

# Chapter 2

## How Might You Use Your Doctorate, if You Get One?

### 2.1 Overview

This chapter will give initial ideas on where you can use a doctorate if you obtain one. To put some structure into this topic, we will examine the university, private and government sectors separately. However, in truth, there is much overlap. It is also possible to move between these sectors. Specific examples of people who have successfully made the transition in both directions will be provided later in the book.

### 2.2 Positions that May Require a Doctorate

#### 2.2.1 *University Employment*

A doctorate is a necessary prerequisite to gain employment in a university.

If you seek employment in a university as a fresh doctoral graduate, then your options would include the following:

- a postdoctoral position (possibly abroad) involving research on an externally funded project
- a junior faculty position including teaching and/or research.

In the long run, your options within the university sector include either specializing or diversifying your research interests and ultimately becoming a full professor. You might move into administration or management positions such as Dean of a Faculty or even President of a university.

To illustrate, Graham, upon finishing his doctorate in Australia, took up a junior faculty position at Imperial College (part of the University of London) in the United

Kingdom. He later returned to Australia where he moved through the academic ranks to full professor. He changed his research focus repeatedly. Indeed, Graham aimed to “reinvent” his research direction every five years. This was challenging but also refreshing and, ultimately, rewarding. He was a regular faculty member for a quarter of a century, then became Dean of a Faculty and ultimately returned to a full-time research position.

### **2.2.2 Private Sector**

If you are a fresh doctoral graduate wanting to work in the private sector, then, in the short term, it is probably best to apply for a position where your specific field of expertise is relevant. However, eventually you may be given the choice to either stay in the same technical stream or move to another technical area. Alternatively, you may choose to progress to a more managerial or leadership role.

To illustrate, Stefan began his industrial career by becoming head of the advanced control department in a refinery. This position was close to his field of technical expertise as he had previously worked as an Associate Professor in the area of advanced control engineering. Once in industry, he increasingly built his management career and became CEO for an aviation joint venture company. Expanding on the business and strategic skills he acquired in this position, he diversified to becoming the chief strategist for the international part of the corporation. He then served on the board of an aviation venture company and as CEO of a crude pipeline company. On leaving that company, he moved to South Africa where he started a company which offers personal and business coaching. The latter job combines all of his earlier acquired skill sets.

Many of the doctoral graduates we have known ended up working in industry. The jobs are many and varied. Some of the positions are

- Designing and running Induction Heating Furnaces.
- Managing a major egg producing company.
- Being a senior process engineer in the Sugar Industry.
- Working on Marine Engine design.
- Working as an Advanced Process Control engineer.
- Acting as a Process Control consultant.
- Working for a Mining Company.
- Working for a state-owned industrial R&D institution.
- Working (indirectly) for a major mobile telecommunications company.
- Working (directly) for a mobile telecommunication company.
- Running the Computer Operations for a company involved in gambling.
- Designing a new generation of electric vehicles.
- Working for an investment company.
- Designing supply chain systems.
- Writing software for train scheduling.

Not all of these jobs were directly related to the specific topic of the person's doctorate. However, the doctoral training gave the person the skill to tackle a difficult task and bring it to completion. The doctoral training was thus a crucial aspect of their career trajectory.

To further illustrate how a doctorate can be used in industry we quote the case of Meng Wang who has a position within Ericsson AB in Stockholm, Sweden. He commented as follows:

“A doctoral degree can be of great importance in industry, in particular for those companies that emphasize and invest in research”.

“For the part of Ericsson Research for which I work, more than 70% of the employees hold doctoral degrees from Sweden or overseas. This proportion is even higher for new recruits. Compared to other departments, the jobs within the research department are more conceptual or theoretical. The research methodology is similar to academia but is more focused and has more limitations. For example, how to further cancel some type of interference for a given specific telecommunication system, or how to predict the performance if one were to add some new feature to the standard. On the other hand, in other departments (such as system design or development), a doctoral degree may not be so important. These latter departments focus more on implementation issues, for example software development. In these situations, high level programming skills could be more important than a doctoral qualification”.

### **2.2.3 *Government Sector***

Other opportunities for doctoral graduates lie in the government sector. The opportunities in government can include government research laboratories or government accreditation offices. Doctoral graduates are also highly sought after by procurement agencies to research and advise on new defense technologies. Another avenue for a doctoral graduate in government is as a legislative advisor.

