a research career, with 81% agreeing or strongly agreeing. Nearly half (47%) agree their programme is preparing them well for a career straddling both academia and industry, while fewer (33%) are confident they are being well-prepared for a non-research career.⁸ Although HESA's *Destination of Leavers from Higher Education* and *Graduate Outcomes* surveys include some publicly available information on doctoral students, the breakdown of employment sector and subject studied in each is not sufficient to ascertain whether PhD students go on to pursue academic research or not.⁹ However, the *Graduate Outcomes* data tell us that fifteen months after graduation, only 57% of postgraduate research students were on a permanent contract.¹⁰ Almost all academic research careers require time on a fixed-term postdoctoral contract after a PhD, therefore, it would not be unreasonable to assume that this 57% were mostly made up of students who did not go into academic research.

Over half of students believe their PhD is preparing them well for technical skills including:

- analysing data (83%);
- collecting data (82%);
- presenting findings to a specialist audience (81%);
- designing robust, reproducible experiments (71%);
- writing for publication in a peer-reviewed journal (64%);
- managing complex projects (58%); and
- presenting findings to a non-specialist (public) audience (56%).

Figure 7 - How well does your programme train you in...?



Many of these skills are transferable and valuable for a range of careers. Previous studies have found nearly two-thirds of Science, Technology, Engineering and Mathematics (STEM) PhD students are motivated by the transferable skills they are likely to gain from their PhD. Therefore, it is encouraging to find PhD students in this survey, who are likely to be studying in STEM fields, feel well-trained in transferable skills.¹¹ Furthermore, research by Vitae shows only 40% of PhD graduates who started in academic research remained within it after three-and-a-half years.¹² With so many leaving the sector, it is important that PhD students graduate with transferable skills so they are equipped to successfully enter the labour market.

In our data, fewer than half of PhD students believe they are well-prepared for:

- developing resilience to manage rejection by a peer review panel (39%);
- managing people (26%);
- finding a satisfying career (26%);
- applying for funding (22%);
- developing a business plan (13%); and
- managing a large operational budget (11%).

These skills are not only valuable in most sectors, but are especially needed for a successful academic career. For example, academic staff must often apply for funding to do their research. Securing a permanent position generally requires the ability to secure large research grants and, as mentioned previously, funding is perceived as one of the biggest barriers to the academic career progression of PhD students. Furthermore, there is a growing recognition that many academic staff do not receive adequate training in the management and leadership of PhD students.¹³ This can have a negative impact on the experience of PhD students and has also been shown to negatively impact the wellbeing of staff, who are under-supported to meet the competing demands of their jobs, which causes stress.¹⁴ While a PhD may prepare students for the technical aspects of research, these data suggest it often does not provide students with the additional skills that a successful academic career requires.

What do PhD students do to advance their careers?

Figure 8 – What have you done to advance your career?



PhD students most commonly seek to advance their careers by attending career workshops or seminars, with over three-quarters (76%) doing so during their course. Networking events, for example those generally included as part of conferences and academic societies, are popular, with 60% of PhD students using them to advance their careers.

Over half of PhD students (59%) use social networks for career advancement, with the most popular being LinkedIn (73%) followed by Twitter (45%). Facebook, WeChat and Research Gate are also used.

Fewer than half of PhD students (44%) discuss careers with their supervisor and only one-quarter (27%) with other mentors. Just 13% have discussed their career with a specialist careers consultant at their institution. Few PhD students (17%) have formed a personalised career development plan.

It has previously been found that only 25% of PhD students believe supervisors provide useful careers advice and 8% of supervisors actually discourage PhD students from attending careers training events.¹⁵ Consequently, it is disappointing to see so few PhD students securing 1-1 help from supervisors, rather than specialist careers consultants, who may be better placed to assist them than supervisors.

Figure 9 - How did you arrive at your current career decision?



