

Summary of Findings, Recommendations and Policy Brief A National Tracer Study of Doctoral Graduates in South Africa



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The imperative to grow the academic pipeline and specifically to increase the production of doctoral or PhD graduates in South Africa is a policy priority. Training doctoral students is a long and costly endeavour, and there are questions about the return on this investment from the public and funders of education. More data that might help to allay their concerns is needed, for example, about the career trajectories of doctoral graduates in the country. While there has been a steep increase in the number of doctoral graduates produced in South Africa, especially over the past 10 to 12 years, the capacity of the labour market to absorb the growing number has not been comprehensively assessed.

Tracer surveys are employed by many countries to generate policy-relevant information on the characteristics, opinions and career histories and trajectories of PhD graduates. Before this study, no large-scale, systemic national tracer study of PhD graduates had been carried out in the country. The study therefore set out to trace the mobility, career paths and other attributes of a representative sample of PhD students who graduated from South African universities between 2000 and 2018, across a range of sectors and disciplines. The study was funded by the Department of Science and Innovation (DSI), managed by the Water Research Commission, and executed by a project team from Stellenbosch University's DSI-National Research Foundation (NRF) Centre of Excellence in Scientometrics and Science, Technology and Innovation Policy.

Approach and results

The study generated a master list of 29 593 PhD graduates for the period of interest to form the target population for the survey. Valid contact details for 15 565 of them were acquired, after which they were sent invitations to participate in a web-based survey. A total of 6 452 graduates completed the survey, making the response rate 41,4%. An analysis of the attributes of this sample indicated that the survey respondents could be considered representative of the total population of doctoral students who graduated between 2000 and 2018. In addition, the team conducted 117 in-depth interviews with respondents to collect more nuanced information to add to the quantitative findings from the survey.

The study produced the following headline findings:

1. **61% of the respondents studied and completed their PhDs part-time while engaged in some form of employment.** The proportion of full-time to part-time students (60:40) remained nearly unchanged over the period, suggesting that it is a structural feature of the South African doctoral system. A further disaggregation reveals that students in STEM fields were more likely to study full-time, and therefore more likely to receive bursaries or scholarships.
2. **The most frequently mentioned source of funding for doctoral studies is self-financing (33%),** which includes taking out loans and financial support from family members or partners. Three times more white students (60%) reported that they were self-financed than black students. The second most cited source of funds was assistance from the respondent's university (30%). Bursaries or scholarships from South African national funding agencies were only the third most frequently cited source of financing for studies (22%).
3. **The vast majority of graduates were employable, with only 2% (on average) not finding employment within the first year of completing their doctorate.** Most have remained with the same employer since obtaining their doctorates. A substantial number of graduates (20%) accepted a postdoctoral fellowship on completion of their studies. It should be noted that the percentage of doctoral graduates who could not find employment within the first year after graduation increased to 3,9% for the most recent graduates (2015 to 2018).
4. **Nearly one in five (18%) of respondents could not find employment related to their field of expertise.** Graduates who received their doctorates in the past five years were more likely than those who received their degrees 15 or more years ago to indicate that their current job or position was not related to the field of expertise of their doctorate.
5. **Nearly two-thirds (68%) of respondents were employed in the higher education sector at the time of the survey and have remained in the sector.** The final analysis shows a system with minimal mobility between sectors such as higher education, the public service and business.