As an illustration, we mention the career of Julio Braslavsky. After completing his doctorate, he first worked in a university-based research group focusing on R&D projects connected with the mining industry. He later joined a government research organization in Australia (CSIRO) where he manages a research team working on renewable energy.

### **2.2.4 *A Private Consultant***

A doctorate often provides high-level expertise in a particular applied area. This expertise can then be exploited by becoming a private consultant. We can quote

many examples of people who pursued this career choice, e.g. one who became a consultant in environmental remediation and another who is a consultant in anodic protection.

Consultants offer high-level advice to industry. They typically lead customers to articulate their problems and then to find solutions. Training at the doctoral level can be invaluable in helping a customer understand their difficulties and to find solutions.

## 2.3 Skills and Passion

As we have seen from the previous section, there exist a wide variety of options where one can use a doctoral qualification. One of the reasons for this wide diversity is that a doctoral degree goes beyond your specific specialization and includes the acquisition of other skills that will help you as your career progresses. These skills include

- perseverance
- networking
- the ability to ask deep and meaningful questions
- the ability to analyze data
- the ability to see things in data that others have overlooked
- the ability to convince other people about the value of your ideas
- the ability to organize material so that others can readily understand and appreciate it

Doctoral training includes tackling a hard task and seeing it through to completion.

A good compass to find your personal way amongst this amazing variety of options is to follow your passion. This may lead to surprising twists and turns.

For example, Rowan Atkinson started his career by completing a Masters of Science Degree with the title “The application of self tuning control”, in 1978 at Oxford University. However, he did not continue with a doctoral qualification. He moved from an engineering degree to the field of entertainment. Indeed, you probably know Rowan Atkinson as “Mr. Bean” or “Black Adder”.

Conversely, Dr. Brian May, the brilliant musician and lead guitarist of the rock band Queen began a doctorate in the 1970s. He finally completed his doctorate in Astrophysics in 2007 at Imperial College, London. He was a collaborator on the New Horizon Pluto Mission with NASA and served as Chancellor of Liverpool John Moores University from 2008 to 2013. We will include a specific contribution from Brian later in the book—see Sect. 9.2).

As another example, some of our readers may have heard Professor Brian Cox (A Royal Society Research Fellow at the University of Manchester) present his wonderful science shows for the BBC. Interestingly, Cox was also the keyboard

player for the pop group D:Ream. He completed his doctorate in particle physics after D:Ream disbanded.

The trick is to find what you love doing because this is where you will both excel and find satisfaction.

This was beautifully articulated by Steve Jobs (former CEO of Apple) in his Stanford University commencement speech on June 12, 2005 (see Ref. [1], Further Reading).

We encourage our readers to listen to this speech or to, at least, read it.

## 2.4 Summary

In this chapter, we have described a number of activities and careers that doctoral graduates can choose. Do any of them inspire you? Could you see yourself passionately engaged in any or perhaps several of them?

Remember that many doctoral graduates move across several fields during their career (see Sect. 2.2.3). So, for now feel free to identify with, or feel inspired by, several of the options we mention

- University Employment (see Sect. 2.2.1).
- Private Sector (see Sect. 2.2.2).
- Government Sector (see Sect. 2.2.3).
- Private Consultant (see Sect. 2.2.4).

For perspective, about 45% of Graham's doctoral students have chosen the university sector, 45% the private sector and 10% either the government or consulting options.

Recall that we offer a decision-making tool on the book's website. This is intended to further focus your decision-making process.

## 2.5 Further Reading

- [1] S. Jobs "Stanford University Commencement Speech, June 2005" Stanford Report, June 2005.
- [2] Australian National University "PhD students: Careers outside academia" ANU Careers Centre.
- [3] P. Gosling, B. Noordam "Mastering your PhD, Chapter 21 Putting it all Together: a PhD, So What's Next?" Springer 2nd edition, 2011.



<http://www.springer.com/978-3-319-45876-2>

A Doctorate and Beyond  
Building a Career in Engineering and the Physical  
Sciences

Goodwin, G.C.; Graebe, S.F.

2017, XXI, 193 p. 19 illus. in color., Hardcover

ISBN: 978-3-319-45876-2