7TH EDITION

PHILLIPS AND PUGH'S

HOW TO GET A PHD

A Handbook for Students and their Supervisors

Estelle M. Phillips Colin G. Johnson

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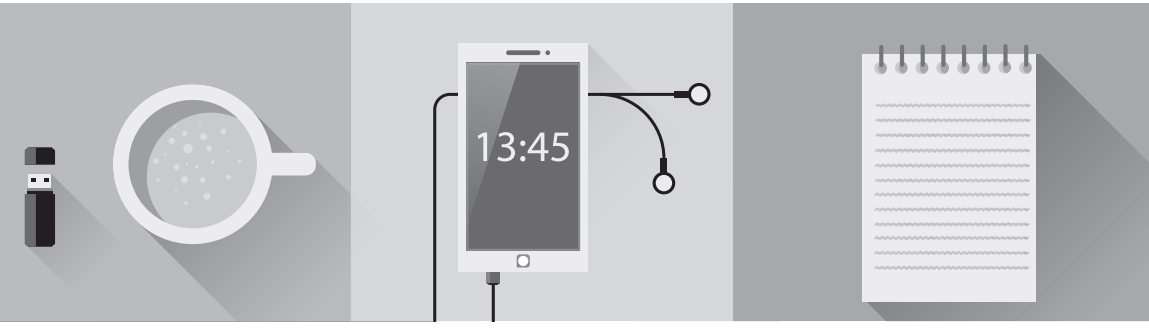
A handbook for students and their supervisors

Seventh edition



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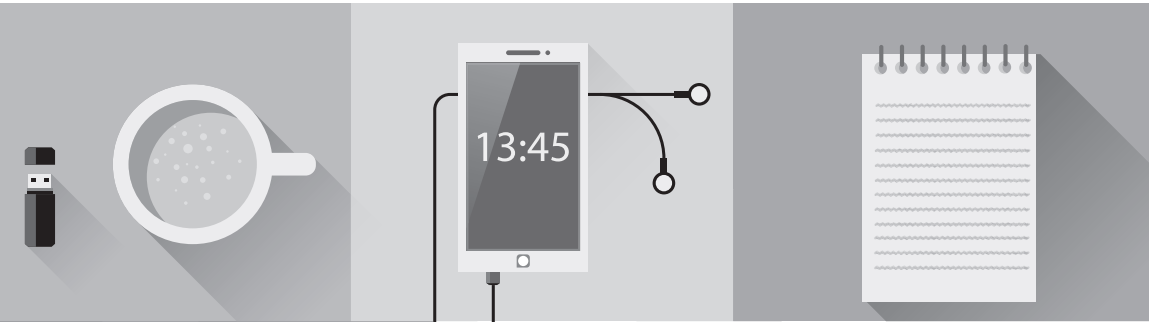

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Praise Page

"The 7th edition…! How to get a PhD is proving its status as a must read for PhDs and supervisors. The book still contains brilliant chapters like 'How not to get your PhD', and 'Managing your supervisors'. But it is also enriched with wonderful chapters like 'Writing a PhD' and the action summaries that open each chapter. The authors are also not afraid to take on challenging positions that put PhDs and supervisors on edge. Although the book is written from a British context, it has an international feel. PhDs, supervisors and graduate programme directors all over the world will find inspiration!"

Dr Hans Sonneveld, Netherlands Centre of Expertise for Doctoral Education

"A fresh update to a true classic. This is one of the most reassuring and useful books you will ever read about doing your PhD, no matter your topic - or where you are enrolled. Just about every concern you can imagine is addressed inside, including what an 'original contribution to knowledge' really means and the difficult art of supervision management. I've been using this book in my work with PhD students more than 15 years and cannot recommend it more highly."

Professor Inger Mewburn, Director of Researcher Development, Office of the Dean of Higher Degree by Research, The Australian National University, Canberra, Australia

"This myth-busting, pragmatic map of the researcher journey includes the insider how-to information for someone weighing up the decision to start a PhD and looking for detailed first steps. Answering 'what I wish I'd known at the beginning' questions, this book will also be relevant to those in mid-candidature who need a no-nonsense practical guide for getting their thesis back on track. Final chapters are aimed at supervisors and institutions, emphasising the social and structural aspects so intrinsic to PhD success. Focussed on the UK, but relevant for all Commonwealth systems, this classic gives inclusive advice for full-time, part-time studies or students from non-traditional pathways, across disciplines and a range of motivations."

Dr Katherine Firth, The University of Melbourne, author of How to Fix your Academic Writing Trouble: A Practical Guide and Your PhD Survival Guide: Planning, Writing *and* Succeeding in your Final Year

"This is a welcome updated edition which draws upon current research and reflects changing practices. The book offers a practical and accessible guide to students and supervisors. What I really liked about this book is the way in which it speaks directly to the student and supervisor and emphasises the importance of the student supervisor relationship. A must for every academic bookshelf."

Dr Mary Knight, Honorary Senior Lecturer, School of Education and Social Work, University of Dundee, UK

Dedication

This seventh edition (35 years after the first) is dedicated to

Gilad, Liat, Shani, Richard, Oliver, Zac, Georgia & Jake
plus Mia and Tami
together with
The Pughs and the Ariels

Contents

About the authors

Dr Estelle M. Phillips, recently retired, enjoyed a long career as an academic and independent educational consultant. She has published widely on various aspects of the PhD process and has spoken at universities on four continents about the skills required to complete and supervise a PhD.

Dr Colin G. Johnson is Associate Professor in the School of Computer Science at the University of Nottingham. He is an experienced PhD supervisor and examiner and was formerly the Associate Dean for Graduate Studies in the sciences at the University of Kent.

Professor Derek S. Pugh (1930–2015) was Emeritus Professor of International Management of the Open University Business School, UK. He published 17 books and over 100 papers in his field and had considerable experience in the design of doctoral programmes and the successful supervision and examination of PhD students.

Preface to the seventh edition

The gratifying response to the previous editions of this book testifies to the need of research students and their supervisors to understand the processes of effective doctoral education. The number of translations into other languages – Reformed Chinese, Spanish, Portuguese, Classical Chinese, Russian, Arabic, Korean, and Japanese (in chronological order) – demonstrates that the issues covered here are highly relevant in many countries. This need to understand is reinforced by the considerable institutional change currently taking place in the higher education system in the UK. Since our first edition in 1987 opened up the subject for debate, many of the developments we have advocated have come about: greater university recognition and support for doctoral students, effective monitoring of student progress, training for supervisors in teaching research, establishing codes of practice of the responsibilities of both supervisors and students, and so on. And the changes are continuing apace. It is therefore appropriate to offer a new edition, revised and updated to the present day.

As before, we received much information, suggestions, and constructive criticism from the anonymous referees of the previous edition. We would also like to acknowledge Bradley Reback for helpful comments and suggestions, and Sam Crowe, Beth Summers, Hannah Jones, Ali Davis, Bryony Waters, Laura Pacey, Dominic Kennerk, David Cummings and Karen Harris from McGraw-Hill/Open University Press for stalwart support during these difficult times. We should like to thank Janet Metcalfe and Vitae, who are the joint holders of the copyright with DSP, for permission to reproduce the 'Self-evaluation Questionnaire on Research Student Progress' at Appendix 1.

In this book, we aim to present a realistic picture of the tasks that a doctoral student faces in obtaining the degree. Our intention is not to 'sell' the doctorate but to ensure that students know what they are undertaking. A number of potential students have told us that, after reading this book, they have decided that doing a PhD is not for them. We regard this as a perfectly appropriate outcome.

But it has been suggested to us that this approach inevitably gives too great a focus on the 'pathologies' of the doctoral process. We fear that this may be true, and so we should like to reiterate here the positive aspects of being a PhD student. The joys of doing research are considerable, and anyone in a position to carry out research is indeed privileged. Feelings of exploration, excitement, challenge, involvement, and passion are frequent and are commented on in this book. The enormous feeling of achievement on the award of the degree lasts for many throughout their whole lives.

Clearly, the process is very rewarding, otherwise so many would not have carried it through successfully.

This book has grown out of EMP's own PhD research, a continuing series of studies of research students, the seminar on the process of PhD-getting conducted by DSP for a number of years at the London Business School and subsequently by EMP and DSP at the Open University, CGJ's experience as Associate Dean for Graduate Studies at the University of Kent, and the extensive experience that all three of us have had as PhD supervisors and examiners.

We should like to acknowledge the help of all those who contributed to these activities over the years and who, together with those who participated in our seminars, form the 'cast of characters' in this book. We learned a lot from all of them and we are most grateful.

In preparing this seventh edition we have missed enormously the contributions of Derek Pugh, who died shortly after work on the sixth edition was complete. His insight, intelligence, breadth of knowledge, and wit were key to the character of the book. We have endeavoured to retain the distinctive style of his writing, his elegant phrasing, and his thoughtful advice as we have revised the text.

Estelle M. Phillips (EMP)
Colin G. Johnson (CGJ)

Chapter 1

On becoming a research student

Action summary

1. Be aware that in doctoral education you are under your own management and have the responsibility for determining what is required, as well as carrying it out.
2. You will experience periods of self-doubt that you must overcome with the clear aim of achieving your PhD.
3. Use this book as and when you need it. Think of it as a friendly guide throughout the duration of your PhD studies.

This book is a handbook and a survival manual for PhD students. If you are intending to embark on a research degree, it will introduce you to the system and, by increasing your understanding, help you to improve your choice of university, college, department and supervisor. It will also guide you through the process of working on your PhD, right through to the final examination and completion of the doctorate.

If you have just picked this book up and you are already a research student, then you should read it thoroughly – and hang on to it so that you can refer to it frequently. You will need to do this because we shall be discussing the skills and processes that are crucial to obtaining the PhD degree. The book is structured so that different chapters are relevant to different phases of the work.

If you are a supervisor, or contemplating becoming one, the book is highly relevant to you too, because it deals with the educational processes that it is your responsibility to encourage for the successful completion of your students' research degrees. Specific advice for supervisors is given in Chapter 11.

If you are a senior academic administrator, the relevance of this book is that it provides a guide to procedures and systems concerned with research degrees, which will enable you to evaluate the adequacy of the provision your university is making for research students. Specific advice for institutions is given in Chapter 12.

The book focuses on process issues that are not discipline-specific. It cannot help you to design an investigation or an experiment, as these activities require professional knowledge of your particular field. Similarly, it does not deal with the financial difficulties of doctoral students, which will vary considerably depending on your circumstances (see www.postgraduatestudentships.co.uk and www.findaphd.com).

Nor does it consider factors impinging on you after you have completed your course such as the employment options available to PhDs. Delamont and Atkinson (2004) discuss developing a postdoctoral research career, and there is advice on developing a postdoctoral career in Ratcliffe (2015), Gould (2020), Smith et al. (2021), and Woolston (2017).

But the book does suggest that you ponder some basic questions before embarking on a course of study leading to the PhD degree. Do you want to spend three to four years of your life doing research on one topic? Or even longer if you wish to become a part-time student. Will you be satisfied to live on comparatively little money for that time?

Are you committed to a PhD? Are you able to tolerate regular periods of intellectual loneliness when only you are responsible for producing 'creative thoughts'? It is vital that you give a firm 'yes' in answer to all those questions. You must make the decision to study and work for your doctorate based on the sure knowledge that it is the right thing for you. If what you really want is to write a bestseller, then conducting research for a thesis is not the optimum way to go about it. Perhaps you don't really know what you want to do with the rest of your life, and continuing in the university system seems a good way of putting off that decision. If this is so, then you have chosen an extremely difficult way of solving your particular problem.

The nature of doctoral education

The PhD – at least in the UK – is a degree programme consisting solely of working on a research project over three or more years, under the supervision of experienced academics in your field. People studying for a PhD are variously referred to as PhD students, PhD candidates, research students, graduate students, postgraduate students, and doctoral researchers. To accustom you to this diversity of terminology, we use various terms throughout the book. Acquiring the skills and understanding of the processes necessary for success cannot be done at a single reading. As a

research student, you need continually to use the ideas in this book to develop your own insight into your own situation. In this way, your professional learning will develop as it should – under your own management.

'Under your own management' is the key to the nature of doctoral education. In undergraduate education, a great deal, in academic terms, is organized for the student. It may not have seemed like that to you at the time, because you were required to do a considerable amount of work, but, for example, syllabuses were laid down, textbooks were specified, practical sessions were designed, the examinations were organized to cover a set range of topics in questions of a known form, and so on. You could quite reasonably have complained if asked about an extraneous subject, 'But no one told me that I was supposed to learn that topic (or methodology or theory or historical period)'. For the most part, you were following an academic course set by your teachers.

In doctoral education, you have to take responsibility for managing your learning and working on your own project for the PhD. You are, of course, given support on this challenging journey. The primary mechanism is through your supervisors—members of academic staff in your field, who provide advice and guidance. You will have regular meetings with them throughout your PhD. In the book, we refer to these as tutorials, though other people call them supervisions or supervisory meetings. We discuss them further in Chapter 6. You will also get less formal advice from other academics in your department, from fellow students, and often from a university-wide graduate school. Whatever others may say, ultimately you need to take responsibility for your programme of research, and for the content and structure of your thesis. If it turns out that you need a particular topic or theory for your work, then it is no excuse to say, 'But nobody told me it was relevant'. It is your responsibility.

So you will not be traversing a set course laid out by others. You will be expected to initiate discussions, ask for the help that you need, argue about what you should be learning, and so on. You are under self-management, so it is no use sitting around waiting for somebody to tell you what to do next or, worse, complaining that nobody is telling you what to do next; in the postgraduate world, these are opportunities, not deficiencies. You will probably find it helpful to read this book as and when you need it. Just dip into whichever part of it you think will give you the necessary answers for any specific problem that crops up during your time as a doctoral student, using the very full list of contents that we have given on pages ix–xv. The book is not intended to be read from cover to cover, as parts of it will not appear relevant to you until you find you have reached the appropriate stage of your work.

The overall university framework for research students ensures that there is a basic similarity for all doctoral candidates as they progress through their studies. But there are also some notable differences between

the research cultures of university disciplines, particularly between the culture of the laboratory-based sciences and that of the humanities and social sciences. To a considerable extent, these stem from the large capital investment in equipment and materials required in scientific research.

Supervisors in science have to take the lead in obtaining the physical resources and the research personnel required. A studentship may be allocated and a doctoral student recruited specifically to work on a designated line of research, fitting alongside the work of others in the laboratory. In this situation, the 'apprenticeship' aspect of being a doctoral student is emphasized. The student's research topic will be clearly defined to fit in with the innovative thrust of the supervisor's research programme, and this will set limits to the level of research creativity that can be shown. The student will be required to do 'dogsbody' work in the laboratory or on the computer as part of professional training. In these circumstances, there develops what might be called a 'joint ownership' of the doctoral research between supervisors and the students. Supervisors will have a strong interest in getting the research work done and using the results obtained. Joint papers will be the norm. The danger to watch for in this culture is the exploitation of the student, leading to the feeling of being just an extra pair of hands for the supervisors' research. It must be remembered that there has to be a sufficient amount of autonomy for the student to be able to make an original contribution. It is this that justifies the award of the PhD degree.

In contrast, in the humanities and the social sciences, students often come with their own topic within the field in which the supervisor is expert, and academics give a service of research supervision. Being busy people, supervisors often have to ration the amount of attention they can give. Research supervision has to compete with the supervisor's own current research (which can be considerably different), undergraduate teaching and administration. Supervisors will have only a general interest in the results of the student's research, and will act more as role models than as apprentice-masters. The danger to watch for in this culture is the neglect of the student for long periods – weeks, months, even years. It must be remembered that students need the regular support of supervisors if they are to develop sufficiently to achieve the PhD degree.

These descriptions are of extreme situations; there are many shades of grey in between. There are scientists who give an individual service to their doctoral students and social scientists who build up a team of students all working on related aspects of the same topic. You must work to understand the situation into which you are entering.

In recent decades, a number of professional doctorates have arisen in areas such as education, pharmacy, practical theology, and clinical psychology. These combine advanced training with a work-based project. Usually, the thesis is shorter and less ambitious in scope than the PhD, because it is just a part of the assessment for the qualification. We discuss these

briefly in Chapter 5, but more thorough guidance is given in the books by Smith (2008) and Fulton et al. (2013).

Universities consider it not to be in students' best interest to rely on only one supervisor for each student. Departments have supervisory teams with two or three members, a lead – or main – supervisor and one or two associate supervisors. This team must contain a subject specialist and someone responsible for pastoral support and broader advice on research. The team system can allow for new supervisors to learn how to supervise more effectively under the guidance of an experienced member of the department. There will also be an academic in your department who is known as the research tutor (or postgraduate tutor, director of graduate studies, or similar title). This person takes overall responsibility for PhD students in the department, and for the process of reviewing research students' progress and approving their advancement onto the next stage of their studies. You can also turn to them for advice if, for example, you are having problems with your supervisor or want to change your supervisory team.

The psychology of being a research student

New research students enter the system determined to make an outstanding contribution to their subject. By the time they start the final stages of thesis-writing for the degree, they are determined to 'get it and forget it'. During the intervening years, their enthusiasm has been dampened by the demands of having to concentrate on a specific topic and conduct routine and repetitive tasks in an atmosphere where nobody seems either to understand or to care about their work.

They come into the university or college knowing precisely who they are: successful and intelligent holders of well-earned qualifications. It is not long before they lose their initial confidence and begin to question their own self-image. This is the result of contacts (no matter how sporadic or from what distance) with academic discourse. Such contacts could come from members of staff, postgraduates who are further into their research than the first-year students, and papers published in journals or presented at conferences. These challenge the assumptions and conceptions that the young graduates had accepted as inviolable. From this period of self-doubt and questioning, the successful postgraduates emerge with a new identity as competent professionals, able to argue their viewpoint with anybody regardless of status, confident of their own knowledge but also aware of its boundaries. This new identity permits them to ask for information when they are aware that they don't know something and to express a lack of understanding when this is necessary, instead of pretending that there is no difficulty for fear of being thought stupid. To arrive at this point is what being a postgraduate research student is really all about.

Throughout this book, we focus on these psychological aspects alongside the practical and academic aspects of PhD study. It can also be useful to talk to other research students at different stages in their PhD journey. There are also opportunities to read about and discuss PhD study online, through forums, diaries, and blogs on sites such as www.postgraduateforum.com and thesiswhisperer.com. There is an active PhD community on Twitter, too: see the hashtags #phdchat and #phdlife and accounts such as @PhDVoice.

The aims of this book

The need for personal academic initiative is the key cultural change that doctoral students will encounter compared with their undergraduate days. It requires a different style of operation, which is why it is not sufficient just to state the issue as we did in the previous sections. Students need information and insights to develop the capacity to operate successfully in the postgraduate environment. We have seen many full-time students take long periods (one year or even two!) in adjusting to the environment, at considerable jeopardy to the achievement of their doctorates. For part-time students, this period of adjustment becomes even more difficult to manage.

Some students never come to terms with it and go away indignant, bitter – and without PhDs.

All new postgraduates, whether full or part time, have to be prepared to unlearn and rethink many of the doctrines which they have had to accept up to this point in their student career. A vital aspect of this rethinking is to take the initiative in discussing with your supervisor the whole range of your ideas, including any that might even appear to be 'off-beat' or 'illegitimate' but may in fact turn out to be surprisingly useful leads.

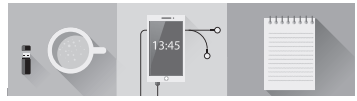
The first aim of this book is to explore such issues in a realistic way in order to help you understand and achieve the tasks necessary to complete the PhD successfully. Our second complementary aim is to help supervisory practice in managing the process better. The third aim is to put the whole activity in its context, since the recognition by universities of their institutional responsibilities in improving the effectiveness of doctoral education is a key factor in promoting necessary change.

In attempting to achieve these aims, we shall be drawing on our experience in doctoral supervision and our systematic research into PhD education. We give real-life examples of students and their supervisors. These reflect the diversity of students, both full and part time, from different backgrounds and demographic groups, that are found in higher education. We also give examples from a range of disciplines including arts, business studies, science, social science, and technology. We shall be examining the characteristics of the educational system, the nature of the PhD qualification,

psychological aspects of the PhD process, and how to manage your supervisor, among many other practical topics.

Appendix 1 comprises a self-diagnostic questionnaire on student progress to help you focus on issues that are relevant to you. Appendix 2 provides supervisors with some food for thought. Appendix 3 gives some examples of letters of introduction and application.

Chapter 2



Getting into the system

Action summary

1. Get as much information as you can before choosing your academic institution. Find out about potential supervisors, research culture, the working environment, and how PhD studies are organized in your subject.
2. Find out about a potential supervisor's research experience, publishing record and supervisory management style before making your decision.
3. Ensure that you understand the eligibility requirements both for entry into the research degree programme of the university and of grant-awarding bodies. Know whether you conform to them or can make a special case for exceptional treatment.
4. Very early on, arrange with your main supervisor to carry out a small initial project with definite deadlines to get you into the system. On completion and writing up, discuss not only the results but also how you went about it and what you can learn about the process.
5. Work at personal relationships with your supervisors and fellow doctoral students. Set limited goals and achieve them.

Once you have decided to continue within the higher education system and conduct research for a PhD, you have other decisions to make. First, you have to be accepted by a university department to work in your chosen area of study. Second, you have to get funding for your studies. But which university? In what area? How to apply? How to get accepted? And how to get funding?