6. **One in five (20%) of respondents accepted a postdoctoral fellowship upon completion of their studies.** Over the two decades, the number and proportion of PhD graduates doing postdoctoral research has grown significantly. The percentage of respondents who accepted a postdoctoral fellowship increased from 17% in the earlier years (2000 to 2009) to 22% in more recent years (2015-2018). It appears, however, that certain science, technology, engineering and mathematics (STEM) fields (biological and environmental sciences) may not have the capacity to absorb more postdoctoral researchers.
7. **One in three postdoctoral fellows** accept one or more postdoctoral positions after their first fellowship. This is an indication of the lack of employment opportunities for PhD graduates.
8. **South Africa has benefited significantly from the net inward flow of doctoral students.** Over the past 19 years, this translates to a net gain of 1 400 doctoral graduates, taking into account PhD graduates from other countries who remained in South Africa and South African nationals who left the country after graduation.
9. **Graduates rated the general knowledge and research skills acquired through their PhD as more useful in their current job** than field-specific knowledge, methodological skills or the specific research findings of their dissertations.
10. **More than two-thirds (70,5%) of respondents indicated that a doctorate was a requirement for employment in their current position.** More than four in five (83%) graduates currently employed in the higher education sector indicated that a PhD was a requirement for their work, compared to only 53% in the government sector, 39% in the non-profit sector and 33% in the business sector.
11. **Between 80% and 92% of respondents were satisfied with their decision to pursue a PhD,** that their doctorate had been in the right field, that it had turned out to be a good return on investment and that their expectations of obtaining a doctorate had been met.
12. **Just over half (54%) of respondents indicated that managerial responsibilities made up a large part of their current employment responsibilities.** This suggests that most graduates find themselves in positions where they must combine knowledge and research-related skills with managerial responsibilities. Being involved in management now seems to be an essential component of work, even for knowledge workers.

Policy implications and recommendations

The evidence around the employment of PhD graduates in their fields of expertise and the repeated acceptance of postdoctoral fellowship positions suggests that the capacity of the system to absorb increasing numbers of doctoral graduates is already strained in some sectors. There are signs that, although we may continue to produce larger numbers of doctoral graduates every year, the lack of growth in new posts in academia and other knowledge-intensive sectors may soon translate into lower employability rates for doctoral graduates in the country. This phenomenon is particular evident in some STEM fields, particularly in the biological and environmental sciences, where increasing numbers of graduates end up in one postdoctoral position after another.

The study makes a significant contribution to the evidence that (a) doctoral students in South Africa commence their studies at an average age of 34; (b) there are large age differences between fields; and (c) the majority of doctoral students in the country (60%) study while employed. Given the dynamic life of policy and the ongoing incorporation of new knowledge into evidence-based policymaking, this evidence creates a more comprehensive lens through which to view the most recent DSI-NRF funding policy, in particular the focus on students who are not older than 32 at the start of their PhD studies. This policy position should be reviewed to determine the extent to which it contributes or does not contribute to national development objectives. Similarly, the finding that more than 30% of all doctoral students in the study were from the rest of Africa highlights the need to promote greater uptake of doctoral studies by South Africans or increasing the proportion of funding support for non-South Africans to more than the 5% of the total DSI-NRF postgraduate budget.

Further policy recommendations include the following:

1. **Tracer studies of PhD graduates (or some form of tracking) should become a regular feature** of higher education and labour studies in the country. The NRF digital platform for tracking its funded postgraduate students is a step in the right direction, but the establishment of complementary regional or institutional databases should be considered for students who may not have been funded by the NRF.
2. **Further research into the financing of doctoral studies should be undertaken** to get a better understanding of how doctoral students are financed and supported by universities, employers and funding agencies, as well as how these different funding modalities affect PhD studies and graduates' subsequent career trajectories.
3. **More work is needed to understand how changes in the nature of work are affecting expectations of the kind and range of skills doctoral graduates should have.**
4. The relevant role players (including Universities South Africa, the DSI, the Council on Higher Education and funding agencies) should **collectively investigate how the position and status of postdoctoral fellows can be strengthened and what measures are required to ensure that the value and talent of this group is not lost** to academia or the science system in general.
5. **Further investigation into the absorptive capacity of the economy's knowledge sector should be undertaken** to ensure optimal alignment between the supply of and demand for highly skilled graduates.

Conclusion

This study is the most comprehensive tracer study to date of PhD students who graduated from South African universities in the recent past. The findings presented in this report provide, for the first time, accurate, precise and generalisable information on a wide variety of issues – the employability of South African doctoral graduates, the financing of doctoral studies, the differences in the career trajectories of full-time and part-time students, the challenges facing postdoctoral fellows, the absorptive capacity of different employment sectors and the geographic mobility of doctoral graduates. The report also gives new insights into the perceived value and utility of pursuing doctoral studies. The study would be a valuable baseline for any future studies of this nature.