The majority of PhD students (64%) have arrived at their current career decisions via their own research. Three-in-ten (30%) have done so by observing their supervisor, although we do not know whether this encouraged or discouraged them to pursue the same career. One-quarter (25%) have decided on their future following advice from colleagues and one-fifth (21%) following advice from their supervisor.

Around one-sixth (17%) of PhD students have sought careers advice from those who have already obtained the job they are interested in. One-in-ten (11%) have sought advice from their family and a similar proportion (10%) are still undecided on their career pathway.

Conclusions

The majority of PhD students wish to remain in research after graduating, either within academia or industry. Overall, there is no change in the proportions wanting to remain in academia now compared to before the start of their PhD. Therefore, these data do not indicate that a perceived poor research culture encourages researchers to leave academia. PhD students are generally motivated by interest in their subject to continue in research.

Currently, HESA's *Graduate Outcomes* survey, while it includes PhD students, does not provide a detailed breakdown of their future employment sector relevant to an academic career pathway.¹⁶ The UK is lagging behind other research-intensive countries in this respect. For example, the US National Science Foundation's *Survey of Earned Doctorates* has been tracking the outcomes of PhD students since 1957. It includes detailed information on the profile, previous attainment and destination of PhD students.¹⁷ **Therefore, we recommend that HESA puts a greater emphasis on the destinations of PhD students in its publicly available *Graduate Outcomes* data. For example, adding sectors relevant to PhD graduates, such as academic research, into the options for research careers. This will help increase knowledge of the challenges faced by, and success stories of, graduated PhD students.**

PhD students believe their doctorate will improve their prospects and the majority feel well-prepared for a career in research. However, they seem unclear as to whether their PhD will help them find a career outside of research. While they are confident in the training they receive for technical skills, PhD students are less confident in the training they receive for other skills, such as applying for funding and managing people and budgets. This may impact on their ability to progress within academia and their employability if they leave it. **We recommend that, as part of the wider PhD training experience, PhD students are given advice on**

applying for funding and managing both people and budgets. Proper training in these skills would equip PhD students to tackle the future challenges they may face as they seek either permanent academic roles or leave the sector for elsewhere. This will be especially relevant to PhD students graduating into an uncertain jobs market caused by the Covid-19 pandemic.

Many PhD students actively engage with events and networking opportunities to advance their careers. PhD students are more likely to do their own research or consult their supervisor about careers than speaking to specialist consultants at their own institution. This is despite only 39% of PhD students believing supervisors provide them with advice on careers.¹⁸ **Therefore, we recommend that institutions improve access to specialist research careers consultants for PhD students.** Where institutions already offer access to specialist careers provision for researchers, access to this service should be improved. Those institutions that do not currently provide such a service should look to do so in the future. **Additionally, institutions should provide specific careers training to supervisors, so they are better placed to advise their students properly or direct them to those who can.**