Choosing the institution and field of study

In order to be accepted onto a PhD programme, there are two main things that you need to do. First, you need to be accepted by a university as a PhD student. This involves satisfying some general requirements, such as having the prior qualifications needed for entry to the PhD, and demonstrating that you have an acceptable level of English language competence. More importantly, you need to have found a supervisor who will accept you as a PhD student. The second main requirement is that you have arrangements to fund your study. This involves being able to pay your tuition fees, and having some money to pay your day-to-day accommodation, food, and other living costs. You may be in the fortunate position of being able to fund the PhD yourself; but, for most students, you will need to have some kind of bursary from the university, a government or charity, or from your home government. Finally, overseas students will need to satisfy certain requirements about visas and other government requirements.

You will need to identify a number of departments to apply to, based on them having expertise in your area of study. Contrasted to undergraduate study, departments are more specialized for PhD study. Some universities will have no experts in a particular field of study, so it would be inadvisable to register with such a university. You will need to find a supervisor whose research interests are in the same broad area in which you want to conduct your own research.

You should be confident that the research discipline or area in which you plan to study is genuinely one you can see yourself concentrating on very closely for the next three or four years of your life and maybe more. Many PhD students have come unstuck simply because they have lost interest or belief in the area that they chose to investigate.

Furthermore, you should be sure that the university department that you are thinking of applying to has an established reputation in research and a real commitment to the development of doctoral students. Begin by looking at their website, and when you go to the department for interview, do not hesitate to ask about these issues, which are so important to your success. You should collect whatever literature is available about the department, the staff engaged in research, and the precise nature of that research. Find out the departmental rating in the Research Excellence Framework (REF – see the most recent results at results.ref.ac.uk) and how the department intends to develop research in the future. Bear in mind, however, that the REF result is a rating for the overall subject at that university, and that good PhD supervisors might work in departments that have a poor rating overall. Obtain copies of research papers and discover as much as you can about the scope of existing work being done by staff and doctoral students and the possibilities of developing that work into areas of interest to you. Most universities will have a repository of research papers on their website,

many of which will be downloadable directly. Some will have pages for each department, listing staff and their publications.

Find out what is done university-wide – most likely by a Graduate School – to support students in getting research skills and in building a community of graduate students. Ask to speak to current doctoral students and obtain from them a description of the adequacy of the set-up from their point of view.

Accept a place only if you are optimistic on both counts – the suitability of the institution and of the field of study. This optimism will fade soon enough, as we shall see later on in the book, so it is important to have some optimism at the start.

One direct way of finding out about the relevant academic activities is to look on the Internet (or go to a university library) and systematically review the current issues of journals in your subject. You might not be able to access the full papers through publishers' websites, but you can always get a list of paper titles, authors and abstracts. This allows you to locate the researchers who are publishing relevant work. Most university libraries will allow visitors, with a genuine reason, to access their collections for use on the premises; you just have to ask for permission. You can look online to find out information about departments and supervisors, and ask on forums and mailing lists in your subject for advice about up-and-coming departments in your area of interest.

You can obtain useful information via the Internet by using the Google Scholar search engine to explore academic articles in most disciplines. There are also subject-specific databases, which all librarians will be happy to help you with.

A final matter to consider is the space in which you will be working. Most departments will provide some working space for their PhD students, but this will vary a lot between universities. Some departments will provide PhD students with their own desk in a shared office, whilst others will have a PhD workroom with 'hot' desks where you grab any available place to sit. In some universities, the library will have a number of individual workspaces called 'carrels', which you can reserve for a period of weeks or months if you are working on a project that requires daily use of the library collection. If you are working in a laboratory subject, you will clearly have the lab itself as your primary workspace; but, you should check if there is a quieter space where you can work on your data analysis and writing.

You will need to balance what is provided against your own needs. Will you primarily be working at home, and so only need to use workspace at the university on occasion? Or, are you planning a clear separation between work and study by going into the university every day at regular hours? Do you want quiet and solitude from your working space, or is sociability with other students during the working day important? Do you want your supervisor to be just around the corner and available for casual chats, or will this

lead to too much 'policing' of your day-to-day work? We discuss this in more detail (with special reference to part-time students) in Chapter 9.

Making the initial contact

Once you have narrowed down your options to a few departments that appeal to you, contact those which seem most likely to be able to discuss your own plans in the light of what they know to be happening in their department. You should initiate this contact by email, and – if you are still interested – make an appointment to meet at the university, or arrange an online meeting, for example, using Zoom, Skype, FaceTime or telephone. You will find that most academics will be happy to discuss research issues with you. However, you must be precise in your approach. An email that looks as if it has been sent to hundreds of academics may well be ignored. Make sure that you connect the areas of interest that you have for your PhD with their publications. For example, you might propose to take a technique that they developed in one of their publications and apply it to a new area. Another good way to make contact with different people and departments is to take advantage of the open days that so many universities now advertise. Examples of an initial approach email can be found in Appendix 3 (p. 263).

While it is premature at this stage to have planned a complete project, you will need to be able to talk convincingly about the type of research that appeals to you and why you are considering applying to that particular department. If you are considering creating a draft proposal, it may be that the department to which you are applying will be prepared to give you some help in developing it.

A research proposal should include a description of the current state of the field in which you want to work, together with the topic that you hope to focus on in your research. In addition, you must state how you intend to investigate your topic and why you consider it important.

People approach writing in different ways; some prefer to think-while-they-write, while others find that the think-then-write strategy comes more naturally. As it is not at all easy both to (1) say what you want to say and (2) say it in the best possible way at the same time, you may find it helpful to make a rough plan (which you need not necessarily stick to) and then build upon that as you flesh it out. Be sure to write your proposal in readable English, using technical terms as appropriate but avoiding jargon. Try to discover and use the footnoting and referencing conventions of your discipline. Perhaps ask a friend or family member to comment on the proposal, which you can then revise before showing it to your potential supervisor. Finally, you must read what you have written as though it were the work of someone else in order to be critical of your own imprecise phrases

and sloppy style. You can find out more about writing for research in Chapter 7 and some examples of initial enquiry letters or emails in different areas are given in Appendix 3.

Other issues to be borne in mind at this point have to do with the mechanics of getting the work done. Will you have access to appropriate laboratory equipment? What will be provided in terms of computing facilities – a personal laptop/desktop, appropriate software and, if relevant, larger-scale computing facilities? Are the library facilities adequate for your project, and what arrangements are there for accessing other libraries or obtaining material by inter-library loan? If you will be doing surveys, interviews or questionnaires, what support is available? For example, does the university have access to a panel of participants for these? Does it subscribe to a questionnaire website? Are funds available for travel, or for producing and sending out paper questionnaires? In addition, check the compatibility of the people with whom you will be working – this ought to be an important consideration when making your choice.

A recent survey of UK doctoral supervisors by the UK Council for Graduate Education (UKCGE, 2021) provides useful insight into what supervisors are looking for in potential research students. The most commonly mentioned factor was the quality of the research proposal, followed closely by alignment between the applicant's interest and those of the supervisors. Both of these emphasize the importance of you, the applicant, finding out in detail about potential supervisors' research, and explaining how your research will fit into the context of their ongoing research programme. Of considerably less importance was prior degree classifications, emphasizing the difference between the kind of skills, attitudes, and behaviours needed for success at PhD level compared with undergraduate and master's courses. More highly ranked than previous degree grades was prior research experience. You should therefore prioritize opportunities such as summer research internships, opportunities to publish in the form of a letter to an academic journal, or presenting an extract from your master's dissertation at a local conference. References from prior institutions and the reputation of the university where the applicant had previously studied were two of the lowest ranked factors. This demonstrates that supervisors are looking for applicants who can argue on their own merits, not relying on others to present their case or on the reflected glory of their previous institution.

ATAS certificates for overseas students

In addition to the research proposal, if you are an overseas student you may require an ATAS (Academic Technology Approval Scheme) certificate as part of your application, especially if you are researching in the fields of science and engineering. This is not required of students who are nationals

of EU countries, the European Economic Area, Australia, Canada, Japan, New Zealand, Singapore, South Korea, Switzerland or the USA.

The aim of this certificate is to ensure that overseas students are not studying a topic that could pose a threat to national security or defence. You can apply for one up to nine months before your course begins, and you will typically receive a response within 20–30 days. An ATAS certificate relates to a specific course at a specific university. Most universities will inform you when you need to apply, usually after you have received an offer of a place on a PhD programme. Full details can be found online (www.gov.uk/guidance/academic-technology-approval-scheme).

Eligibility

While it is good practice to follow our suggestions regarding making contact and writing a research proposal, it is even more important for you to establish whether you are eligible to begin working towards a PhD.

The first question here is: do you have the academic qualifications to be accepted as a student for a research degree? Most universities require first or upper second-class honours in a relevant British undergraduate degree; some universities will accept lower seconds, particularly if you have some relevant professional experience. If you already have a master's degree it is usually acceptable, whatever the class of your undergraduate degree.

These are the general requirements that will allow you to progress to the next stage of the process in a relatively straightforward manner. If you do not have them, it does not mean that you will not be accepted, only that a special case has to be made, which will require the strong backing of your potential supervisor. For example, if you do not have a British degree, the university will have to satisfy itself that your overseas degree is of a standard equivalent to its British counterpart. Or you may have a non-degree professional qualification plus considerable practical experience, on which a special case could be made for your acceptance. As we describe on page 15, the regulations for the award of scholarships are normally more restrictive.

In general, we would say that you should not be immediately deterred if you do not have the typical formal qualifications for acceptance. Always explore with potential supervisors whether a special case can be made. It may be, for example, that you could be accepted subject to doing certain extra study, or passing a qualifying examination. Remember, too, that if one institution rejects you, it does not mean that all will. However, if you have had several rejections, it may not be wise to pursue registration. You may need to review your likelihood of success and come to a more realistic estimate of your abilities, or to carry out further study at master's level before applying.

The second question is: what degree are you going to be registered for? If you are a beginner in research and do not already have an MPhil or an MRes (i.e. a master's degree awarded for research) you will, in the first place, often be registered as a general research student or for an MPhil degree. You might be required to take some taught courses before embarking on your thesis work. You may be required to complete successfully a one-year taught programme leading to the award of the MRes degree.

The decision on formal registration for the PhD is then taken after the first year of your research when there is some indication that the work is progressing satisfactorily. You and your supervisors must, therefore, be in close contact to ensure that the case can be made for full PhD registration. At this stage, a title for the thesis and the intended programme of research are presented. If you are successfully transferred to PhD registration, time registered for the MPhil degree is counted as time towards the PhD. Foreign governments often require their sponsored students to be directly registered for a PhD, and universities with many international students are adapting their regulations to register students for a PhD from the beginning.

The third question is concerned with the limits of the period allowed between registration and submission. For full-time students there will be a formal minimum time (three or four years) and a formal maximum (four or five years) after which registration will lapse and a special (and very persuasive) case will need to be made for reinstatement. Because of this maximum limit, if you have to abandon your research work temporarily but intend to return to it, you should apply for a formal suspension of your period of studies. This goes by various names at different institutions: intermission, voluntary interruption of studies, break in study, etc. There will be details of how to apply for this on your university's website.

The fourth question is whether there are any special arrangements for part-time students. In fact, the time limits are set roughly pro rata: four or five years minimum, seven or eight years maximum. Don't forget that if you are employed by your institution as, say, a research assistant, you may find that you can be counted as a full-time student even if you are working only part-time on your PhD. This fudge is allowed because the basic nature of the PhD is as a professional training, and research assistants get a great deal of this training as part of their jobs.

When registration has been completed, you should be informed formally of: your supervisors; the topic or field of study for which you have been accepted; the minimum length of study time required before submission of your thesis. Continuing registration in succeeding years is usually dependent on adequate progress being made each year. This progress is assessed after submission of a written report by you about your work, a report written by your supervisors, and an interview or presentation. Do make sure that you allow time for this process at the end of each year.

Grants and research support

Another important aspect of becoming a PhD student is to make appropriate arrangements for funding; that is, to be able to pay your tuition fees, and to be able to fund your living expenses during your PhD. You may be able to do this yourself, but most students will need to find some way of financing it.

There are a number of sources of funding:

- Most universities have a scholarship/studentship scheme. Some universities call them scholarships, some studentships, but the way that they work is identical. Only a certain number of places are available, which are awarded through some form of competition; you will need to keep a careful watch on the university websites for deadlines. Sometimes these scholarships are centrally administered by the university, sometimes by departments. These may be restricted to a certain group of students (e.g. UK students), or they might be restricted in terms of subject areas. Sometimes there are specific scholarships available as a result of donations to the university – these can often be very specific.
- Some universities will have a graduate teaching assistant scheme. This is where you are awarded a scholarship, but in return have to do a certain amount of teaching, typically laboratory demonstrating or running seminars.
- Universities will often receive scholarships from UK Research and Innovation (UKRI), the main government research funding body, or from research charities such as the Leverhulme Trust. Again these will be allocated by some kind of competition: sometimes for any students within the remit of the funder, sometimes for a particular project or centre. Now that the traditional research councils are amalgamating into one overall organization, we will refer in all cases (including grant awards and funding) only to UKRI.
- Scholarships awarded by your home government. A number of countries around the world have schemes that will fund a number of PhD students to study overseas. You will need to find these out yourself by searching the web or by talking to careers advisers in your country. There are also a small number of international schemes, such as the Commonwealth Scholarships (cscuk.dfid.gov.uk) and the Schlumberger Foundation fellowships (www.slb.com/who-we-are/schlumberger-foundation).

There are several sources of information about scholarships. Individual university websites are a good starting point. In addition, there is a reference book called *The Grants Register* (2021), updated annually, which you may find in a library (it is exorbitantly expensive to buy). Some websites

(e.g. www.findaphd.com and www.jobs.ac.uk) are also useful starting points for further exploration. If you find that you meet the criteria for a particular scholarship, you would be well advised to apply far in advance of their advertised cut-off date. You must obtain and study the relevant regulations and be aware that exceptions can be made, which might be worth exploring. Your financial situation should be part of your initial discussion with your potential supervisors.

In many cases, there is no separate application process for universities' own funding. The university application form will have a section about funding opportunities, and you will be put forward for competition for any scholarships in their control. For other scholarships, you will have to look on individual websites for details. The process of competing for a scholarship will vary from scheme to scheme: in some cases, universities will just use the information in your application; in others, you may have to attend an interview or write an additional case for why you deserve funding.

If you are awarded a studentship, it will be for a set period (three or four years). There are considerable variations in the operation of grants. Some are tied to specific research projects, some come from UKRI and may require you to take particular courses in the first year (which may lead to an MRes, the so-called '1 plus 3 system'), while others are linked to industrial collaboration. Remember that in certain circumstances, it may be possible to obtain an extension of the grant. You have to keep your supervisor aware of this possibility and make sure that a strongly supported application is made at the appropriate time.

In some cases, a scholarship might not cover the whole cost of doing a PhD. For example, it may fund just the tuition fees. If you are offered such a scholarship, it may be that you will be hoping for some casual work to make up the shortfall. Try to obtain some professional work that helps your academic development if at all possible. It is much better to tutor your subject, or conduct some teaching work in your university, than to work long hours serving behind a bar.

While academic institutions are no longer regarded as being *in loco parentis*, they may act as quasi-employers if you have a grant that they administer. Some, like any good employer, will make small short-term loans to cover an urgent financial problem. These can be repaid by instalments.

Find out from your university what it provides in the way of research resources. These might include a desk, lab space, equipment, and consumable resources (for example, chemicals for your project). You should ensure (via your supervisors, if necessary) that you have them. You also need to be aware that there are often discretionary opportunities available. For example, you may be able to call on technical support from departmental technicians and computer staff, and you may be entitled to apply for financial support for travel to conferences or to visit other institutions.

Centres for Doctoral Training

In recent years, an increasing amount of PhD funding in the UK has been dedicated to Centres for Doctoral Training. These fund a large number of students at a particular university (or small group of universities) to work in a particular field. Such centres may admit between five and fifteen new PhD students each year, all working in the same broad area. Many of these centres have an interdisciplinary focus, involving supervisors from a number of departments in the university.

There are undoubtedly many advantages to being part of such a centre. You will be part of a cohort working on related projects, and so you will have a group of people with whom to exchange ideas. The centre will put on a regular programme of research talks and short lecture courses in the area, allowing you to benefit from cutting-edge ideas. Facilities will typically be well funded. Supervisors will be working primarily for the centre, so their focus will be mainly on PhD students. In some programmes, particularly in the sciences, students are treated as the most junior level of employee contributing to the overall work. This may suit you, particularly if you want a more structured approach to the PhD that is more similar to a conventional job.

There are, however, downsides to being part of such a centre. While supervisors might have close day-to-day contact with you, particularly if it is laboratory-centred, you can end up getting less individual attention. Furthermore, it can sometimes be harder for students in such an environment to carve out their own distinctive piece of work for their thesis, because so much effort is focused on the collective work. If the centre is not well managed, students can become distrustful of each other, fearing having their ideas or results stolen by one of their colleagues working on a very closely related problem.

Overall, though, we believe that these centres offer a good opportunity if you are the kind of student who likes to learn in a more gregarious environment, and see your PhD as a contribution towards a major challenge in your discipline. They are less well suited if you have a distinctive, individual idea that you want to pursue.

Distance supervision?

Many universities offer opportunities for students to conduct research without having to be resident. They normally require a number of visits to the campus during a year and even, in some cases, attendance at residential weekends. Email and Internet technologies have encouraged the development of more flexible registration arrangements. For these reasons, you

must explore thoroughly the range of provision that might be available to you.

There have always been people who, while wishing to study for a higher degree by research, are unable physically to attend regularly at a university. These include potential students who live in areas with no university provision, some people with disabilities, carers, and those with young children who are able to work in their own environment but would be unable to attend university at regular required times. If you are in this position, you may want to consider studying at a distance. Students who have to go abroad for any reason during the course of their studies (e.g. the fieldwork period for anthropology and geology students) can expect a much better level of supervision at a distance than would have been the case in the years before the advent of communication technology, or even the unexpected and rapid onset of a global pandemic.

You can keep in contact with your supervisor, academics in your field, and fellow students from any university by email, text or even Twitter. Videoconferencing technologies such as Zoom and FaceTime not only allow you to see everyone's faces, but more importantly to share documents, charts, and diagrams for discussion. Libraries and journals can be accessed from home.

There is a well-established tradition of undergraduate distance study – indeed, at the Open University, all students are studying at a distance. Many generations of students graduated from this and other distance learning programmes, though it requires a high level of motivation, organization, and self-discipline. Doctoral supervision entirely at a distance is a different matter. The regular interaction needed with one's supervisor must inevitably take place face to face in order for you and your supervisor to spark ideas off one another. It is this process which moves the research forward creatively. While information technology can help the supervisory process to become more effective, it cannot completely replace personal interaction. As with undergraduate study, this mode does require greater motivation and commitment on the part of the student, as the institutional pressures to continue are undoubtedly weaker in their impact if you are alone. It is not an easy research path to take.

We should add that, currently, all British universities insist on a certain period of attendance on campus during the course of study. It is therefore not realistic for a potential student to consider applying to work for a PhD degree completely at a distance.

Selecting your supervisors

Finding the right supervisors is probably the most important step you will have to take. In general, students do not select their supervisors: their

supervisors are allocated by the department or, occasionally, their supervisors may have selected them.

However, it is not impossible to influence the selection yourself and you should certainly attempt to do so. There is certain basic information that you need in order to be confident that a particular academic is an appropriate person to supervise you. The key factor is whether they have an established research record and are continuing to contribute to the development of their discipline. The questions you need to ask yourself include the following: have they published research papers recently? Do they hold research grants or contracts? Is the lab efficiently organized? Are they invited to speak at conferences in Britain and abroad? Positive answers to at least some of these questions are desirable.

Another important aspect to consider when selecting your supervisors is how close a relationship you want. The supervisor–student relationship is one of the closest that you will ever be involved in. Even marriage partners do not spend long hours every day in close contact with each other – at least, not before Covid-19 they didn't – but this could be the case with a student and a supervisor. Some people need to have their supervisors around a lot (especially in the beginning), while others feel it oppressive to be asked what they are doing, and to be told continually what they should be getting on with next.

There are at least two patterns from which to choose with regard to working with your supervisor. The first has already been mentioned: the student needs constant support and reassurance, and the supervisor needs continuous feedback in order to give instruction, thus providing direction for the research. The second pattern is a relationship in which the student needs time to think about the work to be done and needs the freedom to make mistakes during early attempts to get started, before discussing what has been happening with the supervisor. In this relationship, the supervisor must feel relaxed about giving the student time to learn by trial and error. Such supervisors are content to give guidance at regular intervals rather than the direction provided by those who stay much closer to the students and their work.

EMP found that when a student who needs time to plan work and to continue unhurriedly until satisfied that there is something interesting to impart is paired with a supervisor who constantly asks for worthwhile results, the student becomes irritated and feels that the standards required are unattainable. The supervisor feels that the postgraduate is too cautious and unable to work alone. Conversely, when a student who needs constant feedback and encouragement is paired with a supervisor who wants to be kept informed of progress and ideas only at intervals that allow for some development to have occurred, the student feels neglected and the supervisor resents the student's demands for attention (if the student is actually confident enough to ask for more time).

Good communication and rapport between students and their supervisors is the most important element of supervision. Once the personal relationship has been well-established, all else falls into place. If interpersonal compatibility is missing, everything else to do with being a research student is perceived negatively. Therefore, it cannot be stressed too strongly that you should discuss this relationship at the very earliest opportunity, and a tentative agreement about working together should be reached.

Ideally, this is a joint selection process where the main supervisor chooses the student and the student chooses the supervisor. Some universities make a considerable effort to facilitate this, by requiring student and supervisor to have had a number of conversations before the application stage, and in many cases to have collaborated on the research proposal.

Students also need to consider their supervisors' stability in post during their years of registration. While it is usual for supervisors who retire to continue supervising to completion any students they still have, this is not the case for supervisors who transfer to another university.

Starting out as a research student

The institutional induction programmes offered by universities for newcomers into the higher degree system or into the role of research student are very important indeed and we cannot stress strongly enough how vital it is for you to attend. Those who have recently attained a high-quality first degree share with their peers, who have returned to university after some years of working, the confusion and disorientation that comes from not quite knowing what is expected of them.

Often new research students have the idea that people who possess a PhD degree are outstandingly brilliant. This idea inhibits their own development, as they are equally sure that they are not outstandingly brilliant, and therefore cannot really expect to be awarded a PhD. Similarly, if they do read any completed theses, which is something we strongly recommend and will be discussed in detail later (see pp. 31–32), they often emerge convinced that they would never be able to write anything even remotely resembling such a document either in length or quality.

The world that the new research student enters, classically portrayed as an 'ill-defined limbo', involves making a traumatic intellectual transition. It also involves the phenomenon of 'unlearning existing expertise' and having to start from the very beginning in order to discover slowly what one is supposed to be doing. During this time, students might question the whole point of their being in the university.

You should, therefore, make every effort to mitigate these unpleasant beginnings by taking advantage of opportunities offered by the university for you to meet others and begin to feel a member of a community. Talk to

other research students about their experiences of the role as well as their work. Sharing apprehensions helps to resolve them through the knowledge that the problem is not an individual one, but one that is inbuilt into a less than perfect system. Indeed, there are guidelines which universities are advised to follow in providing support for their doctoral students. Student representatives – that is, students who have volunteered to act as intermediaries between the student body and the university staff – can help you in accessing these should it ever be necessary.

It is also important to establish a regular routine of meetings with your supervisor. In this book, we will refer to these as tutorials, but at some universities they are called supervisions or supervisory meetings. The frequency with which these happen will vary from discipline to discipline. The important thing is to establish early on a regular habit of having a thorough and honest conversation with your supervisor about your recent work, your next steps, and the progress of your PhD overall.

It is a sensible move for you to agree a small initial project with clear deadlines at an early interview with your supervisor. The agreement should include the understanding that, once the work has been completed, you will discuss with your supervisor both the work itself and your feelings about it. This exercise will help to clarify any doubts about your ability to undertake research and written work. It will also help to reveal the evolutionary process (corrections, drafts, rewritings, etc.) inevitably involved in the production of theses, articles, and books to publication standard which you have just read with such admiration.

Myths and realities of the system

The 'ivory tower'

One of the most common misconceptions about research is that it is an 'ivory tower' activity, far removed from reality and from social contact with others. If you say you are doing research, people will often talk to you as though you had decided to spend a number of years in solitary confinement from which, in due course, you will emerge with your new discoveries.

It is not like that at all. Although there are considerable periods when you will be working on your own (thinking and writing, for example), this is not the whole story. There is also a considerable academic network of people with whom, as an active researcher, you must interact. These include your supervisors, other academics in your department, the general library staff, the specialist librarian who can provide advice on the library provision in your subject, technicians who help with equipment in the laboratory or with statistical analyses and packages on the computer, visiting academics

giving seminars, colleagues giving papers at conferences – the list is very considerable. To be an effective research student, you must make use of all the opportunities offered. Research is an interactive process and requires the development of social, as well as academic, skills.

Personal relationships

Another popular misconception, this time of supervisors, is to believe that so long as they are on first-name terms with their research students, everything is fine and the student knows that they are friends. Some supervisors even invite their students to their homes or take them to the pub for a drink in order to reinforce this camaraderie. But no matter how far a supervisor may go to assure new students that their relationship is that of friendly colleagues, the reality is that students take a considerable amount of time to become comfortable with this level of informality. This is as true of mature students as of the more traditional new graduate.

The reason why students find this difficult is that their supervisors already have what they want most – the PhD. They have the title of 'Dr' and are acknowledged experts in the chosen field of their research students. The students will have admired their supervisors' work during their undergraduate days, having come into contact with it through lectures or reading, or having heard reference made to it by others. They feel privileged to be working so closely with such individuals, and are aware of the supervisor's authority in the subject and power in the relationship.

You may be in a department with many research students or perhaps you are the only one in your discipline. Either way you will probably meet others at an induction seminar, introductory lecture or other meeting for new higher degree students arranged by your university or student union. Furthermore, online social networks offer a way of making links with other research students at your institution. Maybe there is a Facebook or LinkedIn group, or simply an email list, for PhD students at your university – if not, perhaps you might consider starting one. Does the graduate school or the postgraduate student society have a Twitter account that you can follow? These are particularly important at times of the year when much of the university is shut down; for example, some universities have set up Facebook groups or mailing lists for people who are around the university during holiday times, such as students who cannot simply 'go home' during the Christmas vacation. Furthermore, you might find it useful to join groups on Facebook or LinkedIn that are concerned with your subject nationally or internationally, and to follow both PhD students and experienced researchers in your field on Twitter.

Even if the people you meet are in different faculties, working on topics far removed from your own, it will be helpful for you to have contact with them. Since they are at the same stage as you, they have some understanding

of your own experience. This introduction provides an opportunity for you to make friends outside of your own discipline and to meet people you otherwise might not meet. While training sessions are meant to impart a particular skill, don't underestimate their use as both a place to make contacts and also to provide a schedule. Remember that the first months of a PhD can feel very unstructured. Make it one of your first tasks to get the names, mobile phone numbers, and email addresses of a few of your peers. Use this list to get in touch with them, via email or text, to form a mutually beneficial support group. Mobile applications such as WhatsApp can be useful for this, as they enable you to message a group by text as you would on a group email. Throughout your programme of study, this group will enable you to compare not only how your research is progressing, but also your feelings about it. As in every area of life, personal relationships within the academic community have to be worked at and take time to develop.

Teamworking

'I work alone in a lab, full of people, all research students, all working alone'. This quotation is from Diana, a student in biochemistry, who was part of a 'team' of research students who were all engaged in the search for an effective anti-cancer drug. It exemplifies the situation in scientific research in which a large programme is being funded and the professors who hold the grants gather around them several research students. Each student works on a specific problem. Each problem is closely linked to all the others. In theory, there is a free exchange of information and the whole group works in harmony. In some programmes, however, research students take care to guard closely the work for which they are responsible in case one of the others may discover something that will render their own research unworthy of continuation.

The PhD is awarded for original work. Postgraduates working on a programme such as the one described have two worries: first, that another student's work so closely borders on their own that it will make their work unoriginal or second past the post; second, that somebody else will demonstrate something (for which that other person will be awarded a PhD) that will at the same time show their own line of research to be false.

What is needed is collaboration, not competition, between people who should be making each other's work more comprehensible and less alienating. In well-managed laboratories, regular group meetings are held to ensure that there is a general knowledge of the work that is being undertaken, and good communication about the issues and difficulties involved. Yet often students experience alienation and isolation as the overriding themes of their postgraduate days. The strange thing about this is that sometimes the science students appear to feel the isolation more strongly

than their counterparts in the Social Sciences or Arts faculties. This is because within the sciences there is the illusion of companionship, and the expectation of new postgraduates is that they will be part of a group of friends, as well as a work group. In other faculties, new research students expect to be working alone in libraries or at home, reading, writing, and thinking rather than experimenting. Any socializing that may take place as a result of a seminar, shared room or organized event is then perceived as a bonus.

Chapter 3

The nature of the PhD qualification

Action summary

1. Set out to discover the standards and achievements for a fully professional researcher in your discipline, including the transferable skills usable in other employment, that justify the award of the PhD degree.
2. Read others' PhD theses in your field and evaluate them for the level of originality of research that satisfied the examiners.
3. Be aware that the initial enthusiasm for the research will inevitably decline with time. Show you have the determination and application (rather than brilliance) that are required to complete the work and obtain the degree.
4. Use the full range of services, including taught courses, that your university graduate school makes available to ensure that you have proper support in your studies.
5. Explore the relationship that your supervisors want with you (ranging from beginning research assistant to beginning autonomous researcher) and ensure that it is appropriate for you.
6. The tension between the boundaries of the research project and the time available to complete it should be continually reviewed and adjusted by you and your supervisors.

In this chapter, we discuss the nature of the PhD. We consider the objectives of the process, the part that it plays in the academic system, and the inevitably different aims that students, supervisors, and examiners bring to it.

The meaning of a doctorate

Let us start with some historical background and present in a schematic way the meaning of the degree structure of a British university.

- A bachelor's degree traditionally meant that the recipient had obtained a general education (specializing at this level is a relatively recent nineteenth-century development).
- A master's degree is a licence to practise. Originally this meant to practise theology, that is, to take a living in the Church, but now there are master's degrees across a whole range of disciplines: business administration, electronic engineering, soil biology, computing, applied linguistics, medieval history, and so on. The degree marks the possession of advanced knowledge in a specialist field.
- A doctor's degree historically was a licence to teach – meaning to teach in a university as a member of a faculty. Nowadays, becoming a lecturer is not the only reason for taking a doctorate, since the degree has much wider career connotations outside academia and many of those with doctorates do not have academic teaching posts. The concept stems, though, from the need for a faculty member to be an authority, in full command of the subject right up to the boundaries of current knowledge, and able to extend them. As the highest degree that can be awarded, it proclaims that the recipient is worthy of being listened to *as an equal* by the appropriate university faculty.

Traditionally, the doctorates of British universities have been named for the particular faculty, for example: DD (Divinity), MD (Medicine), LLD (Law), DMus (Music), DSc (Science), DLitt (Letters, i.e. Arts). These so-called 'higher doctorates' are awarded in recognition of a substantial contribution to the discipline by published work, usually over many years. In British universities, the Doctor of Philosophy degree was an early twentieth-century import from the United States. Some universities have in the past abbreviated the title to DPhil, but now all except for Oxford use the designation PhD, which we use throughout this book. It represents a more restricted achievement than the higher doctorates, since it envisages a limited amount of academic work (three years or so), but it still embodies the concept that the holder of the PhD is in command of the field of study and can make a worthwhile contribution to it.

There are a number of exceptions to these descriptions of the meaning of the degree titles, since British universities pride themselves on their independence. Once an institution has become a university, there are no laws that specify which degrees can be awarded, by which institutions, to whom, and on what basis, as is the case in Continental Europe.

Historically, this independence has allowed, for example, the Arts faculties of traditional Scottish universities to use the MA title for their first

degree, while the science faculties use BSc. Traditionally, there was no extra examination for an MA degree at Oxford and Cambridge, only a requirement to continue attendance at a college for a further two years. Nowadays, this has been reduced to paying a registration fee after two years and obtaining the degree without attendance. In medicine, the practice is even stranger: general medical practitioners are given the honorary title of Doctor although they do not have a doctorate from their universities. Indeed, on the basis of their university course, they are credited with *two* bachelor's degrees, although having a licence to practise they exemplify the concept of a master's degree. There are, of course, good historical reasons for these anomalies.

Becoming a fully professional researcher

As we said above, individual British universities are responsible for their own academic standards, but in 1997 the government established the Quality Assurance Agency for Higher Education (QAA). Its remit is to monitor university standards and procedures, identifying good practice and making recommendations; most universities attempt to conform to its guidelines. The QAA (2020) states that

> All UK doctorates, regardless of their form, continue to require the main focus of the candidate's work to demonstrate an original contribution to knowledge in their subject, field or profession, through original research or the original application of existing knowledge or understanding.

Thus the holder of a PhD is someone who is recognized as an authority by the appropriate faculty and by fellow academics and scientists outside the university. In practical terms, it is useful to think of this as becoming a fully professional researcher in your field. Let us try to spell out what becoming a full professional means:

- At the most basic level, it means that you have something to say that your peers want to listen to.
- In order to do this, you must have a command of what is happening in your subject so that you can evaluate the worth of what you and others are doing.
- You must have the astuteness to discover where you can make a useful contribution.
- You must be aware of the ethics of your profession and work within them.
- You must have mastery of appropriate techniques that are currently being used, and also be aware of their limitations.

- You must be able to communicate your results effectively in the professional arena.
- All this must be carried out in an international context; your professional peer group is worldwide. (It always was, of course, but the rate of diffusion is so much faster than it used to be, driven by the rapidity of online communication and increased international travel.) You must be aware of what is being discovered, argued about, written, and published by your academic community across the world.

It is important to note that this list consists both of skills and knowledge – 'knowing that' and 'knowing how', as the philosopher Ryle (1949) put it. It is not enough for someone to *tell* you that this is a fruitful area for study, that this technique is available for use, that you should write a clear paper communicating your contribution. You have to be able to carve out a researchable topic, master the techniques required, put them to appropriate use, and communicate your findings convincingly.

So, there are skills involved in becoming a full professional. The basics of these can be learned by attending courses. To really master such skills, however, you need to practise them in real situations, with support and supervision, and act on the feedback that you get regarding your performance. Some aspects of these skills – Polanyi (1966) called them 'tacit knowledge' – cannot be easily articulated, even by an experienced practitioner. Working alongside experienced individuals, using a certain degree of observation and trial-and-error, will help you to develop the expertise required. The twin elements of exploration and practice are basic to all learning of skills. This is one reason why the PhD takes time.

As though this were not enough, there is a further complication. When you are doing a PhD, you are part of a game in which *the goalposts are continually being moved*. Obviously, what is good professional practice today may tomorrow be inadequate. What is a reasonable contribution to a new topic now, might be old hat by next year. So a final and crucial skill that professionals must acquire is the ability to evaluate and re-evaluate their own work and that of others in the light of current developments. They need to be able to grow with their discipline.

One important way in which you learn to grow academically is by reading papers in your area. These are published in academic journals, which you can access through the website of your university library. You will need to read papers that are immediately relevant to your research project. Some of these might be suggested by your supervisor, others you might find through websites such as scholar.google.com. You can also find relevant papers by following citations. Take a paper that you have found interesting and relevant, and look through the references section. Then use scholar.google.com to find a list of articles that cite this paper. Thus, you can see both where the work in this paper has come from, and the influence that it has subsequently had.

You should, however, read more widely in your field than these papers. The point of this wider reading is to make you aware of emerging trends, methodologies, and topics in your subject, and to allow you to contextualize your own work more broadly. One strategy for this is to read regularly a couple of journals in your field. Instead of reading every article in full, they should be read in sufficient detail that you know what methodologies were used, what the findings were, and what ideas for future research the author(s) have suggested. This helps your knowledge to grow alongside your discipline, and to suggest new ideas that are not currently in use in your narrow area, but which you might be able to adopt and adapt for your research project.

You might be fortunate in that there is a single journal in your research area that contains most of the important papers in your field; find out from your supervisor early in your studies if such a journal exists. In many areas of research, however, academic publishing has grown to the extent that there are now a plethora of journals available. One alternative in some fields is blogs or social media accounts that try to track important new papers in a particular area. By following one of these, you can be alerted to a range of new papers in your area across a number of journals.

You are also advised to read the leading journal in your field, such as *Cell* in molecular biology. While the articles will not usually be of immediate relevance to your research topic, they will help you to understand the wider context for your work and alert you to emergent trends in your discipline. An alternative is to read regularly a journal that publishes tutorial and survey papers about an area, such as the *Quarterly Review of Biology* in the biological sciences.

Another method that students use to keep on top of the literature in their field is to organize a *journal club* or *reading group* in a particular area. The typical way in which these work is that a group of students (and perhaps postdoc researchers and academic staff) meet for an hour or two each week, and take it in turns to summarize and discuss a recent paper from the research literature on their topic. If there is a sufficient number of people with an interest in a particular area of the subject, then this can be a good way to get to grips with a substantial amount of the literature; if you meet every week in term time, then you will become aware of around 30 papers over the course of a year.

Acquiring doctoral skills

In the past, it was the thesis that was the most important product of so many years of study. Now, considerable emphasis is placed on the development of skills that can be used more widely after completion of your PhD. These fit into two categories: first, skills that can be applied to many areas of academic research; and second, skills that can be used in many areas of employment, including those outside the university sector. This approach

to skills development is known as the Researcher Development Framework, and arose from the 2002 Roberts report, which was the result of a government consultation on skill development and employability for PhD students (Roberts, 2002).

During your years of study and research, you will find that numerous tasks have to be undertaken in order to achieve the results you want. For example, doing a literature survey requires you to read in a focused manner, evaluating the importance and relevance of certain sections of an article or book. You then have to summarize the main points and demonstrate how they link to the topic of your thesis. This ability is something that you can use in many other life and work situations. Being able to zero in on what matters and then confidently articulate the circumstances to others is not merely a skill to be used in research alone.

The majority of successful PhD candidates do not work in universities for the whole of their career. People with communication skills of this kind will be sought after by employing organizations in both the private and public sectors. Employers offering the best in terms of job security, advancement, and opportunity are interested in talented applicants who can demonstrate these aptitudes, which might be used in such fields as consultancy and diplomacy.

Again, the need to present ideas orally and in public is vital to your success in your doctorate and to your future employment. This includes giving a seminar, presenting a paper at a conference, and of course, defending your thesis during the viva. Thus you have to develop the highly valued skills of presentation and public speaking, which can be invaluable in such careers as advertising, business and management, as well as academia – not to mention giving a speech at a wedding.

Similarly, collecting and analysing your data statistically leads to familiarity with IT programs and packages that have many applications in, for example, industry, politics, and the media. Professional standards in interviewing and questionnaire design can be used in many situations. Proficiency in a range of online technologies, in which you will have to acquire fluency during your research, are also a requirement for many jobs across the range of employment.

There are so many skills that you acquire, rather than learn, during the course of your study that add to your store of lifetime abilities. Some of these abilities, such as time management and meeting deadlines; criticizing your own work and that of your peers; and of course, maintaining a questioning attitude while being objective about your research, we discuss in considerable detail throughout this book. Others, like team-working, which includes negotiation and seeing both sides of an argument, may initially seem contradictory to the notion of the isolated researcher but you will soon discover the importance of being able to come to a decision after discussion with your supervisors, other researchers in your discipline, or conference colleagues.

You will find that it is not only the very obvious skills of composition and writing that you acquire during your course of study that will be valued by future employers. You will have many more skills to offer to corporations, most, if not all, of which have to deal with such wide-ranging issues as health and safety, product design, and marketing. And what worthwhile company does not have the need for customer service skills or thoughtful employees who can solve problems and manage challenging, complex, and fast-moving situations, such as communicating with employees during times of change or workplace conflict?

Regardless of whether you wish to pursue a career in academia or not, you will be very marketable if you make a conscious decision to develop wide-ranging abilities during your time as a postgraduate research student. It is important that you think about how to present these skills if you are applying for a job beyond academia. As a PhD student, you will become accustomed to presenting yourself very narrowly as a specialist in a particular topic, in a research area, within a discipline. This is the opposite of what is needed in other areas of employment, where a flexible portfolio of skills is often required. You can use the guidance above to present yourself and your skills more appropriately.

Developing these skills, both specific and generic, is an important part of your professional development during your PhD studies. The purpose of the exercise is to become a fully professional researcher and to be able to demonstrate that you are one. It is important to keep this professional concept in mind because it orientates everything that you have to do. For example, you are not doing research in order to do research; you are doing research in order to demonstrate that you have learned how to do research to fully professional standards (more about the implications of this later in this chapter).

You are not writing a review of your field of study because that would be an interesting thing to do, or because 'everybody does one' (although both of these may be true). You are writing a review because it gives you an opportunity to demonstrate that you have learned how to take command of the material with the maturity and grasp of the full professional (more about this in Chapter 7).

How do I know if I am meeting the standard?

Notice that the key concept is to demonstrate that your learning is to professional standards. How will you know whether it is or not? This is probably the most crucial thing that you have to learn – from your supervisors and from published work in your field. It is indeed a vital responsibility of your supervisors to ensure that you are given every opportunity to become familiar with appropriate professional standards. It is only through this familiarity that you will be able to recognize and achieve them. One useful tool is the website ethos.bl.uk, which makes available around half a million theses, free for immediate download.

One thing is clear: you cannot get a PhD unless you know what the standards are. This is because of the aims of the whole doctoral process. These are not just to allow you in due course to have the title 'Doctor', pleasant though this is and proud though your family will be. When the examiners, on behalf of the university and the academic community, award the degree and recognize you as a fully professional researcher, what they are primarily concerned with is that you should 'join the club' and continue to develop your discipline through research and scholarship if you pursue an academic career. They hope that you will publish papers from your doctoral thesis and continue to research and publish in the field to establish your academic authority, so that, in due course, you will supervise and examine other people's PhD theses.