Endnotes

- 1 Nature in Collaboration Shift Learning, 2019 *Nature PhD Students Survey Data*, <https://figshare.com/s/74a5ea79d76ad66a8af8>
- 2 Bethan Cornell, *PhD life: The UK student experience*, HEPI, 25 June 2020 <https://www.hepi.ac.uk/2020/06/25/phd-life-the-uk-student-experience/>
- 3 HESA, *Graduates' salaries in Graduate Outcomes data 2017/18*: <https://www.hesa.ac.uk/data-and-analysis/graduates/salaries>
- 4 Sally Hancock, *The employment of PhD graduates in the UK: what do we know?*, HEPI blog, 17 February 2020 <https://www.hepi.ac.uk/2020/02/17/the-employment-of-phd-graduates-in-the-uk-what-do-we-know/>
- 5 Bethan Cornell, *PhD life: The UK student experience*, HEPI, 25 June 2020, p.79 <https://www.hepi.ac.uk/2020/06/25/phd-life-the-uk-student-experience/>
- 6 Bethan Cornell, *PhD life: The UK student experience*, HEPI, 25 June 2020, p.23 <https://www.hepi.ac.uk/2020/06/25/phd-life-the-uk-student-experience/>
- 7 Bethan Cornell, *PhD life: The UK student experience*, HEPI, 25 June 2020, p.18 <https://www.hepi.ac.uk/2020/06/25/phd-life-the-uk-student-experience/>
- 8 Since *Nature* is a scientific journal, this question was specifically phrased to reflect the scientific background of respondents by stating: 'I feel my programme is preparing me well for a non-research Science-related career'
- 9 HESA, *Destination of Leavers from Higher Education*, <https://www.hesa.ac.uk/news/28-06-2018/sfr250-higher-education-leaver-statistics-subjects> and HESA, *Graduate activities and characteristics from Higher Education Graduate Outcomes Statistics: UK, 2017/18* <https://www.hesa.ac.uk/data-and-analysis/graduates/activities>
- 10 HESA, *Graduate activities and characteristics from Higher Education Graduate Outcomes Statistics: UK, 2017/18*, breakdown by contract type <https://www.hesa.ac.uk/data-and-analysis/graduates/activities>
- 11 Mark Bennett, *Understanding the Journey to Doctoral Education: Results from the 2019 Future PhD Student Survey*, FindAUniversity, 18 February 2020, Figure 12 <https://www.findauniversity.com/blog/5829/understanding-the-journey-to-doctoral-education-results-from-the-2019-future-phd-student-survey>
- 12 Vitae in Partnership with RCUK and CRAC, *What do Researchers do? Career paths of doctoral graduates 2011*, p. 6 <https://www.vitae.ac.uk/vitae-publications/reports/what-do-researchers-do-career-paths-vitae-2011.pdf/view>
- 13 Bethan Cornell, *PhD life: The UK student experience*, HEPI, 25 June 2020, Chapter 2 <https://www.hepi.ac.uk/2020/06/25/phd-life-the-uk-student-experience/> and Vitae, in partnership with Ghent University and the Institute for Employment Studies, *Exploring the wellbeing and mental health and associated support services for postgraduate researchers*, May 2018, pp.15 & 16 <https://re.ukri.org/documents/2018/mental-health-report/> and The Wellcome Trust in collaboration with Shift Learning, *What researchers think about the culture they work in*, 15 January 2020, p.22 https://wellcome.ac.uk/reports/what-researchers-think-about-research-culture?utm_source=twitter&utm_medium=o-wellcome&utm_campaign=reimagineresearch
- 14 The Wellcome Trust in collaboration with Shift Learning, *What researchers think about the culture they work in*, 15 January 2020, p.34 https://wellcome.ac.uk/reports/what-researchers-think-about-research-culture?utm_source=twitter&utm_medium=o-wellcome&utm_campaign=reimagineresearch and Liz Morrish, *Pressure vessels: The epidemic of poor mental health among higher education staff*, HEPI, 2019, p.44 <https://www.hepi.ac.uk/2019/05/23/pressure-vessels-the-epidemic-of-poor-mental-health-among-higher-education-staff/>
- 15 Bethan Cornell, *PhD life: The UK student experience*, HEPI, 25 June 2020, p.48 <https://www.hepi.ac.uk/2020/06/25/phd-life-the-uk-student-experience/>
- 16 HESA, *Graduate activities and characteristics from Higher Education Graduate Outcomes Statistics: UK, 2017/18* <https://www.hesa.ac.uk/data-and-analysis/graduates/activities>
- 17 National Science Foundation, *Survey of Earned Doctorates* <https://nces.nsf.gov/pubs/nsf20301/data-tables/#group6>
- 18 Bethan Cornell, *PhD life: The UK student experience*, HEPI, 25 June 2020, p.48 <https://www.hepi.ac.uk/2020/06/25/phd-life-the-uk-student-experience/>



hepi

Higher Education Policy Institute

99 Banbury Road, Oxford OX2 6JX

Tel: +44 (0) 1865 284450

admin@hepi.ac.uk

www.hepi.ac.uk