This is in fact the aim of the whole exercise: to get you to the level where you can eventually supervise and examine others' PhDs with authority. Thus clearly you must have the necessary professional skills and you must know the standards that are required. Two immediate corollaries of this fact are:

- Quite early on in the process you must begin to read other PhD theses in your field so that you can discover what the standards are. How else will you know what to aim for?
- If you have to go along to your supervisors after you have done your work and ask if it is good enough, you are clearly not ready for a PhD, which is awarded in recognition that you are able to evaluate research work (including your own) to fully professional standards.

What can I expect to be taught during my PhD studies?

In addition to the support that you will get from your department, most universities have a graduate school, the aim of which is to support students across the university in their academic and professional development. Other names for 'graduate school' include 'researcher academy' and 'doctoral college'. Regardless of the name adopted, these bodies provide support both by organizing networking opportunities for PhD students across the university, and non-examinable short courses on relevant topics at all stages of the research. You should make yourself aware of what is available at your university.

There may be general courses on, for example,

- planning and managing your research project;
- writing in appropriate English for academic research;
- ethical guidelines for research;
- doing research online using, for example, journal and citation databases, reference management software, or online questionnaires.

There may be more courses specific to your circumstances, which may include:

- health and safety in laboratories (for science and technology students);
- using SPSS, the statistical computer package (for social science students);
- digital qualitative research methods (for humanities students);
- effective teaching (for students undertaking a tutorial role).

Within your own department, there are likely to be discipline-specific courses on the relevant research methodologies for your field, and regular seminars with visiting researchers. The possible range is considerable, and you should make full use of what your graduate school and university department offer.

As an example, one graduate school (Imperial College, London) offers a range of courses targeted at first-, second-, and third-year students. In the first year, they offer courses on project management, writing, and statistics among other topics. In the second year, courses include career planning, presentation skills for conferences, and maintaining student motivation. In the third year, the focus is on preparing for the viva, making the thesis 'open access', and writing effective CVs and applications.

There are also external courses that you could attend, often free for research students or financially supported by your university or funding body. For example, for humanities students, the British Library holds postgraduate student training days (www.bl.uk/research-collaboration/doctoral-research). For science students, the GRADschools organization offers career development training seminars (www.vitae.ac.uk/vitae-publications/vitae-researcher-development-programmes/gradschools).

Differences between the MPhil and the PhD

The MPhil (Master of Philosophy) is a less advanced qualification than the PhD, where you are expected to master a content area, which can be completed in two years' full-time study. The MPhil dissertation is normally shorter than the PhD thesis. It is often used as a training course in advanced research work. It can also be a preliminary stage for the PhD where it is necessary to learn the fundamentals of research and acquire new techniques. More often, however, the MRes is being used for this purpose.

The MPhil is also a legitimate higher degree qualification in its own right. It is easy to see the MPhil as a 'failed PhD', when it is in fact a qualification to be proud of. If the PhD is the highest mainstream academic degree, then the MPhil comes second, and represents a substantial development of skills and knowledge.

As with the PhD, it is not possible to spell out in bureaucratic detail what is required to obtain the MPhil in your subject now. You need to read successful dissertations in order to discover the standards expected. Here, but only in very general terms, are some ways in which the MPhil has been held to differ from the PhD.

- **A candidate for an MPhil must undertake an investigation but, compared with the PhD, the work may be limited in scope as well as its originality.** Considerably more emphasis is put on original work in the PhD and the PhD thesis involves greater depth than an MPhil dissertation. Greater synthesis and critical ability, as well as a more detailed investigation of any practical illustrations are expected of doctoral candidates.
- **The MPhil can be limited to the replication of research already published.** It is also acceptable for secondary sources to be used. This means that for an MPhil, it is legitimate to quote some authority quoting somebody else, for example, 'Francis gives several definitions of originality (Phillips and Pugh, 2015)'. This would not be acceptable for a PhD thesis where the candidate for the degree would be expected to have read and evaluated the original publication by Francis.
- **In addition, although a full summary of literature is required, it does not have to be an *evaluative* review as in the PhD.** The difference here is in the breadth and depth of the review as well as in the amount of critical appreciation that is expected. In a high-quality MPhil, evidence is required of the ability to test ideas; understand appropriate techniques; make use of published work and source material; and show familiarity with different theories and empirical studies. The MPhil, however, requires less critical evaluation of the literature than does a PhD.

Each university will have its own regulations concerning the MPhil degree and you must study carefully those which apply to you.

Aims of students

There are many reasons why people decide to work towards a PhD. One of the most common aims at the beginning is the wish to make a significant contribution to the chosen field. In this case, students will have become particularly interested in a topic during the course of their undergraduate degree (or perhaps while working in their profession) and wish to add something to the current state of knowledge. For example, Adam, who after graduating in architecture had spent some years both teaching and

working as an architect, explained why he had returned to university as follows:

> I wanted to do more theoretical work as my interests were with the value problems in designing a building. How does the architect make decisions about features that will affect the behaviour of those using the building without ever having a consultation with the prospective users? This interest was an extension of my direction as an undergraduate and my observations during my working career. I saw it as a serious problem and a major issue in professional practice.

Greg, a history student, said he wanted to gain a PhD because:

> It was an opportunity to continue research I had started for my MA. To me a PhD means that the candidate has made some new contribution to his field and that's really what I want to do. Up until now I've never really considered doing the next degree until I had almost finished the previous one. I don't need the PhD for my work – it might even be a disadvantage.

Greg's sentiments are not echoed by all research students, as another important aim for many postgraduates is to enhance career opportunities and future earning capacity through successful completion of the PhD degree. Some decide on this course of action when considering plans for the future. Others, like Freddy, who was studying industrial chemistry, decide on research when they find it more difficult than they had expected to get a job in industry straight from university:

> The head of department where I did my first degree offered me a research post, so I agreed after he gave me an outline of the research area.

There are other career reasons for wanting to take a doctorate. Some students feel guilty about being called 'Doctor' by people coming in to the laboratory or hospital department where they work. Others feel that relationships with their medical colleagues would be enhanced if they too had the title of 'Doctor'. Still others are embarrassed at being the only member of their academic group without a title and succumb to their feelings of needing to conform.

Another reason for undertaking a research degree after doing well at undergraduate level is simply taking up the offer of a studentship as a form of employment and without having any real career aims. And then there are those like Bradley, a student in the English department of a university, who was motivated by the intrinsic satisfaction of the work:

> I couldn't think of a more fulfilling or pleasurable way of spending my time. It's almost instinctive. I haven't weighed up the pros and cons, it was an emotional decision really.

All of these motives are far removed from the idealistic view of the PhD student as somebody dedicated to advancing knowledge and potentially worthy of becoming an undisputed expert in a given field.

As we discuss fully in Chapter 8 on the PhD process, all these students, together with very many more enthusiastic new recruits, change their way of talking about their PhD as the years of learning to do research and become a full professional pass by. Towards the end, their aims become narrower: simply to reach the goal of the PhD – 'got to get it', or else to complete an unfinished task – 'must finish'.

It is important that research students eventually realize that it is determination and application, rather than brilliance, that is needed. The sooner you learn this the better. Conducting a piece of research to a successful conclusion is a job of work that has to be done just like any other job of work. Also, just like any other job of work, an important objective should be to make a success of what you have set out to do.

Aims of supervisors

As we have seen, students study for a PhD for many different reasons. The reasons why academics might choose to participate in PhD supervision are just as varied. For some, the motivation is about collaboration – they enjoy being able to discuss and develop their topic with PhD students who share their enthusiasm for that particular area.

For others, the primary motivation is their considerable scale research ambitions. In some areas, research projects can require a large amount of human effort, such as when carrying out experiments or conducting interviews, and a supervisor cannot do all of that work alone. For such supervisors, PhD students act as research assistants on the project, carrying out fairly complex tasks but under the direct supervision and instruction of their supervisors. Such students do, of course, develop skills and knowledge in their area of research, but this is in the context of a larger research programme set by the supervisor. This style of supervision also has the advantage that you will often be surrounded by other PhD students working on the same broad research programme, and so will have more opportunities to discuss ideas and learn skills from one another.

Another motivation for supervision is mentoring a new generation of researchers. Such supervisors will view their students as broadly independent researchers, and will see their own role as providing advice and guidance, rather than setting the direction of the research or actively collaborating on it. They see their role as supporting the development of their students towards increased independence. Often, such supervisors will encourage their students towards a similar career direction as themselves, and those who have one or more former research students who are

now professors speak of the achievements of these postgraduates with great pride.

These are not exclusive categories. Many supervisors may be motivated by a mixture of the above. Furthermore, these motivations may change across the course of the PhD. Some supervisors tend to encourage a very collaborative way of working during the early years of the PhD, but might then try to move their students towards independent thought later on. If you are not aware that these changes are happening, this can be problematic. For example, your supervisors might be trying to encourage you towards independence of thought by having less frequent meetings; if this is not clear to you, this might come across instead as the supervisors losing interest in your work.

Alongside these more noble motives, supervisors may be driven by other, baser aspirations, such as the need to be seen as an active and successful supervisor for promotion to a higher grade job, or to burnish their own reputation by supervising students who go on to have academic careers.

You should care about your supervisors' motivations because this can influence their style of supervision and their expectations for you. If you have chosen a somewhat idiosyncratic topic, you would not want to be paired with a supervisor who sees you as their research assistant. If you want lots of direction, then you will not get along with a supervisor who is constantly pushing you towards independence (although of course every PhD student will eventually need to produce their own, independent, original work). They may also vary in their ambitions for you. If you do not plan on an academic career after completing your PhD, then being paired with supervisors who cannot imagine such an outcome is not a good match. Even a mismatch in approach within a subject can have huge consequences. For example, if you are motivated by a theoretical approach, and your supervisors only see value in an experimental one, then you will not be able to develop a happy working relationship.

Understanding these differences in motivation is an important part of both the application process and the early stages of your PhD study, and can make the difference between success and failure. A good starting point is to ask supervisors how their previous students chose their topics. When talking to existing PhD students, you should aim to introduce this into the conversation.

Aims of examiners

External examiners are academics from universities other than your own whose task is to ensure that, within a given discipline, standards of quality for which the PhD degree is awarded are uniform across universities. Some

examiners see the aims of the PhD to be a training for a career in research, some as an introduction to writing books, some as preparation for the academic life, and some, as we have suggested, to become a fully rounded professional.

Whether examiners are more interested in the research, the thesis or the performance of the candidate in the oral examination, they are looking for a command of the subject area (or context) of the research, as well as the specific topic. The British PhD is awarded for an original contribution to knowledge. Yet, as we shall see in Chapter 5, originality in the PhD is a complex concept, which is yet to be adequately defined. Nevertheless, examiners need to be satisfied that the work has a degree of originality and that it is the genuine work of the candidate.

Examiners acquire reputations for their performance in this role. Some become known as difficult to please, while others are prepared to take the supervisor's evaluation of the work almost without question. Some examiners make the oral examination a real test of professional knowledge and exposition, while others allow it to be more of a relaxed conversation between friends.

The reputations that the examiners acquire do sometimes affect their selection, especially when it is left to the supervisor to choose. Some candidates find that their external examiners have been chosen on the basis of how highly their supervisors regard their students' work. For example, if a supervisor thinks that a particular student will only just satisfy requirements, a less exacting examiner may be chosen. If, on the other hand, the supervisor considers the student's work to be of considerable merit, a tough examiner is chosen and the student then has the advantage of being passed by somebody who adds prestige to the award of their PhD. However, such a system is far from universal and can be extremely unpopular. Dr George, a supervisor who also has special responsibility for research students in his department said: 'I'm against the practice of getting a lesser academic, or a friend, for a weaker student but I know it happens and it has happened here'.

Aims of universities and research funders

Government funding for studentships comes mainly from UK Research and Innovation, in the form of grants to universities that they then distribute to students. In some areas, substantial funding comes from research charities. In the past, a fairly relaxed view was taken when evaluating what happened after a studentship had been awarded, considering this a matter for the academic discretion of the particular department and supervisors involved, but this is no longer the case. Nowadays, completing your PhD will be even more important to your university, because continued funding

to the institution might be dependent on the number of successful PhD candidates.

The most common way of not being successful is to drop out – very few people actually fail. The historically high drop-out rate of students has led funders in the past to require universities to demonstrate that they have an effective student support system in place. They have issued guidelines on what is good practice in matters such as induction sessions for new students, research environments, supervisory arrangements, and appeals and complaints procedures. They have issued league tables of completion rates and universities who do not perform satisfactorily run the risk of not receiving research student grants. Such universities can apply for reinstatement if they are able to demonstrate that their support arrangements have improved.

The effect of these policies has been to make academic institutions much more concerned to control the education that takes place during the PhD to ensure that it is of high quality. They have reviewed their supervisory practices, established doctoral programmes, strengthened the procedures for monitoring the progress of research students, and so on. Academics with overall departmental responsibility for doctoral students have been appointed. This book itself is an illustration of the way in which attempts are continually being made to make the doctoral educational process more effective.

Another approach that funders have taken to try to provide more support and focus for PhD students is to fund doctoral training centres. These centres, which we have discussed in more detail in Chapter 2, take on a large number of students in one field of study at a single university or small consortium. The primary motivation of funding these is to improve the quality of education, by ensuring that students have more opportunities to interact with each other and to learn from courses and research seminars, and furthermore to be less likely to drop out due to the increased support available.

The aim of funders is to get a high proportion of full-time doctoral students to complete within four years, and universities work to bring this about. The criterion of a successful completion for these purposes is defined as: the submission of the thesis for first examination four years after registration as a full-time student. Any referral as a result of the examination is not taken into account.

From the student's point of view, the positive effects are that a great deal more interest and care is being devoted to making the process work efficiently, and you should make sure that you reap the benefits of these developments. A possible negative effect is that you may be forced to take a narrower view of your research than you might like in order to complete within the stated time. Remember, though, there will be opportunities for further research on related issues after you have obtained your PhD.

Mismatches and problems

Once we begin to acknowledge that the aims of the different groups involved with the PhD are not wholly congruent, it is not too big a step to realize that certain conflicts are inherent in the system.

For example, if a student who wishes to develop an area of research and make a significant contribution to it is paired with a leading supervisor who is more interested in speedy problem-solving, both will inevitably feel frustrated. Diana, a biochemistry postgrad, started by looking for 'the truth' and spending a lot of time working on important experiments even though they would not form part of her thesis. At this stage her lead supervisor, Professor Drake, whose concern was focused on findings, showed little interest and tended to leave her alone for long periods. He became more interested in her work when she began 'churning out results'. Once this happened, quite far into her registration period, she said: 'My change of attitude means that instead of experimenting for the sake of getting answers, I'm now experimenting in order to get graphs that can be published'. This was more satisfying for Professor Drake than for Diana.

By contrast, where a student is more interested in obtaining answers and the leading supervisor wants to develop an area of research, it will not be long before they both become irritated with the situation. Such was the case with Freddy and Professor Forsdike:

> I intend to tell the Prof. that he has to have very good justification for my working after the 31st March. It has to be something vital and important. All the poisoning work was never in the original project outline and most of the additional experimental work he gives me is quite irrelevant to my thesis.

Here the supervisor is encouraging the student to go beyond the boundaries of his thesis problem and pursue the leads that result from the original experiments. The student, however, wants no more than to complete a bounded series of experiments and write them up for a PhD.

If a supervisor is interested in discussing new ideas and exploring untested areas but is responsible merely for ensuring that the student completes a thesis of the required standard in a reasonable amount of time, the work of supervision becomes less than satisfying. Mrs Briggs, a supervisor in the Arts faculty of a university, was disenchanted with the university's perception of what a PhD had come to mean compared to the more relaxed and longer time-scales before pressures for completion became the norm. She was very much enjoying supervising a postgraduate of whom she said:

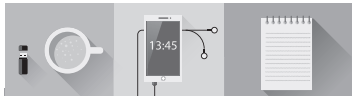
> He's always telling me things I don't know and that's exciting – except, of course, I can't know whether the things he's telling me are accurate.

> I try to make up to him for not being an ideal supervisor by giving him enthusiasm. He knows I think that he's interesting. I don't want to let him down – he's such a very good research student. I introduce him to others in the field who *are* experts, and then he can approach them at any time he wishes for more specialist knowledge. He should finish the PhD in three years. He says it's a life's work, and I agree that it could easily be, but the PhD is not a life's work and he must finish it quickly.

This supervisor is admitting that supervision can be of benefit to the supervisor herself, and this is quite commonly the case. Indeed, supervisors can expect their students to be able to introduce them to new developments within the field of their thesis topic, and equally they must accept that they are not the only source of academic knowledge and professional skill for the student. Another benefit to supervisors nowadays is to record the number of PhDs they have supervised to successful completion on their CVs.

These cases show the kinds of juggling that have to occur between defining the boundaries of the research and managing the time available for writing the thesis. Whether it is the student or the supervisor who takes the main responsibility for this does not alter the fact that decisions regarding what is appropriate, relevant, and necessary have to be made throughout the student's period of registration.

Chapter 4



How not to get a PhD

Action summary

1 Be aware of the nine ways of not getting a PhD:
   - not wanting a PhD;
   - overestimating what is required;
   - underestimating what is required;
   - having a supervisor who does not know what is required;
   - losing contact with your supervisor;
   - not being in a research environment
   - not having a 'thesis' (as in position or argument) to maintain;
   - copying someone else's work, or making up results;
   - taking a completely different job before submitting.
2 Work to understand the implications of these traps fully in your own situation and determine not to succumb to them.
3 Avoid temptations to stray from your programme of work.

We want now to examine some very well-established ways of *not* getting a PhD. These tried-and-tested ways of failing apply to all fields and have to be pondered continually by research students. You have to be clear what your position is regarding each of the nine ways of failing listed above if you are not to fall into the traps they offer. As we shall see, just having them pointed out to you is not enough. Most offer real temptations that have to be determinedly resisted.

Not wanting a PhD

The first method of not getting a PhD is not to *want* one! This may seem very strange, considering that you may well be living on a pittance from studentships, loans or family support, and may well have given up a job in

order to get through the course. At the very least, you will be devoting a great deal of time, effort, and energy to research. Surely, you might say, considering what I am giving up to the project, can there be any doubt that I really want a PhD?

Strangely enough, there can be. We think an analogy would help here. It is the case, we believe, that none of us, research students and research supervisors alike, sets out to become a millionaire. It would be very nice, of course, if someone were to give us a million pounds and not do anything for it, not even buy a lottery ticket. But we don't *set out* to become millionaires. Clearly so, otherwise we wouldn't be undertaking research or working to get a PhD; instead, we would be trying to build a better mousetrap, to invent an innovative app to play the property market, to write a best-selling novel. There are many ways of making a million pounds, but doing a PhD is unlikely to be one of them.

Exactly the same phenomenon happens with PhDs. If someone thinks it would be a nice idea to do a PhD, have an idea as to what they want to do and then say, 'Please can I have a PhD for it?', the likely answer will be 'No'. PhDs are awarded for a particular form and level of research activity (which we shall discuss in Chapters 5 and 7), and if you are not *committed* to this, then you effectively do not want to do a PhD. It is precisely the same distinction as that between hoping to become a millionaire and setting out to make a million pounds.

The purpose of this book is to help you to obtain a PhD, and for this you need a level of single-mindedness, a willingness to discover what is realistically required, and a determination to carry it out. This is the mindset required for wanting a PhD, and this 'wanting' is important in that it has to work very hard for you. For example, it has to get you through those occasions when what you are doing seems pointless or fruitless, or when you ask yourself the question, 'Why have I got myself into this?' or 'Why am I inflicting this on my family?' You cannot expect with an activity as demanding as studying for a PhD that the intrinsic satisfaction you have (such as your interest in doing the research, the enjoyment of discussing your subject with other like-minded researchers) will be sufficient on its own to carry you through. You must always have a clear eye on the extrinsic satisfaction also – your commitment to the whole idea of doing a PhD, its necessary place in your career progression, and so on; you must *really* want to do it.

There are, unfortunately, beginning doctoral candidates who do not want to do a PhD in this sense. Particularly vulnerable are those who lack clear career goals and those who are using the PhD process as a vehicle for a career change:

> Jaswinder was very intelligent and sailed through his undergraduate degree course in biochemistry. He spent a good deal of his time on student union affairs and was very involved in Green Party issues. In spite

of this, with intense revision in the two weeks before each year's exams, he got an upper second in his finals. He was delighted to be offered a research studentship in the department, which allowed him to research a topic in the chemistry of reduction of organic residues. But he did not cut down on his outside commitments to campaigning on green issues, seeing them as highly relevant to the ''political' aspects of his research. When he first presented useful ideas that he might study, Dr Jacobs, his lead supervisor, was impressed and she encouraged him to develop a research design. But it became clear that he was more interested in sketching out the ideas than in buckling down to designing a viable research study and carrying it out. When challenged, he always came up with a new and better suggestion for the research and promised to develop it. He carried on like this right until the end of his first year, when Dr Jacobs indicated forcefully to him that she considered he did not have any chance at all of obtaining a PhD unless he gave up all his outside activities and concentrated on his research work. Unless he did this, she was not prepared to support the second year of his grant. Jaswinder was nonplussed by this ultimatum, as he had always considered extracurricular activity to be an indispensable part of student life. At this time he had the opportunity to work full-time for a period on a Green political campaign, and he left the university to pursue this activity.

Ilana, a teacher for many years, developed an interest in a particular specialism (multi-ethnic curriculum development) and thought she would like to do research in order to establish herself in this new subject. She found that doing research was taking her further and further away from dealing with what she saw as the real issues of pupils in the classroom in favour of a measurement-orientated form of ''science' to which she was unsympathetic. She left and returned to teaching.

Not understanding the nature of a PhD by overestimating what is required

The words used to describe the outcome of a PhD project – 'an original contribution to knowledge' – may sound rather grand, but you must remember that, as we saw in Chapter 3, the work for the degree is essentially a *research training* process and the term 'original contribution' has perforce to be interpreted quite narrowly. It does not mean an enormous breakthrough that has the subject rocking on its foundations, and research students who think that it does (even if only subconsciously or in a half-formed way) will find the process pretty debilitating.

Of course, if you are capable of a major contribution, then go ahead and make it. There are still, for example, a few engineers who are Fellows of the

Royal Society but do not have a PhD, but this is a strategy for getting an honorary degree, not for getting a PhD! For those not in that position – that is, most of us – an original contribution can be rather limited in its scope and indeed should be: apply this theory in a different setting, evaluate the effects of raising the temperature, solve this puzzling oddity or review this little-known historical event. In Chapter 5, we give a detailed discussion of the concept of originality in relation to the PhD.

We find that when we make this point, some social science students who have read Kuhn's (1970) work on 'paradigm shifts' in the history of natural science (science students have normally not heard of him) say rather indignantly, 'Oh, do you mean a PhD has to be just doing normal science?' And indeed we do mean that. Paradigm shifts are major changes in the explanatory schemes of the science, which happen only rarely when the inadequacies of the previous framework have become more and more limiting. Normal science is the ordinary research that goes on between major theoretical changes. It serves to elaborate the general explanatory paradigm used and to tease out difficulties and puzzles that are not yet sufficiently well explained. It is the basic useful activity of scientists and scholars, and PhD students should be pleased to make a contribution to it.

You can leave the paradigm shifts for *after* your PhD, and empirically that is indeed what happens. The theory of relativity (a classic example of a paradigm shift in relation to post-Newtonian physics) was not Einstein's PhD thesis (that was a sensible contribution to Brownian motion theory). *Das Kapital* was not Marx's PhD (his was on the theories of two little known Greek philosophers). Of course, while doing their PhDs, Einstein and Marx were undoubtedly preparing themselves for the great questionings that led to the big shifts, but they were also demonstrating their fully professional mastery of the established paradigms.

As we saw in Chapter 3, it is this professionalism that the PhD is about. To think it is more than that can be very debilitating. You can wait for a long time for a new paradigm to strike. Overestimating is a powerful way of not getting a PhD. Here are two classic cases:

> Bob insisted that it would not be 'real' research if he read up in books and journals what others had done on the problem that he wished to tackle; his thinking would be entirely shaped by what they had done and he would only be able to add something minor. He felt that his only chance of being really innovative was not to read anything further in the field (he had a bachelor's and a relevant master's degree in the subject) but to design an investigation into the problem he was proposing to research (concerned with adult learning of skills), which he knew well from a practical point of view as an industrial trainer. This took quite a long time, as his knowledge of research methods was not that strong.
>
> When he did present his proposal to his supervisors, Dr Bishop, his second supervisor, was not impressed. She was on the supervisory team

for her methodological expertise, and as this field was not her own particular speciality, she looked up all the current year's issues of the relevant journals. In one of them she found a paper reporting a study on Bob's topic that (not surprisingly, since it was completed and published) was considerably better than Bob's attempt. She used this paper to support her argument that he would have to make a comprehensive search of relevant published material if he were to have a chance of designing an adequate study which would make a contribution. But Bob saw this as a negation of what he wanted to do and withdrew.

While Paweł was carrying out the fieldwork stage of his research into the motivation of managers, he became very involved with his subjects. He felt that it would be a betrayal if they were to get no benefit from his research because it was written up in a dull academic book that no one would read. Most research was like that, Paweł maintained, and was therefore neglected by everyone except the next lot of researchers. What was needed was a research report that could really communicate. Why couldn't we have a PhD thesis that would read like a novel so that it would become accessible?

Paweł took this idea very seriously. He wrote to a novelist whose works he admired for some suggestions on how to write his thesis. He took an extra year to write up the material, letting no one see anything on the way, on the grounds that you don't show a novel to anyone until it is completed. When he did finally present his complete thesis, his supervisors thought it was inadequate, not rigorous and indulgently subjective. They asked Paweł to rewrite it, but he refused and thus did not get a PhD.

We hasten to emphasize that the latter example is not intended to deprecate writing research results for lay people, a very necessary activity that all researchers should take seriously. It is about overestimating what can be done with a PhD and therefore falling flat on your face. Nor does it mean that in writing for your academic peers you should neglect clear expression and interesting presentation – as we discuss in Chapter 7.

Not understanding the nature of a PhD by underestimating what is required

Underestimating is always a problem if not corrected, but is particularly damaging in two situations.

First, it is a problem for those researching part-time and continuing in their jobs, or for those coming back to academic life after a long period in the 'real world' as they would see it. It is basically a difficulty of understanding

what is meant by 'research', since the word is used much more strictly in the academic than in the non-academic sphere. We shall discuss the nature of research activity in Chapter 5, but here we simply note that the layperson's view that 'research is finding out something you don't know' is not adequate, that most of the activities described as 'market research' or 'research for a TV programme' do not fulfil the criteria of research required for a PhD.

PhD research requires a contribution to the analysis and explanation of the topic, not just description. It requires an understanding that it is as important a part of the research process to fashion the questions properly as it is to develop interesting answers. It is an underestimation of what is required to accept a lay formulation of either questions or answers – even if they somehow appear more relevant – and it is a clear way of not getting a PhD. Here is an example:

> Chris was a financial manager who thought that a research degree would be a good insurance should he wish in the future to become a management lecturer, and so he enrolled part-time for a PhD degree. He wanted to do his research on the financial control systems of his firm, about which he naturally knew a very great deal. He thought that it would be easy to do some research into a topic on which he was one of the experts, but he seriously underestimated the fact that research means finding good questions as well as good answers.
>
> Chris was not able to formulate research questions very well himself. When Dr Clapp, his lead supervisor, began suggesting a number of questions that he might investigate, Chris would take them up enthusiastically in discussion and give 'the answer' as he knew it to be. After treating a series of possible topics in this way, it became clear that he really did not have any need to do research since he knew all the answers anyway – at least at a level that satisfied him. After Dr Clapp impressed on him that research requires actively challenging old explanations and finding new ones if necessary, his enthusiasm waned and he dropped out.

The second form of underestimating is particularly a problem for science students working in a lab and contributing a project as part of a bigger research programme. Here, the programme director, typically also the lead supervisor, is very keen to get the results of the students' experiments in order to push the programme forward. Students are very happy to feel that they are contributing. But the danger is that they are not exercising the full range of professional skills required to be demonstrated in the PhD. These are spelled out in Chapter 7 on the form of the PhD thesis and include, in addition to carrying out the actual experiment, the design of the investigation, the analysis of the results, and the writing up of the results into a thesis. To obtain the PhD, students have to show they are capable of all these activities; to miss out on any of them is to underestimate what is required.

Gary's project was part of a research programme in plasma physics. He worked hard to collect the data that he had agreed with his supervisors were needed for his PhD. His programme director, Professor Ganesh, was very interested in the results and on several occasions took the material and wrote it up for a conference paper. Gary was pleased with this and felt he was making a contribution on the data side. But it meant that he had no writing practice beyond completing his lab reports. In his final year Gary was faced with a pile of records and had to do his own writing. On the first occasion that he tried, he sat with a blank sheet of paper in front of him but did not manage to write anything. After half an hour, he went back to the data because he felt more comfortable tidying up the records. He tried sitting down to write on several more occasions, with no more than a few pages to show for it. He cheered up when Professor Ganesh suggested another piece of empirical work that he could do, and he busied himself in carrying it out.

The writing work still had to be done, however, and the PhD registration period was running out. Professor Ganesh was sympathetic to Gary's predicament. To show him how to do it, the professor took an inadequate draft of Gary's and wrote up a section that could go straight into Gary's PhD. But he pointed out that he could not write the thesis *for* Gary, who now had to do it himself.

Not having a supervisor who knows what a PhD requires

If it is important for a student not to over- or underestimate the nature of a PhD, it is equally important to have a supervisor who does not do so; we shall be discussing issues of supervision in detail in Chapters 6 and 11. Here we will just point out that first, inadequate supervision is a major cause of not getting a PhD and second, since the penalties to students of not succeeding are much greater than to their supervisors, in the end it is up to determined students to get the supervision they need and are entitled to.

Supervisors may under- or overestimate what is required. One key cause of underestimation is lack of research experience on the part of supervisors. In our view, the most important single characteristic of effective supervisors is that of being involved themselves in ongoing research and publication. They can thus give advice from current knowledge of the field, and can act as role models through their own practice. Otherwise problems will arise.

Sophia came to Britain on a government scholarship from a country that has little tradition of empirical research in her field. She was allocated to a supervisor who had good practical experience but who had not in fact done any research himself. She worked away by herself, with occasional comments from him that he thought a particular section very interesting.

> But he had badly underestimated the nature of a PhD. When she submitted her thesis the external examiner said that, in his opinion, it was so completely inadequate that there was no point in having the oral examination or in allowing a resubmission. She returned to her country in debt, sadder and wiser.

Sophia's case points up not only the problem of inadequate supervision, but also the problem that she was not aware of the deficiencies under which she was working. As we discuss in Chapter 9, these are issues that international students may find more difficult to cope with. All students, however, must ensure that they discuss their work with several academics and with their peers, and that they regularly read accepted PhD theses in their field to discover the standards that are required.

Supervisors who overestimate, often with the best of intentions, are also a problem.

> Professor Shepherd is a supervisor very few of whose students finish their PhDs. This is surprising, because he is a well-known academic in his field, has a lively intelligence and an outgoing personality – which is why he continues to attract students to supervise. But Professor Shepherd believes in treating research students as adults, as he puts it, forgetting that students are babes in research terms. He believes that it is the supervisor's job to challenge his students, to shake them up mentally, to bombard them with new ideas. He goes on doing this throughout the duration of the research, even when more convergence, more limitations are required to complete the study. Because of this overestimation, many students find they have taken on too large a project, which they do not see becoming more focused. They get disheartened and drop out.

Losing contact with your supervisor

As we said above, the penalties of failure are greater for the student than for the supervisor. The relationship is not one of equality, so the student has to work harder to keep in touch with the supervisory panel than the other way around. As we discuss in Chapter 8, the nature of the PhD process requires continual input from supervisors if the student is to learn the skills of doing research and how to apply it to the particular topic under study. The details of managing this interaction fruitfully on both sides are covered in Chapters 6 and 11. Let us illustrate here the inevitable catastrophic effects which result if contact is lost.

> Tony got bogged down 18 months into his project. After a long session with his lead supervisor he decided that he wanted to change direction.

His supervisor said that it was impossible to do so at this stage and he should carry on – even though it was now clear that more work would be required than originally envisaged, with a weaker outcome anyway. Tony did not agree and tried to persuade his supervisor to allow greater modifications. His supervisor explained that this was not sensible within the available time-scale, and pressed him to carry on with the original design. They saw each other less and less because Tony felt that they were talking at cross-purposes. After four months they ceased to have any meetings; after six months Tony was observed rushing into a lecture room to avoid his supervisor whom he saw coming towards him along the corridor. He never submitted his thesis.

Doron's supervisor, Professor Dickinson, was one of the leading academics in Britain in her field. She died tragically when Doron was at the end of his second year. His supervision was taken over by an experienced researcher whose range of concerns was different and who had only a general interest in Doron's topic. Doron did not think it necessary to tell his new supervisor in any detail what he was doing, having it clear in his mind that Professor Dickinson would have given her approval. He thus worked without supervision for a further 18 months. When he came to submit his thesis the examiners felt that he had suffered from lack of supervision, which in the circumstances should be taken into account, but that they could award him only an MPhil, not a PhD. He appealed, but in due course the university confirmed the decision.

Doron's enforced change of supervisor was due to a particularly tragic event. Supervisors leave for happier reasons too, and often it is necessary to be handed on to another supervisor and for the supervisory team to be reconstituted. In these circumstances, it is particularly incumbent on the student to make good contact with the new team, whose knowledge and skills will make a crucial contribution to getting a PhD.

Sometimes supervisors leave their universities for another job, they may even leave the country or, unfortunately, die. In such cases, it is up to the University to make sure that the student is allocated an appropriate new supervisor. If the original supervisor merely changes job, they may take responsibility for the student and still arrange occasional meetings, although this is not a requirement.

Not being in a research environment

A research environment is one in which intellectual exploration is highly valued. Its members carry out research, and regular 'talk around the water

cooler' is not only about last night's TV, but also about the exciting academic paper that a colleague came across online.

Research students gain two distinct, but equally important, benefits from being part of such a milieu. The first is motivational. Being surrounded by colleagues, both senior and junior, for whom research is an ongoing prized part of their lives is the ideal way to internalize the values of academia and learn the need to press on, complete the work, obtain the PhD degree, and publish papers to make a contribution to the field.

The second benefit comes from the tacit learning that takes place in this atmosphere. Seeing experienced researchers struggle with the problems of designing a 'do-able' empirical study, obtaining reliable and valid data, interpreting results, drafting papers, and so on gives important insights to the beginner and introduces 'tricks of the trade' that would be hard to obtain by reading books.

Unfortunately, not all doctoral students operate in such a setting, and this can hamper their progress.

> Kevin was recruited on a postgraduate grant in a university which was formerly a college of higher education. The grant was obtained by the Deputy Head of the Education Department, Mr Kemp, who wanted a study of the processes of adjustment of new students. Because of the lack of research experience in the University, it was also agreed that Kevin would register as an external PhD student at a university in the nearest city, about 25 miles away, and that Mr Kemp would be his external supervisor. Kevin found it very difficult to get ideas about how to design his study. Mr Kemp had many thoughts about the processes he was interested in having studied, but knew little about the requirements of designing an academic study for a PhD. On two occasions Kevin visited the university where he was registered to discuss ideas of designing the project with his internal supervisor. On his return he tried to discuss these ideas, but was surprised and discouraged to find that Mr Kemp was rather resentful that someone else could get involved with the work.
>
> Another time Kevin went to a research conference, and was excited about some of the studies presented there. But when he returned, as Mr Kemp was busy on administrative and teaching duties, it took two weeks before Kevin could get an appointment to see him, by which time his enthusiasm had inevitably cooled.
>
> Kevin completed the two years of his grant by writing the first draft of a report to the funding body, which Mr Kemp amended, expanded and submitted. It was filed away as these things often are. Kevin never managed to design a study that was accepted as an adequate basis for PhD research.

This example is an extreme case of a lack of an environment in which research is encouraged, and most universities do make greater efforts to

provide doctoral student support. But even within traditional universities, there is considerable variation in the richness of the research environment. All doctoral students need to take a hard look at the situation in which they are operating and ask themselves whether they are benefiting from interacting regularly with motivated, experienced researchers. If necessary they must work to increase that interaction by going to seminars and conferences and looking for further opportunities to meet researchers in their field. The benefits are considerable. The lonely, single researcher has a much harder path to reach the PhD and the chances of success are reduced.

Not having a thesis

Words develop in meaning, and the word 'thesis' is nowadays commonly used to refer to the project report of the research undertaken for the PhD. Thus the regulations of your university may say that your thesis may be not more than a certain number of words in length, that it must be presented in black/blue/red binding, and so on. (Incidentally, these regulations differ between institutions and they also change over time, so it is important for you to check those that apply to you – see Chapter 10.)

But there is an earlier use of the word 'thesis' that is very important to the task of obtaining a PhD. A thesis in this sense is something that you wish to argue, a *position* that you wish to maintain (the word 'thesis' derives from the Greek for 'place'). For example, the Protestant Reformation of Christianity began in 1517 when Martin Luther nailed a list of 95 theses to the door of Wittenberg church – statements of his beliefs, which he wished to maintain against the Roman Church of that time. C.P. Snow (1959) propounded the thesis that British intellectuals inhabit two separate cultures – literary and scientific – which hardly overlap. It is *our* thesis that it is crucial for students wanting to obtain a PhD that they understand fully the objectives of the exercise and the nature of the processes involved, which is why we have written this book.

Your PhD must have a thesis in this sense. It must argue a position. At the minimum, this means that the study must have a 'storyline', a coherent thrust that pushes along an argument, an explanation, a systematic set of inferences derived from new data or new ways of viewing current data. Often when trying to come to grips with the tough-minded pruning of material that this involves, you will feel that you are losing useful data or important points. Relevance to the argument is the stern criterion, however. Your thesis has to organize data to increase the richness of your work and focus argument to increase its cogency. It is not enough for your thesis report to be 'a short trot with a cultured mind' (Campbell, 1950).

It may be that the thesis you are arguing has been decomposed into a number of 'hypo-theses' (hypotheses), each of which will be tested for its

adequacy. In this case, you must relate them to each other to maintain the general thrust of your argument. If you are not working in the hypothesis-testing mode, you must still ensure that your discussions add up to a coherent argument. This is how the adequacy of your contribution is judged. As with all the other ways of not getting a PhD, this is easier to say than to do. If you do not have good guidance in the early stages of your research, you may be tempted to spread yourself too widely and too thinly.

> Harry started out to study factors affecting industrial marketing strategies. This is a large field and he was able to tackle the issues only rather superficially. Some of the chapters in his thesis report made some good points, others were rather poor, but none of the aspects was at all related to the others in a cumulative way. The examiners said that his thesis 'did not add up to anything' and rejected it.

> Graham was the administrator of a voluntary organization. He registered for a PhD because he felt that not enough was known about how to manage such organizations; more research was needed to make administrators in this field more professional. He spent his first year reading a great deal about administration and thinking how the ideas could be applied to help administrators in voluntary organizations. When he was asked how his research could help them, he said that he wanted to write a textbook describing good administrative practices. There then followed a long period of trying to get through to him that without a thesis his work would not earn a PhD, though it might well be a useful project to do in itself. In the end he reluctantly accepted this.

We must emphasize that it is not the notion of a textbook *per se* that makes it inadequate for a PhD but the lack of a thesis. A textbook that incorporated a well-argued, justified thesis – for example, that accepted views are inadequate when the data are critically re-examined, or that the field can be reinterpreted fruitfully in the light of a new theory – would be very acceptable.

Copying someone else's work, or making up results

Each year, a number of students are caught having committed serious acts of academic misconduct as part of their PhD submission. Some have plagiarized sections of their thesis from published work, or from other completed PhD theses. Others have invented results from experiments, or made up quotations that they claim come from study participants. Obviously, such actions are utterly unacceptable. Our impression is that these actions usually arise out of desperation rather than calculated fraud. A student will reach a point where their experiments are just not working, or where they

are running out of time to submit, and it seems to them that cheating is the only alternative. If you feel that you are in this situation, you must talk to your supervisors and get advice how to proceed.

For example, you might ask for help on how to present a careful analysis of some negative results, which can be just as acceptable as positive results. Universities would prefer that you took a few more months to complete your PhD honestly rather than copy material from others.

Other forms of dishonesty are more subtle, yet equally unacceptable. Many students feel that they cannot express a particular thought in the way that they would like, and so 'borrow' a few sentences from elsewhere without attribution. Soon the thesis becomes a patchwork of other people's ideas. Remember that a PhD thesis is *evidence* that you understand the topic and have made an original contribution to it. By taking the shortcut of patching together other people's writing, you soon end up with a piece of work that doesn't give the examiners the evidence they need to show that you understand.

You may be contacted by companies that offer to help you with your PhD work, for a hefty fee. At the most extreme, these support blatant fraud, by writing your thesis for you. Clearly, using such a service is unacceptable, and if you are caught doing so (which will be inevitable, at the viva, if not before) you will suffer negative consequences that may well stretch beyond your PhD years. More subtle are services that offer 'proofreading'. This can easily stretch into having someone re-write your thesis, and so is also unacceptable. Remember that you are being assessed not just on your ability to do the work, but to present the work in high-quality academic English.

Another more subtle form of dishonesty is presenting a selective set of results, so as to make your work look positive. Clearly, a PhD thesis is not a diary, and you can choose what material you put in the thesis. Nonetheless, if your claim to originality is, say, that you have invented a new statistical method for some task, and you try it on twenty datasets and only include the ten datasets where it performed better than the existing method, then you are giving a distorted view of your work. You must guard against this, and seek your supervisor's advice about how to select material for your thesis.

Taking a completely different job before finishing

Doing a PhD is an intellectually demanding enterprise, and this is true at all stages of the work. It is especially true in the final stages where you are concentrating on writing. Most students radically underestimate the amount of time and effort that this stage will require. They somehow think that having surveyed the field, designed the study, collected and analysed the data, it is downhill from then on to the presentation of the thesis. It is

not so. Final writing up demands the most concentrated effort of the whole process.

There are a number of reasons for this. The first is emotional: it is difficult to avoid feeling that this is a chore, after the 'real' work has been done. There are always ambivalent feelings about the study itself and a barely suppressed desire to run away from it all, now that the data are actually there for others to see. The second reason is intellectual: unless you are extremely lucky and everything turns out exactly as planned, there will still be quite a lot of adjustment needed in your argument, in your interpretation, in your presentation, to put the best face on the material you have available. This is an extremely demanding test of professional competence, and it is in fact at this stage that you have really to demonstrate that you are worth a PhD.

There is a third reason concerned with limitations in writing skill and experience. Few students have written anything as long as a PhD thesis before, and to complete it requires considerable effort, skill, and organization, as we discuss in Chapter 7.

For these reasons, it is important that you try to keep your personal situation and your other commitments stable until you have submitted. In particular, taking a new full-time job, in a different part of the country or in a different country entirely, can be a barrier to successful completion. Apart from the physical dislocation, which makes intellectual work difficult and therefore easily postponed, a new job is likely to require you to concentrate your attention on a different range of issues, which, particularly if they are academic ones, will inevitably get in the way of writing owing to intellectual fatigue.

> Martin, in his late thirties, felt trapped in his job and was desperately looking for a way out which would lead to a new career. He decided to register as a full-time research student and live on a scholarship together with his wife's earnings. But at the end of the second year he felt he could no longer stand the strain of the financial hardship. In spite of dire warnings from his supervisors, he took a job in industry that involved a move to another part of the country and switched to part-time registration for his PhD. He fully intended to carry on writing up his research results, but found it increasingly difficult to find the time to do the work or meet his supervisors. His registration time ran out and he did not submit.

It is very likely that you will need to work to support yourself during this final stage. We advise that, where possible, you continue with work that you have done before. This could be work in the university environment, such as seminar teaching or laboratory demonstrating. Alternatively, it might be a part-time job that provides a contrast to the intellectual rigours of PhD work. It could even be one where your experience means that you

do not need large intellectual set-up costs to be effective. An intellectually demanding job, even if part-time in nature, will spill over into research thinking time, and use up more intellectual effort than represented by the number of hours.

Balancing this stage of intense writing against family commitments can be another challenge. This is particularly the case if you are working from home, and you may need to explain the need for uninterrupted writing time to your children, partner or parents. Also, universities now recognize the importance of maternity/paternity leave and support for carers to be available during this final stage and, if needed, you should investigate this.

A number of people, through a mixture of extreme determination and advantageous circumstances, manage to complete the degree whilst taking a new job:

> Madeleine's research studentship lasted for only two years, not the usual three, because she had previously received a research council grant on another project. She was coming to the end of her grant when she applied for and was appointed to a lectureship in a neighbouring university. In spite of the fact that her Head of Department offered her a six-month extension on her studentship from the Department's own resources, she felt that the offer of a lectureship was one she could not refuse. She took it and worked very hard on both launching new lecture courses and completing her degree part-time.
>
> She had three important advantages compared to Martin: (i) the new university was quite near her original one so she could maintain unbroken contact with her supervisors; (ii) she was able to arrange to have every Friday free to return to her original university to work on the analysis of her data in a research environment without interruption from her teaching responsibilities; and (iii) she was able to build one of her courses around her field of research, thus reducing the impact of intellectual fatigue. It was still a considerable effort, but she achieved her goals of gaining a PhD and establishing herself in a lectureship.

Finally, on this topic, remember that, rather confusingly, the terms 'thesis' and 'dissertation' are used in different ways in different parts of the world. In the US, master's students write 'theses' whereas in Australia and Britain they write 'dissertations'. At the PhD level, however, these terms are reversed. Hence, in America an unfinished PhD project may allow the student to join the ranks of those whom the Americans call the 'ABDs' – the 'all-but-dissertation' brigade. Ex-students proudly put this on their CVs (or résumés) and potential employers consider it as a possible benefit. However, it means that the candidates did not complete what they set out to do. Here, in the UK, we call this 'failure'!

Chapter 5

How to study for a PhD

Action summary

1. As you work on your thesis, think about the questions that you want to answer, not just the work that you are doing. A key part of research is coming up with good questions.
2. Remember that you need only take a small step with regard to the original part of your work for it to be regarded as a contribution.
3. Discuss with your supervisors the many different ways in which a thesis may be presumed to be 'original' and come to some agreement about the way that you will be interpreting this requirement.
4. Consider very carefully the advantage of making your contribution by doing 'testing-out' research for your PhD.
5. Ensure that you rehearse procedures, skills, and techniques prior to using them in your PhD.
6. Explain the limitations of your research, together with a balanced account of your failures and successes.

As we note in Chapter 1, this book does not consider those aspects of research design and methodology that are specific to each discipline, and even to each topic within a discipline. To explore those issues, you will need the appropriate textbooks and handbooks for your subject. The current issues of journals in your field will provide demonstrations of state-of the-art methodological practices relevant to your work.

In this chapter, we discuss some general background philosophical issues concerned with the practice of research relevant to all disciplines. We start with the basic question: 'What is research?' The answer is not as simple as it might seem. We are going to explore some answers to it and examine their relevance to the nature of a PhD, and then consider how that research is presented in the form of a PhD thesis.

Characteristics of research

Let us start with a lay view: 'Research is finding out something you don't know'. This answer is both too wide and too narrow. It is too wide because it includes many activities, such as finding out the time of the next train to London, or taking the temperature of the water in a swimming pool, which we would not characterize as research. Take a moment to consider why we would not do so. And if we were measuring instead the pH value of the water – its acidity or alkalinity – would that be research?

As well as being too wide, that definition is also too narrow, because a lot of research is concerned not with finding out something you don't know but with finding out that you don't know something. This sort of research aims to re-orientate our thinking, to make us question what we think we do know, and to focus on new aspects of our complex reality.

In exploring the nature of research, it is useful to distinguish it from another activity: intelligence- (or information-) gathering.

Intelligence- (or information-) gathering – the 'what' questions

There are a lot of things that we don't know and that we could find out. What are the age, sex, and subject distributions of doctoral students in British higher education? What are the radiation levels in different parts of the UK? What percentage of Britain's GNP is spent on scientific research? These 'what' questions are very important. They require careful definition of terms, unbiased collection of information, meticulous statistical treatment, and careful summarizing to get a balanced description of the situation that gives 'a true and fair picture', to use a phrase from the accounting profession. Inevitably, some arbitrary decisions will have to be made. Conventions are developed that can help to improve comparability – in the measurement of high temperatures, the definition of the money supply, the genetic classification into male and female sexes, etc. – but professionals can and do differ on what they regard as fair, and informed judgement is called for. For example, it is a matter of considerable controversy at present as to what would be a true and fair way to define, and therefore count and categorize, the number of bureaucrats employed in government, the climatic effects on the atmosphere of global warming, and so on.

Since this work is descriptive – answering the 'what' questions – it can be considered as 'intelligence-gathering', using the term in the military sense. Intelligence-gathering is an important activity and intelligence is a valued commodity. A profit-and-loss account of a business, a map giving radiation levels in different parts of the country, a compilation of the evaluations by doctoral students of the quality of supervision they receive, all are examples of intelligence with important uses.

We may use the profit-and-loss account as part of a financial control system, the map of radiation levels to develop nuclear siting policies, the

doctoral students' evaluations to make decisions on selection and training of supervisors. Control mechanisms, policy formulation, and decision-making are the typical uses of intelligence. These are all absolutely vital activities – but they are not research.

Research – the 'why' and 'how' questions

Research goes beyond description and requires analysis. It looks for explanations, relationships, comparisons, predictions, generalizations, and theories. These are the 'why' and 'how' questions. Why are there so many fewer women doctoral students in physics than in biology? Why are the radiation levels different in different geographical areas? Why is the productivity per worker-hour in British manufacturing industry less than that of France or Germany? How can the ideas of a particular theorist be applied to post-colonial literature? How can a particular algorithm be applied to analysing census data?

All of these questions require good intelligence-gathering, just as decision-making and policy formulation do. But the information is used for the purpose of developing understanding – by comparison, by relating to other factors, by theorizing and testing the theories.

Many research questions have comparisons in them. That is, they involve taking two or more situations, and investigating why there is a difference between them. For example, some of the questions above include comparative words such as 'fewer', 'different', and 'less', and the research is to understand why these differences exist. Other research questions might be existence questions: for example, does a mathematical structure with particular properties exist? Others might be about whether a particular approach is effective: can a particular theory shed light on some area of the subject? To be useful, explanations should be applicable in all appropriate situations. These are the focus of PhD study.

Bloom and colleagues' (1956) taxonomy of six educational objectives – (factual) knowledge, comprehension, application, analysis, synthesis, and evaluation – is useful here. Education typically leads you towards the higher levels of this hierarchy. Importantly, at PhD level, you are able to critique the knowledge you have acquired and to bring together ideas from different parts of your research. You achieve this higher level by building on the earlier levels. Fuller et al. (2007) have noted that in disciplines such as engineering and computer science, the aim of research is typically not critique but the application of advanced, critical thought to solving complex problems.

Research is based on an open system of thought

For you as a researcher, the world is in principle your oyster. You are entitled to think anything. There are no hidden agendas, but no closed systems; in American terms, 'everything is up for grabs'. This continual testing, review, and criticism for its *own* sake by researchers of each other's work

is an important way in which thinking develops. Conventional wisdom and accepted doctrine are not spared this examination because they may turn out to be inadequate. Of course, they may not turn out to be inadequate; they may stand up to examination. This is why non-researchers often regard research results as being demonstrations of the obvious or trivial elaborations of established knowledge. This examination, however, has to be done continually because this is how we probe for what is not obvious and discover elaborations that are not trivial.

The key to the approach is to keep firmly in mind that the classic position of a researcher is not that of one who knows the right answers but of one who is struggling to find out what the right questions might be! When you are in the middle of doing the practical part of your research, it is easy to forget the importance of developing good questions. Perhaps you should put aside a regular time to reflect on these and discuss them with your supervisor, such as at the end of each term.

Researchers examine data critically

The character of examining data critically is part of an open system of thought. We list it separately because it is probably the most important single element in distinguishing a research approach from others and researchers from practitioners and laypeople. Researchers examine data and the sources of data critically so that the basic research approach to provocative statements ('women make less effective managers than men'; 'soft drugs are less harmful to health than alcohol'; 'renewable energy sources cannot provide for all our needs in the foreseeable future') is not to agree or disagree but to ask: 'What is your evidence?'

Researchers are continually having to ask: Have you got the facts right? Can we get better data? Can the results be interpreted differently? Non-researchers often feel that they don't have the time for this and are thus impatient with research. Politicians and managers, for example, often need to make decisions under constraints of public pressure or time. This has been demonstrated during the Covid-19 pandemic, where there has been a need to put in place preventative measures before the impact of those measures is fully understood. Politicians' need to act is more important than their need to understand. Researchers' priorities are, of course, different. They have to go to great trouble to get systematic, valid, and reliable data because their aim is to understand and interpret.

Researchers build theories and understand the limits of those theories

An important characteristic of PhD research is that you will construct theories about your topic. It is insufficient merely to present, however well organized, a collection of information.

Medawar (1963) said that the process of scientific discovery was one in which 'out of a disorderly array of facts, an orderly general statement, will somehow emerge'. Cohen and Stewart (1994) summarized this in the phrase 'theories destroy facts'. This means that the aim of research is to discover or invent ideas that explain, probe or question large numbers of individual pieces of factual information. You might, for example, do a lot of interviews, and then use a coding process to draw out a number of themes from those interviews. Often, the aim is to provide insights that can be applied beyond the specific examples that you study. You might interview a sample of dentists about their work, and generalize this to all dentists. You might measure some characteristics of a moon rock, and use that to say something about the composition of the moon as a whole. You might read a number of historical diaries to understand what day-to-day life was like for a group of people at a particular point in time.

This process leads to the strange outcome that at the end of the PhD process, you can seem to have discovered very little. You spend months carrying out experiments, doing interviews or searching archives, at the end of which you will have distilled your findings down into a small number of more general, theoretical ideas. This is an important step towards completing your PhD, but it can lead to the 'imposter phenomenon', whereby you feel that your contribution is small and insignificant. It is easy to forget how hard won your theoretical insights are.

One important kind of theory is that which generalizes from a number of separate pieces of information. In the sciences, this might mean coming up with a mathematical expression that describes the results of many experiments. In the social sciences, it might mean taking questionnaire results from many hundreds of people and grouping them into a number of broad groups. In the humanities, you might look at many works of art, and then summarize these using broader ideas such as schools of painters or changes in artistic style.

Such generalizations are important, but it is also important to explain the limitations of your generalizations. The novelist, Alexandre Dumas *fils*, said: 'All generalizations are dangerous – including this one!' Indeed, research may be said to proceed by insightful but dangerous generalizations, which is why the limits of the generalization – where it applies and where it does not apply – must be continuously tested. A good PhD thesis will make it clear what the limits of applicability of your theories are. It is better to be clear and confident about the limitations of your work, than to over-generalize. It is a strength not a weakness to show these limitations. All work has boundaries of applicability, and your research will be more complete if you demonstrate an understanding of what these limitations are.

Some PhD work might, indeed, be about probing and critiquing previous generalizations. For example, you might show that a previous study only applies in the culture or country where that study was done, and does not apply elsewhere.

Another aspect of explaining the limits of your work is that you should report failed research, and analyse the reasons for that failure. By this, we do not mean that your thesis should explain every twist and turn that you explored and abandoned in the course of your work. But, you should honestly explain the major pieces of work that you did, and if they failed to produce the results that you expected, you should present those results, and analyse why this happened. This can also be important for future researchers who want to build on your research, because it can save them time in pursuing a superficially promising but ultimately unproductive route. We see this, for example, in trials of new drugs, where it can be an important research contribution to understand when a drug isn't an effective treatment.

Hypothetico–deductive method

So, the examination of the adequacy of generalizations, formulated as hypotheses, is the cornerstone of research. 'Hypotheses', said Medawar (1963), 'are imaginative and inspirational in character'; they are 'adventures of the mind'. He was arguing in favour of the position taken by Karl Popper in *The Logic of Scientific Discovery* (1972) that the nature of scientific method is hypothetico–deductive and not, as is generally believed, inductive.

It is essential that you, as an intending researcher, understand the difference between these two interpretations of the research process so that you do not become discouraged or begin to suffer from a feeling of having 'cheated' or having not gone about it in the right way.

A popular misconception about scientific method is that it is inductive: that the formulation of scientific theory starts with the basic, raw evidence of the senses – simple, unbiased, unprejudiced observation. Out of these sensory data – commonly referred to as 'facts' – generalizations will form. The myth is that from a disorderly array of factual information an orderly, relevant theory will somehow emerge. However, the starting point of induction is an impossible one.

There is no such thing as unbiased observation. Every act of observation we make is a function of what we have seen or otherwise experienced in the past. All scientific work of an experimental or exploratory nature starts with some expectation about the outcome. This expectation is a hypothesis. Hypotheses provide the initiative and incentive for the inquiry and influence the method. It is in the light of an expectation that some observations are held to be relevant and some irrelevant, that one methodology is chosen and others discarded, that some experiments are conducted and others are not. Where is your naive, pure, and objective researcher now?

Hypotheses arise by guesswork or by inspiration, but having been formulated they can and must be tested rigorously, using the appropriate deductive methodology. In a deductive argument, the truth of the conclusion must

necessarily follow from the truth of the starting premises. Conversely, if the conclusions are shown to be logically derived but wrong, the original premises must be rejected. If the predictions that you make as a result of deducing certain consequences from your starting hypothesis are not shown to be correct, then you must discard or modify your hypothesis. If the predictions turn out to be correct, then your hypothesis has been supported and may be retained until such time as some further test shows it not to be correct. Once you have arrived at your hypothesis, which is a product of your imagination, you then proceed to a strictly logical and rigorous process, based upon deductive argument – hence the term 'hypothetico–deductive'.

So, don't worry if you have some idea of what your results will tell you before you even begin to collect data; no scientist waits until they have all the evidence in front of them before they try to work out what it might possibly mean. The closest we ever get to this situation is when something happens serendipitously; but even then, the researcher has to formulate a hypothesis to be tested before being sure that, for example, a mould might prove to be a successful antidote to bacterial infection.

Another erroneous idea about scientific method is not only that it is inductive (which we have seen is incorrect) but also that the hypothetico–deductive method proceeds in a step-by-step, inevitable fashion. The hypothetico-deductive method describes the *logical* approach to much research work, but it does not describe the *psychological* behaviour that brings it about. This is much more holistic – involving guesses, reworkings, corrections, blind alleys, and above all inspiration, in the deductive as well as the hypothetic component – than is immediately apparent from reading the final thesis or published papers. These have been, quite properly, organized into a more serial, logical order so that the worth of the *output* may be evaluated independently of the behavioural process by which it was obtained. It is the difference, for example, between the academic papers with which Crick and Watson demonstrated the structure of the DNA molecule (e.g. Watson and Crick 1953) and the book *The Double Helix* in which Watson (1968) described how they did it. From this point of view, 'scientific method' may more usefully be thought of as a way of *writing up* research rather than as a way of carrying it out.

Critical thinking and being analytical

An important part of research is taking a *critical* approach to the existing research literature and to the primary sources in your research, and evidencing this critique in your writing. In everyday language, being critical of something means pointing out the negative aspects of it. This is not what is meant by critique in research. Instead, to take a critical attitude towards something means to take a questioning, analytical approach to it.

You should look at the material that you are studying – books, articles, datasets, archival documents, museum collections – not just at face value, but through the lens of various questions. What aspects of a study were

done well and badly? What hidden assumptions are there in a piece of writing? Why was a particular collection of documents put together, and what was missed out? What bias was there in how data was collected? What alternative ways could this have been done? What other points of view on the topic have been overlooked? Do the conclusions of an argument follow from the evidence presented? Asking these sorts of questions will help you to demonstrate a true depth of understanding when you have to defend this material in your thesis.

Furthermore, taking this questioning attitude can lead you to develop research questions of your own. For example, you might examine the assumptions underlying how a dataset or museum collection was assembled. You might re-do a study with a wider population that doesn't demonstrate the biased sampling of the original study. You might try to resolve flaws that you have found in the methodology of a study. Overall, taking this critical, analytical, questioning approach, rather than a merely descriptive one, is a core part of being an effective researcher.

Basic types of research

Research has traditionally been classified into two types: pure and applied. We find this distinction – implying as it does that pure research supplies the theories and applied research uses and tests them out in the real world – is too rigid to characterize what happens in most academic disciplines, where, for example, 'real-world' research generates its own theories and does not just apply 'pure' theories. We shall consider a threefold classification of research – exploratory, testing-out, and problem-solving – that applies to both quantitative and qualitative research.

Exploratory research

This is the type of research that is involved in tackling a new problem/issue/topic about which little is known, so the research idea cannot at the beginning be formulated very well. The problem may come from any part of the discipline; it may be a theoretical research puzzle or have an empirical basis. The research work will need to examine what theories and concepts are appropriate, developing new ones if necessary, and whether existing methodologies can be used. It obviously involves pushing out the frontiers of knowledge in the hope that something useful will be discovered.

Testing-out research

In this type of research, we are trying to find the limits of a previously proposed theory. This is often termed the 'null hypothesis', which we are bringing

evidence to 'overthrow' (i.e. to show that it is inadequate). This is a basic research activity. Does the theory apply at high temperatures? In new technology industries? With working-class parents? Before universal franchise was introduced? The amount of testing-out to be done is endless and continuous, because in this way we are able to make an original contribution and improve (by specifying, modifying, clarifying) the important, but dangerous, generalizations by which our discipline develops.

Problem-solving research

In this type of research, we start from a particular problem in the real world, and bring together all the intellectual resources that can be brought to bear on its solution. The problem has to be defined and the method of solution has to be discovered. The person working in this way may have to create and identify original problem solutions every step of the way. This will usually involve a variety of theories and methods, often ranging across more than one discipline, since real-world problems are likely to be 'messy' and not soluble within the narrow confines of an academic discipline.

Which type of research for your PhD?

Since we spent so much time in Chapter 4 discussing how not to get a PhD, let us now look on the more positive side and ask how to get one. Consider for a moment the three types of research that we have just reviewed. Which type is likely to offer the best chance of completing the degree successfully? Remember that we have already noted that the PhD is primarily a research training exercise to get you from being a mere beginner in research to the level of a full professional. All research involves working within particular constraints, but those of a PhD are very stringent. They include clear limitations on finance, physical resources, administrative back-up, and – above all – time. So, which of the three types of research would you choose as the best route at this stage of your career? Take a few moments to consider your decision and the reasons for it.

We hope that you will understand why it seems very obvious to us that the appropriate route is that of testing-out research. With this approach you will be working within an established framework and thus learning the skills of doing research in an environment that gives you some degree of protection by the established nature of much of the ideas, arguments, measuring equipment, and so on. A degree of protection in the environment is the best context for efficient learning: being thrown in at the deep end is all very heroic but it does tend to induce a phenomenon known as drowning!

Of course, you will have to make your original contribution – merely replicating what others have done is not adequate. There are many ways of being original, and we discuss these at the end of this chapter.

Or, you will have to apply two competing theories to a new situation to see which is more powerful, or to design a crucial experiment to produce evidence to choose between them. As a result, you may produce your own innovative variant of the methodology or theory. There will always be an appropriate element of exploratory work and you may well solve some useful discipline-based problems on the way. Testing-out is the basic ongoing professional task of academic research, and doctoral work done well in this framework is much more likely to be useful, and thus publishable and quotable.

On the other hand, the idea of tackling an exploratory topic, or solving a 'real-world' problem, both of which have little by way of clear conceptual frameworks in which to work, seems very attractive. This is discussed in more detail in the section on originality at the end of this chapter. Potential employers give considerable weight to the 'real-world applicability' of the research undertaken by PhDs. It is also an approach that the British government wishes to encourage. There is no denying the appeal of tackling such topics, but you should be aware that the risks of failure are much greater. If you have a lot of confidence, stemming, say, from a great deal of practical experience and very strong support from your supervisors (whose input will inevitably have to be greater), you might consider work in the exploratory or problem-solving approaches, but these are undoubtedly less structured and therefore professionally more advanced activities. Most students should be considering whether they can run before they can walk. If you are going to tackle a real-world problem, it may be that the more structured and limited project of a professional doctorate might be more appropriate for you. For more information on this approach, see Fulton et al. (2013) and the section below on professional doctorates.

It is also fair to point out that even if you do obtain a PhD for work that is completely exploratory or problem-solving, which is less likely, there will almost inevitably be a considerable element of being given credit for a 'brave try' (examiners being kind people who look for ways of passing students). So, in these circumstances, it is less likely that your work will make sufficient impact to be publishable and quotable than if you do well in the testing-out approach. It will then serve you less well as a base on which to build a research career. It is as well to remember, that while a crucial element of originality is required for a successful PhD (as we discuss fully on p. 78), it is a wise student who decides to postpone the pleasures of attempting to be *totally* original until after the PhD has been obtained.

The practice of doing research

Although developing as a researcher involves acquiring skills and knowledge in your subject, it also involves learning the skills of doing research. As with any skill, you develop this one by doing it, and improve by reflecting on what you have done, in addition to getting feedback from your supervisor and others. After you have decided on your research approach and the field in which you wish to work, you should be systematically considering how you are going to get the training that you require to develop the skills you need.

These are many and varied, and depend on your particular discipline. There may be courses you take, or may be required to take, which will develop your skills. But a key initial task is to watch and talk to established researchers in your discipline and note down, as systematically as you can, what practices, skills, and techniques they use. This method of learning is known by apprentices and occupational psychologists as 'Sitting by Nelly'. Hopefully your supervisors will act as exemplar researchers, but you must examine and learn from others too.

Your second task is to practise these skills as much as you can, getting feedback on how well you are doing. Adults learn best in situations where they can practise and receive feedback in a controlled, non-threatening environment. A good principle to follow is: no procedure, technique, skill, etc., which is relevant to your thesis project should be exercised by you there for the first time. You should always have practised it beforehand on a non-thesis exercise, which is therefore going to be less stressful and will allow for greater learning. Your trial exercises will allow you to learn about your ability to carry out the range of professional skills that you need to develop. You will gain feedback, not only from your supervisors but also other professionals (e.g. IT experts, laboratory technicians, archivists, librarians, statisticians) and from your own evaluation of what you have done.

This may seem an eminently sensible principle, and you may wonder why we are labouring it. After all, it is obvious that skills need to be practised if they are to be performed well. Just as an art student won't expect the first oil painting she ever attempts to be exhibited at the Royal Academy, a poet won't expect his first poem to be publishable. They are likely to be apprentice pieces – learning experiences.

In fact, as regards PhD skills, this issue is often not thought through particularly well. If the thesis or dissertation (which may be 60,000–80,000 words long) is your first attempt at writing anything longer than, say, the answer to an examination question, a term essay or a lab report, then of course it is going to be a daunting task – you just haven't developed the

necessary skills yet. Analysing the data from the key experiment or survey you have just carried out is precisely not the time to discover for the first time the joys of getting your data into, and the results out of, a computer – you should have practised that skill beforehand. Again, it does not seem sensible to base your PhD thesis study on the first faltering questionnaire that you have ever tried to devise. But all too often people do, and later pay the price for their inevitably less than skilled performance in questionnaire design.

There are many more skills that a doctoral student needs to set about acquiring. They range from the seemingly mundane but absolutely crucial ones of maintaining your lab apparatus and conducting a computer-based literature search, to the more conceptual ones of being able to evaluate quickly the relevance and value of published work. You will need to have found out what skills are relevant to your requirements and to have practised them, so that in your thesis project you can apply them with some confidence. Many of these skills will be transferable ones, of use not only in academia but also in other careers you might choose. In Chapter 3, we discuss courses currently being offered in most universities that will contribute to your professional armoury.

Developing research skills

Every researcher needs to develop a set of subject-specific skills. If your research is based in a laboratory, you will need to develop the techniques and methods that are appropriate to the experiments in your area of work. If you are working in a social science area, you may need to develop skills in, for example, designing questionnaires, carrying out interviews or running focus groups.

Beyond these subject-specific skills, there is also a range of generic skills that every researcher needs to develop. In the past, these were often taught by obliging you, as a beginning PhD student, to attend a series of courses covering the basics. More recently, universities have realized that students start their PhD with some relevant generic skills, and that these need to be developed in line with the requirements of your specific project.

To help you understand what skills you have, and which ones you need to develop, many universities now begin this skill development not with a generic course, but with an exercise designed to help you appraise your current competence, and identify areas for improvement. This can take the form of a questionnaire, but a better way to do it is through discussion, either with an experienced person who knows about how people develop as researchers or in a group with other PhD students.

A popular approach for this is the Researcher Development Framework (RDF) developed by Vitae Consulting. It divides the skills that you might

need into a number of broad categories, such as *Research Governance and Organization* and *Personal Effectiveness*. Each of these categories can then be broken down further; for example, *Personal Effectiveness* can be seen to include time management, self-reflection, networking, and career planning. By thinking about each category in turn, you can reflect both on your current ability in these areas, and which areas to prioritize in support of your PhD work. You can then work on them through self-study and reflection, taking a self-paced online course, or joining a workshop or course at your university.

It is important to balance skill development with the core research and writing for your PhD. You should not be doing courses for their own sake, but because you have identified a gap that would be corrected by doing a particular course. Some supervisors can be cynical about the value of generic research skills development, seeing it as a distraction from research work. We disagree, because developing skills can help you become a more efficient researcher and produce higher quality and more rigorous work. Having said that, we have known some students who attend endless workshops and courses as a way of avoiding difficult work on their PhD. This is to be avoided at all costs.

Research tools

Learning to use specific tools is an important part of your PhD work. As you progress, you will find that you need different tools depending on where you are in your PhD studies. At the beginning, online literature searching will be important, whatever your discipline. Sites such as scholar.google.com, which index papers and references, are vital research tools; there may be subject-specific sites for your subject too (for example, philpapers.org is an authoritative index of papers in philosophy). You can use such sites both to find papers on a particular topic through keyword searching, and by following the references back and forth from a paper. One particular value that these sites have, by contrast to the papers themselves, is that you can look *forward* in time to see which papers have cited a particular article; this enables you to work forward from a paper of interest to the current research frontier in that subject.

Another way to keep up to date with current developments is to follow appropriate social media. Some researchers use Twitter as a way of engaging people in their research field, for example, by tweeting links to papers that they have found interesting, ideas for research questions, and links to just-published papers. Many research fields will have email lists or online forums containing a mixture of discussion of topics, calls for submissions for conferences and edited books, announcements of funding calls, etc. As well as passively reading these, you might also decide to set up something

of your own – for example, you might set up a Twitter account that gives a link to, and short summary of, a paper in your field every week. If you do this, then it is a good idea to set this up as a new account separate from your personal social media accounts. Maintaining a frequently-updated and useful social media presence such as this can be a good way of becoming known in your community.

As you move into the central part of your PhD, the tools that you use will become more specialized. In an experimental science discipline, it is likely that you will need to work closely with expert users in your lab (postdocs, more experienced PhD students) to learn how to use complex pieces of equipment – including the tricks and techniques that are not documented in the manuals. In archive-based disciplines, you will need to get to grips with obscure ways of finding information, much of which might not have been indexed in a very systematic manner. In the social sciences, you may well need to become familiar with the systematic design of questionnaires, the various ways of carrying out interviews, or the subtleties of being a participant observer. To develop some of these skills, you might need to attend courses, either within your university or run by a learned society or professional association.

You should also become aware of how various changes in information and computer technologies might influence your work. Administering questionnaires has been transformed by sites such as www.surveymonkey.com. In particular, the combination of an online survey together with announcements to mailing lists and subject-specific forums enables researchers to gain access to a large number of survey participants from around the world. Sites such as Amazon Mechanical Turk (www.mturk.com), where users carry out tasks in return for small payments, have been used by psychology researchers to acquire a wide subject pool. These methods are not without controversy, since there is considerably less control over the participants than there might be in more traditional approaches. Similarly, whilst systems such as Skype, Zoom, and Google Hangouts allow you to interview people at a distance, some of the richer experience that comes from a face-to-face interview is lost. These are difficult decisions to make, and you should consult with your supervisor regarding the advantages and disadvantages of these various techniques.

Of course, some tools are essential regardless of subject. You will need some way of documenting the day-to-day work on your PhD; whether you do this in a notebook, in a Word document, a collection of index cards, or a more structured system such as Evernote (www.evernote.com) is down to you. It is good to experiment with different methods, balancing out such factors as ease of access, ease of searching back, and how easy it is to restructure and rearrange material.

It is important to think about the different reasons you might take notes. You might summarize papers or suggest connections between different ideas in the research literature. You might write notes about ideas for research

directions, tentative hypotheses, or questions that you could answer in your thesis. You might write down summaries of techniques in the form of short'"how to' lists. You might make practical notes about deadlines for conferences or publications, or self-imposed deadlines for completing specific pieces of work. Importantly, these should be well-organized. For example, you should use different sections of a notebook, or different folders on your computer, for different things; an advantage of having your notes on a computer or phone is that you can search directly for specific words or phrases.

You will also need some way of keeping track of references. It is advisable to use a reference management system such as BibTeX, Mendeley or RefWorks. In these systems, you create a list of the papers that you want to refer to, and give a unique reference label to each of them. Then, you put these labels into your thesis document, and the reference management system automatically creates a reference list. This has two main advantages. First, if used consistently, all of the references you cite will be included in the reference list. Second, you can easily change the reference style. For example, if your thesis uses the Harvard reference format, and you want to take an excerpt from the thesis to adapt for a journal paper that needs an alternative format, you can do this automatically. More details on this are given in Chapter 7, which is about writing your PhD.

Reading for a PhD

As a PhD student, you will spend a lot of time reading material from the research literature in your field of study. In Chapter 3, we discuss how to find relevant material to read. You should understand the variety of reasons why you are reading these papers, and the relationship that this reading bears to the development of your PhD. Also, there are a number of different reasons why you might reference or take a quotation from the literature, and these are related to the reasons for reading.

One role that a paper or book can take is that of setting up or describing the work that you will tackle in your thesis. Most directly, the conclusions section might suggest directions for future development of its ideas, which you could pursue in your PhD research. Less directly, whilst reading an article you might think about some alternative approach to the research question being tackled, or make some other connection that sparks off ideas for your research. To encourage this, it is important to take a questioning attitude as you read. Why did they do it this way? What might they have done instead? What is the next step in this research? What hidden assumptions are there behind the approach taken? If you tackle your reading with these sorts of questions in mind, then a paper becomes a source of new ideas as well as a description of what the authors have done.

Other papers provide useful information for your PhD. They could contain datasets that you reanalyse in your work, or that you combine with other information to make an argument or analysis in your thesis. They might describe a methodology or a technique, either as the focus of the paper, or because the paper is an exemplar of the technique. Perhaps you will read a tutorial book explaining how a particular technique has been applied to different research problems. Alternatively, an article might apply a new methodology to a specific question, and you take that methodological approach and apply it to your own research question. In some disciplines, reading *primary sources*, such as novels in a literature PhD or archival documents in a history PhD, will take up much of your time.

Something else that you can get from your reading is a baseline or comparison for your own research. Perhaps you are applying some new technique to an existing problem and want to know how effective that technique is. One way to do this is to find articles that tackle the same problem and compare the results of your new technique with those. Depending on the discipline, this comparison might be a quantitative measure demonstrating how fast or accurate your technique is compared with others. It could even suggest a discursive, qualitative approach, where you write about the differences, not necessarily with the aim of providing a single ranking of techniques.

A final, and perhaps neglected, role that a paper can take is as an exemplar of how to present a piece of research. Occasionally, what you take away from an article is the clarity of its structure or argument. These can be used as a model for thesis chapters or articles that you write. You can look at the model paper as an example of how to structure the argument, and carry that structure over to your own work.

The PhD in a practice-based discipline

In practice-based disciplines such as art, architecture, music, and design, where innovation in the field is often demonstrated through the creation of artefacts, these works may be submitted for a PhD degree. Thus, a portfolio of artwork or a conventionally notated musical score may be submitted. The works must be to fully professional standard and judged worthy of public exhibition or public performance.

Because the PhD is essentially a theoretical enterprise, as we explained above (see p. 60), the artefact must be accompanied by a text of explanation and commentary illuminating the candidate's methodology and aesthetic intentions. As in any subject area, PhD candidates must be able to defend and explain in what way their doctoral work constitutes an original contribution to the extension of knowledge in their field; they must also be able to understand and to communicate the research context in which their

work belongs. This is the crucial difference between an artist's private practice – developing their own work just for themselves – and practice as research that may be submitted for a PhD degree.

Questioning previous work or clarifying its meaning and impact are also important contributions. As with any PhD, there is also a need to convince the examiners that the candidate understands what is involved in conducting the research. This would include, for example, describing difficulties encountered in the research and strategies undertaken to overcome them, together with a statement of possible future directions of work.

It is the responsibility of universities to define what constitutes an acceptable PhD submission in a practice-based discipline. As examples, we may quote one university (Nottingham) whose regulations for a PhD in music require a composition 60 minutes long with an accompanying commentary of 20,000 words, and another (University of the Arts, London) which requires an appropriate archival record of the candidate's artistic practice (video, photographic, digital) together with a minimum 30,000 word text. As always, you must read the regulations of your university.

The PhD as a series of projects

An alternative format is for the PhD to consist of a number of smaller, conceptually linked projects. Such a format allows you to demonstrate a wider range of skills and knowledge than a single project, and can provide a stronger contribution to the field than a single, extended study that is padded out with excessive detail. Whether a PhD in this form is acceptable, unacceptable or, indeed, normal will depend upon your discipline. The best sources of information for this are the regulations of your university, discussion with your supervisors, and reading recent successful PhD theses in your discipline.

A PhD in this format would typically have a single literature review and introductory section, outlining the unifying theme of the thesis, and then each chapter would be written in a way that it could be read without reference to the other projects; for example, each might apply the same technique described in the introduction to a different case study. Finally, there would be a unifying conclusions chapter, pointing out the similarities and differences between the projects.

It is important that you don't use a format such as this to avoid getting deeply into a research area. A PhD structured in this way will still need the same depth of engagement with the research ideas and make a decent original contribution to knowledge in the research field – a pile of masters-level projects does not make a PhD. A good guideline is that each of the substantive chapters should describe a project carried out to the standards of publishable papers in refereed academic journals. This is evidenced, for

example, by the regulations for the PhD by Portfolio at the University of South Wales: 'The portfolio should relate to a maximum of three projects accompanied by a critical overview. The projects may be work related and derived from empirical or conceptual investigation and the overview will demonstrate the relationship between them. Together, the projects and critical overview should fulfil the requirements for a research degree at the relevant level'.

The PhD by published work

A variant on the idea of the PhD as a series of projects is the PhD by published work. This is where you submit a set of peer-reviewed articles already published in academic journals, conference proceedings, edited books or monographs, together with an overview document that contextualizes the specific articles within the discipline. In particular, this document needs to emphasize the candidate's contribution to multi-author works that form part of the submission and demonstrate that they can all be contained within one theoretical framework. This is then examined in the same way as a traditional thesis, with examiners appointed by the university and a viva held.

Historically, this route was for staff members of the institution. For example, research-active teaching staff without a PhD might submit a collection of their ongoing work. Another example is research assistants, who might want to get a PhD for their contribution to their departmental research project.

In recent years, this route has, in many universities, been opened up to a wider range of candidates. Typically, there is an initial application stage, where the university will make a prima facie judgement as to whether the published work is broadly of the scale and scope needed. Then, the applicant will register as a part-time student for 6–12 months and get a small amount of support from an academic advisor in preparing the overview document.

An example of the requirements for such an award are given by the following excerpt from university regulations (this example is from the University of Kent):

> The University will award this degree to registered candidates whose submitted work:
>
> - forms a coherent body of research
> - is timely and current as determined by academic judgement
> - demonstrates the use of appropriate research methodology
> - meets the criteria for the Doctor of Philosophy as specified in the Regulations for Research Programmes of Study.

The most important part of that description is that the submission needs to form a 'coherent body' of work. You need to show that you have the depth of knowledge in a single area that would be expected of a conventional PhD student.

An example of the experience of one student who took this route is given in an article in the *Independent* newspaper (Willis, 2010). Richard Willis had been working in education research for a number of years, and wanted to get a PhD in order to advance his career. He had produced six papers in 'quality academic journals' and two books. His first experience was not so positive. He was assigned a supervisor who had minimal experience in the topic of the publications, and when he submitted his supporting document he was told, after a long delay, that it was inadequate. However, he then registered at a second university, which took much more care in supporting him with his application.

He summarizes his experience by noting that it is 'difficult to argue' that the work is inadequate, as it has already passed through peer review, and that it is easier to fit study around work and ongoing article writing. However, he argues that university regulations and practices are not always very helpful for this kind of PhD: in particular, 'It is not always clear whether the supporting statement is intended to be an application form or an in-depth report'. Another article (Willis and Cowton, 2011) notes that there is a vast difference in requirements between different universities in expectations for the supporting document; just in length, regulations vary between advising 2,000 to 25,000 words.

If you already have a good, coherent body of peer-reviewed, high-quality work, then this provides a fast route to a PhD. However, you should take care to ensure that the university that you choose is committed to, and fluent with, the process of assessing this kind of PhD, and that the examiners chosen are familiar with and comfortable with this kind of work.

The professional doctorate

An alternative to the PhD in some areas of professional practice is the *professional doctorate*. These are named for the area of professional activity, and many titles are used: DBA (business administration), DClinPsy (clinical psychology), EdD (education), EngD (engineering), and DSW (social work). The well-established MD for medical consultants was an early example of this type of degree. If you are considering doing one of these degrees, you are likely to be someone with several years of work experience in the area.

Many students study part-time whilst continuing ongoing professional practice. It is also common for academics responsible for these degrees to place more emphasis on students being part of a cohort who start at the

same time, and help each other to develop by sharing professional knowledge and experience. So, you will need the commitment to study while continuing your work for considerable time (typically five years), as well as developing appropriate organizational and time management skills.

The core idea is that you become aware of the latest research and new ideas in your profession in the context of your own professional practice, critically examining and changing your practice in response to your studies. As Gregory (1997) put it: if the PhD is for 'professional scholars', then these degrees are for 'scholarly professionals'.

Contrasted to the PhD, these courses usually begin with a number of formally assessed modules. These modules bring you up to date with research relevant to your profession, and you are examined both on your knowledge and skills as well as how you would apply them to your own practice. Often, these modules are a combination of postgraduate-level topics in your area, and research skills modules where the outcome consists of preliminary work leading to the research project, such as a literature review.

The major component of assessment is still a research thesis, albeit usually a shorter one than a PhD thesis, but with a similar structure. For example, the work in your thesis must be grounded in a thorough examination of the literature, specifically to explain your approach and to make the methodology clear. Importantly, this report must still have a 'thesis' – a core idea, hypothesis or question that is being investigated in a thorough, evidence-based and critical manner. All of these aspects will be considered in the context of your profession and discussed using examples of your own professional practice, and how it has been informed and transformed by your studies.

Time management is particularly important. This is because in addition to continuing your professional work, you will also be studying. This means you will need to manage both taught courses and your research project. Often, you will also need to get appropriate access and approvals, which can take a long time. If your research is with children, animals or hospital patients, for example, you may have to go through a complex ethical approval process. Alternatively, you might need to negotiate access to data in your workplace and obtain permission to use it in your study. Overall, time management will be the key to success: it is important to establish a routine in which you reserve time for your research, your job, and your social situation (e.g. your family).

As we emphasize at the end of this chapter, an important part of doctoral study is making an original contribution and there are many ways to be original. For a professional doctorate, this originality will be in the context of your career. For example, are the novel ideas that you introduce in your thesis useful for people working in your occupation? Do the original findings in your thesis help people to develop their professional practice? Does your research bring together different viewpoints in your area of work in a

new way? Have you transferred professional knowledge from one area to another? You don't need to have done all of these, but you will need to show at least one dimension of originality and how it can help both your professional practice and provide guidance to others in your occupation.

In Chapter 4, we discuss various ways of not getting a PhD. These concerns apply to the professional doctorate too. Underestimating what is required can cause problems. Key questions will be: what have you added beyond the professional skills required of a master's degree? Have you collected data on an issue that has not been examined before? Have you stressed some insights into your work that can be used by fellow professionals? These are the sorts of original contributions that the examiners will be looking for. Similarly, over-ambition can be a problem, as can lack of understanding of what is required. A particular challenge is the need to balance academic research, a contribution to the profession, and the development of your own professional practice. To evidence all of these in the thesis is an exciting but difficult undertaking.

The viva in a typical programme will be similar to the viva for a PhD – a discussion, often several hours in length, of your work. However, for a professional doctorate, the examiners will also be looking to understand how the taught modules you carried out towards the beginning of your degree programme have informed your research study, and to understand the implications of your research for practice in your area and for your own professional development.

So, you have to cover both aspects, the professional and the academic. If this seems tough, remember it is, after all, what a 'scholarly professional' should be doing. One important way to understand these expectations is to put effort into reading and evaluating successful theses to discover what standard is required.

Overall, these offer an in-depth opportunity for you to develop in your profession, and in some occupations it is becoming an important part of career advancement, as well as being a way in which research gets translated into practice. The benefits of becoming a 'scholarly professional' are, undoubtedly, great for those who can manage this challenging route to obtaining a doctorate.

The concept of originality

The aim of this section is to help you to get used to the idea that it is easy to be original. As you read further and realize the different definitions of originality that are acceptable, you should begin to feel more comfortable about your ability to be sufficiently original to satisfy your examiners.

The PhD is awarded for 'an original contribution to knowledge'. In the statements that most universities have to guide examiners on the grading

of theses, there is usually some reference to 'unaided work', 'significant contribution', and 'originality'. As Francis (1976) has pointed out, however, you may be original in any one of a number of possible ways.

Francis, a professor of hydraulics working in the area of civil and mechanical engineering, observed eight ways in which students may be considered to have shown originality. We agree with only the six listed below:

1 setting down a major piece of new information in writing for the first time;
2 continuing a previously original piece of work;
3 carrying out original work designed by the supervisor;
4 providing a single original technique, observation, or result in an otherwise unoriginal but competent piece of research;
5 having many original ideas, methods, and interpretations, all performed by others under the direction of the postgraduate;
6 showing originality in testing somebody else's idea.

He concludes that the examiner's interpretation of this ambiguity is an important component in the decision whether or not to award the PhD degree.

In later research EMP found, in interviews with students, supervisors, and examiners, nine further definitions of how a PhD can be original. These are:

7 carrying out empirical work that hasn't been done before;
8 making a synthesis that hasn't been made before;
9 using already known material but with a new interpretation;
10 trying out something in Britain that has previously only been done abroad;
11 taking a particular technique and applying it in a new area;
12 bringing new evidence to bear on an old issue;
13 being cross-disciplinary and using different methodologies;
14 looking at areas that people in the discipline haven't looked at before;
15 adding to knowledge in a way that hasn't been done before.

A total of fifteen different definitions of originality has thus been obtained from those involved. This should be reassuring. It is much easier to be original in at least one of fifteen possible ways than it is to be singularly original.

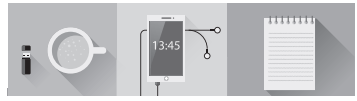
The main problem is that there is little or no discussion between students and their supervisors of what constitutes originality in the PhD. Although students and staff use the same word to describe a range of different concepts, they do not discuss with each other the definitions to which they are working. Furthermore, academics think that it is not too difficult to be original because it is not necessary to have a whole new way of looking at the

discipline or the topic. It is sufficient for the student to contribute only an incremental step in understanding. Unfortunately, supervisors do not usually tell their research students this.

For their part, doctoral students' thoughts on originality change as they progress through their period of registration. In the beginning, research students tend to say things like, 'I'm worried about that – I don't know how creative I am'. Students in their third year are more likely to say, 'Now I know it can be just a small advance in everyday life; before I knew this, I was worried about being original enough'. Eventually, as part of their academic development, students acquire a similar grasp of what is expected in the way of a small step forward, but do not seem to be helped towards this realization by their supervisors. Be warned that once students get over their initial worry about their ability to be original in their thesis, there is a tendency to go almost to the other extreme and decide that doing a PhD is not really creative at all. The good news for you is that, typically, students get to the point where they are no longer worried about being original enough.

This section should have helped you to reach the point of feeling confident about being original sooner, rather than later. Do remember that because the PhD is awarded for 'an original contribution to knowledge', it remains an extremely important concept.

Chapter 6



How to manage your supervisors

Action summary

1. Be aware that you must accept the responsibility for managing the relationship between you and your supervisors. It is too important to be left to chance.
2. Ensure that you have a first supervisor and a second supervisor, rather than two supervisors with equal responsibility. Get assurances from your supervisors that they will maintain email, text or telephone contact with each other, and jointly meet with you once a term at a minimum.
3. Try to fulfil the expectations that supervisors have of their students. If you cannot fulfil any of these expectations do not neglect them, but develop your assertiveness skills so that you can raise the issues in discussion.
4. You need to educate your supervisors continually: first on the research topic, in which you are fast becoming the expert; second, on ways of understanding how the supervisory role can best help in your own professional development.
5. Look for ways of reducing the communication barrier between you and your supervisory team. In addition to research content, discuss at various times working relationships, setting deadlines, what doing a PhD means to you, the adequacy of provision for research students, and so on.
6. Prepare an agenda for tutorial meetings. Ensure that every time you leave a tutorial you have agreed and noted down a date for the next one. Be punctilious in meeting appointments and deadlines, so that your supervisors will be too. Remember to take notes about what was discussed and what you have planned to do by the next meeting.

7 Help your supervisor to give you better feedback on your work. Always ask supplementary questions to ensure that you understand fully what is required of you.
8 If you are seriously considering changing supervisors, use an appropriate third party as a mediator.
9 Avoid inappropriate personal relationships with your supervisor.
10 Refer to the self-evaluation questionnaire on student progress in Appendix 1 to help you focus on the issues.

In this chapter, we consider a series of strategies for handling the all-important student–supervisor relationship. The relationship is so crucial that students cannot afford to leave it to chance. A good working relationship with your supervisors is a core element of PhD success. Good supervisors will be, at various times throughout the PhD, advisors, mentors, collaborators, critics, and generators of ideas and directions for your work. They are not, however, the 'project managers' for your PhD. That is your own responsibility.

During your PhD, you will have ups-and-downs in the success of your work and your confidence in it. It is important to recognize that this is true of your supervisors too, though they will have a stronger feeling for the direction of a PhD project because of their greater experience. An important part of building a successful supervisory relationship is to engage your supervisors in the successes of your work, and to ensure that they remain confident in your developing project. Supervisors are not immune to uncertainty and lack of confidence, and recognition from you that the supervisory relationship is going well is important. If you feel that your supervisors have provided exceptional support, perhaps your university has a scheme where you can nominate them for an award.

It is important to recognize that you are not completely powerless in this asymmetrical relationship. In this chapter, we will give you advice on what you need to do to manage it successfully.

The supervisory team

Recommended guidelines, applicable to all British universities, state that every research student should have a supervisory team of at least two, and occasionally three, appropriate academics. This provides contrasting expertise in different areas of the project. A more experienced academic may be paired with one who has less experience of supervision. This serves both to support the student by monitoring their progress, and to aid the less experienced supervisor with their career development. Typically, one

supervisor will be identified as the main supervisor, and the other(s) will give additional support when necessary. It may also be that one member of the team is appointed especially to give pastoral support.

Advantages of supervisory teams

Supervisory teams are set up so that many of the difficulties that appear in the one-to-one supervisor–student relationship can be avoided, or at least reduced. The supervisory team has many obvious advantages.

- **Greater range of academic expertise to call on.** A wide-ranging research topic has a better chance of being accepted and well supported when there are staff members available with knowledge of the different areas to be covered. Similarly, if there is easy access to expertise in different methodologies or different techniques you can benefit from help with setting up laboratory equipment or with statistical problems. Interdisciplinary research obviously benefits from team supervision.
- **Multiple viewpoints on your research project.** Searching questions need to be asked at the start of your research, and at various points along the way, about its direction and scope. These are important for the eventual outcome, and having several people involved with different points of view can be extremely productive.
- **More influence on the choice of your lead supervisor.** A supervisory team gives you some flexibility in choosing your main supervisor. If you don't get on well with one member of the team, you can seek out another supervisor and, by maintaining continuous contact, make that one your main supervisor whether or not that was the original idea. You can then reduce contact with the member of staff whom you find unhelpful or unsympathetic to your ideas. You will then have the advantage of a new main supervisor looking at your work in an original way, which will help you to a relatively fresh perception of your own, familiar research. This also provides some stability if your main supervisor were to leave the university.
- **Potential of a wider professional network.** Multiple supervisors can potentially be your introduction to multiple contacts with a wider range of relevant professionals as and when they may be needed.

The team system is also of benefit to members of staff because it offers new supervisors the opportunity of working with their more senior colleagues and thus obtaining greater experience in supervision. More broadly, having a supervisory team allows the various supervisors to discuss ideas with each other and boost one another's confidence as supervisors.

The supervisory team's limitations (or when it does not work and what you can do about it)

The supervisory team system does have its limitations though, and you may find yourself on the receiving end of some of them. Having more than one supervisor may seem like a good idea at first; after all, two or even three academics, instead of just one, will be involved in your research studies. But there are negative as well as positive aspects to be considered. Difficulties may stem from:

- **Undue predominance of two supervisors over one student.** There should be regular three-way meetings with both your supervisors. However, such meetings may present problems for you, the student, in terms of feeling overwhelmed. It is possible that you might feel that you have powerful people ganging up on you, which could reduce the expression of your real ideas and feelings. Guard against this and, if necessary, let your supervisors know that you need help in this respect by being as open and honest as you can about how you experience the three-way meetings.
- **Diffusion of responsibility.** Where no distinction in agreed roles is established between members of staff, there is the clear likelihood that each supervisor will regard the other as taking the lead and having more of the responsibility. Even if this feeling is only subconscious, as it may well be, it acts to reduce the commitment of both of them. There have also been cases where supervisors use the student in order to score points off each other in their own power struggles. You must try to ensure that these problems of appropriate contribution are addressed early in the process so that all of you know exactly who will be doing what, and when. An important step is to get agreement on the unequivocal division of the areas of responsibility between your supervisors.
- **Getting conflicting advice.** The probability of seeing both/all your supervisors at the same time is considerably less than that of seeing them separately. They almost certainly will not have had a chance to confer beforehand, so it could happen that you are regularly given conflicting advice. If the conflict is not major, the most common way out for you is to do what they both suggest, in the end doing considerably more work and delaying the progress of the project. You can help to reduce this problem by ensuring that all communications are circulated to all members of your panel. With email this is very easy to do. If you find that one of your supervisors has written to you without copying in their colleagues, then you just forward it on. This greater interaction will hopefully reduce the work you are having to do.
- **Playing one supervisor off against another.** It is not only the supervisors' behaviour that might lead to problems – you, the student, also have a

dangerously seductive avenue available. If you feel frustrated, alienated, trapped into doing something not of your choosing, then you can spend (waste) a lot of time and emotional energy playing one supervisor off against another. Beware, be warned, avoid such a course of action. For this reason, it is more useful for you to have a first supervisor who takes the lead and a second supervisor who gives support, rather than two equals.

- **Lack of an overall academic view.** The biggest difficulty associated with supervisory teams is that there is less likely to be one person who is willing to take an overall view of the thesis. Who will evaluate and criticize it as a whole in the same fashion as the examiners? The weight of the necessary self-evaluation that you have to do is therefore considerably increased. But there is no reason why you could not suggest to one of them that they might play that role, and undertake the responsibility for evaluating your thesis as a whole.
- **Lack of the supervisors functioning as a team.** There are cases where lead supervisors feel very possessive of their students and dislike the whole idea of sharing them with others. They see the participation of even a second supervisor as diluting their authority, and freeze them out. Then there are cases where the second supervisor is happy to remain purely nominal, hardly making a contribution at all. Or you may find that you do not have a team to supervise you because you are in a department where, although the formal appointments are in place, the staff are not committed to this way of working. If you discover yourself to be a victim of any of these failings of the team be sure to seek out your research tutor to discuss the situation.

These are some of the pitfalls that can occur with a supervisory team, and a few suggestions for avoiding or overcoming them. It is very important that considerable care be given to its operation. Confront problems head-on as soon as you are aware of them.

In spite of these potential difficulties, there is every reason to expect team supervision to work well, provided it is given sufficient thought. To increase the likelihood of success, bear in mind the following two golden rules of communication:

Rule 1: Meetings. In most universities, there will be a standard schedule of meetings between you and your supervisory team. If this is not the case, then you should arrange a preliminary joint meeting early in your first term, where all of you discuss how the project should develop. Arrange further meetings at least once a term (always remembering to be aware of the cautions given above).

Rule 2: Reports. Ensure that all your supervisors are kept on board. They should be made fully aware of your progress by e-mailing each of

them a copy of what you are currently writing, but make it clear whether it is for 'information only' or 'for comments'. Ensure that they know of each other's reactions to your work if there are differences. This enables you to call on them for their special knowledge and skills and thus obtain good supervisory support.

Finally, remember that even if you have more than one supervisor, it does not mean that you are denied access to the expertise of other academics for particular aspects of your work. You can, and certainly should, go to them for help, advice, and criticism as often as you need them. Your supervisors are not going to object so long as you make sure that they are kept informed of any developments in your work.

What supervisors expect of their doctoral students

So the student–supervisor relationship is a key element in your success as a PhD researcher. As we have seen above, you must take an active role in managing it. If you are to do this well, you must understand what your supervisors expect of you. Once you have this inside information, you will be in a better position to develop the skills necessary to reduce any communication barriers and sustain the relationship for mutual benefit. In a series of interviews, EMP found the following set of expectations to be general among supervisors regardless of discipline.

Of course, students also have expectations of their supervisors. Chapter 11 contains advice aimed at supervisors. We recommend that you read this chapter, too, as it will give you an idea of what you might reasonably expect from them.

Supervisors expect their students to be independent

This is not as straightforward as it may at first appear. Despite the emphasis placed on independence throughout the whole period of working for a PhD degree, there are still very important aspects of the process that demand conformity: conformity to accepted methodologies, to departmental and university policies, to style of presentation, to the ethics of the discipline, and to all those things which your supervisors consider to be important. They are in a powerful position with regard to your work and your progress through the system. For these reasons, it is no simple matter to balance the required degree of conformity with the need to be independent. The difficulty is compounded when we remember that many research students come directly from a university and from schools that encourage obedience. The problem was made explicit by Dr Chadwick when he spoke of his first-year research degree student in theoretical astronomy:

> Charles asks too frequently, 'What do I do next?' I prefer a student to think for himself. He's not among the very best people we've had, but his progress is reasonably satisfactory. The only slight hesitation I have about him is an indication of lack of original thought shown in an obedient attitude, which results in his doing whatever I say.

Here we have a situation where the student needs to be given the structure necessary for organizing his work, but the supervisor considers that to direct his student to such an extent would be making him too dependent. In this case, Charles went to several members of staff in the department asking for their advice on what he should be doing. In an interview about his progress, he said: 'Nobody cares if you come in or you don't, if you work or you don't. There's no point in making any effort – it's important to have someone standing over you'.

Charles was emphasizing the fact that, as he saw it, it was not necessary to do any work that was not being closely monitored. He needed more direction than his supervisor was prepared to give and wished to rely more on Dr Chadwick's assessment of his work than on his own judgement. Charles should have spoken more openly to his supervisor about his difficulties in becoming instantly independent in his new situation. Of course, this is easier said than done. First, a student has to identify the problem and, second, pluck up enough courage to raise the issue in discussion. (It might help to take this book in to your next tutorial – opened at this page!) If Charles had managed to raise the subject, a lot of unhappiness on the part of the student and disappointment on the part of the supervisor would have been avoided.

Supervisors expect their students to produce written work that is not just a first draft

Having actually written something, you may well feel such a sense of achievement and relief that you want to get it in to your supervisor's hands immediately, especially if you have already missed a deadline or two! However, it is no more than a matter of courtesy to take the time and trouble to present it properly. As we explain in Chapter 7, follow the 'writing process cycle' to get feedback on your work from, in turn, your colleagues and your supervisors. Do not expect your supervisor to act as a copyeditor for your thesis or any other writing you prepare, including conference papers and journal articles. Be sure to use your computer's spellchecker if you are not sure of a word. You want your supervisor to concentrate on the content of the paper, not the mechanics. It is easy for a reader to be distracted by bad spelling and grammar. Don't waste the precious time you spend with your supervisor on details with which your colleagues, fellow PhD students, friends or members of your family can help.

Seeking advice and comments on your work from others is an excellent method of ensuring that you optimize the time spent in discussing your work with your supervisor. It also ensures that you maintain contact with others who are interested in you, your work, and how you spend your time. One of the major dissatisfactions with the lifestyle of a research worker is the perception that nobody else either understands or cares about what it is that the researcher is doing. This leads to almost complete isolation and a feeling that perhaps it really isn't worthwhile after all. An effective means for combating this and, in addition, gaining helpful input into your work is to keep one or two other people in close touch with what you are doing.

These people can be other academics, research students with whom you form an exchange self-help relationship, or they can be significant people in your life. The best way of keeping them in touch with what you are doing is to talk about your work from time to time. Surprisingly, you avoid the risk of becoming boring and making your work dominate the relationship by offering drafts of written work for them to read and comment upon. This has two benefits: it allows you to spend the rest of your time together on other topics of conversation; and it boosts their morale to think that somebody who is doing a PhD values their opinions. What this means is that you must be prepared (and willing) to accept criticism from your peers as well as your supervisors and others in more senior positions than you. Hopefully, the feedback will be constructive and you will be able to select from it those points which seem to you to be of help. This might be in rethinking an idea, restructuring some paragraphs or generally clarifying items that were not initially well presented by you because of your close association with the draft.

Supervisors expect to have regular meetings with their research students

Regular meetings can occur daily, weekly, monthly, termly or even half-yearly. The more frequent the meetings, the more casual they are likely to be, helping to create a climate for discussion. Formal tutorial meetings are less frequent and need to be carefully prepared on both sides. Norms for how often meetings happen vary a lot between individuals and between disciplines, but most commonly supervisors expect to meet with their research students every 4–6 weeks. It is a good idea to discuss the frequency of meetings when you first agree the kind of student–supervisor relationship you are going to have. We have already considered (in Chapter 2) the advantages and disadvantages of more and less frequent meetings. It is important to establish a routine that is satisfactory for both your own and your supervisor's way of working.

Regardless of the frequency of meetings, it is important that meetings are held on a regular schedule. Agreeing to meet 'when there is something

to talk about' is a recipe for disaster, because one of the roles of the regular meeting is to provide a steady set of deadlines and review points for work – both for the student and the supervisor. Whilst on occasion meetings will have to be cancelled because of unanticipated issues, it is important that meetings happen regardless of whether student and supervisor feel there is something substantive to talk about. Even a quick five-minute catch-up can provide an opportunity for you to ask for clarification on a relatively minor issue that you wouldn't bother arranging a specific meeting about. Furthermore, a regular meeting can reassure the supervisor that steady progress is being made, even if there are no significant issues to talk about.

Your supervisor has to fit tutorial meetings with you (and other postgraduates) into what is probably an already full work schedule. In order to be of most use to you, your supervisor will have had to spend some time prior to the meeting thinking about you, your research and any problems connected with it, reading anything that you have written and preparing a focus point for the tutorial. For you to get the best out of your supervisor, it is essential that you allow ample time between setting up the meeting and the actual date. It is a good strategy to agree dates for the next tutorial during the course of the previous one. It is also important that you do in fact turn up at the appointed time and date. If you are late, it produces additional difficulties for the meeting. Either it will be cut short or your supervisor will be worrying about work that should be attended to but is being neglected because of the time given to you. If you cancel a meeting at short notice, the time and thought that your supervisor has already invested in it is wasted, nor does it augur well for your future relationship or the seriousness with which future meetings will be treated.

A very important part of managing your supervisor is to set a good example. If you find that your supervisor is not as exemplary as the above model suggests, you can provide encouragement by behaving in an exemplary manner yourself. By doing so you demonstrate that you expect tutorials to be well prepared and treated with equal respect on both sides. You may even wish to phone, text or email a day or two before the planned meeting to confirm with your supervisor that everything is in order and to ask whether there is anything else you should be thinking about or preparing that may not have been mentioned previously.

A tutorial meeting with both your supervisors should be structured in the same way that any formal meeting is structured. There would be an agenda to which you have all contributed prior to the date of the meeting. This agenda may include:

- a review and summary of what was agreed at the previous tutorial;
- a discussion of how you have progressed;
- comments from your supervisors concerning any work already submitted;
- your response to this feedback;

- possible comments from your supervisors regarding observations of you in action, e.g. conducting an experiment, interview or contributing to a seminar;
- checking that you have all covered everything you wanted to in this tutorial;
- securing agreement of how you should proceed between now and the next meeting;
- setting the date and time of the next meeting;
- making a summary of the meeting for the file and to form a starting point for discussion at the next meeting.

This last agenda item is very important and you should be looking for a clear plan of what to do next. At the end of the tutorial, be sure that both you and your supervisors have noted and e-mailed what has been agreed as the next stage of the work. This is more environmentally friendly than paper notes and the information will be automatically dated and so provide a demonstration of your progress.

Supervisors expect their research students to be honest when reporting on their progress

Supervisors are not idiots – at least, not many of them – and they are not fooled by absent students who leave messages saying that everything is fine and they will soon be needing a meeting or sending in a written draft. Neither are they taken in by the student who does put in an appearance from time to time, talks volumes about work in hand, new ideas and the next steps about to be taken in practical work, and then disappears again, never submitting anything tangible in the form of precise figures, graphs, experimental results or, of course, written work.

Furthermore, most universities now require PhD students and their supervisors to keep regular written records of their progress, and to have regular progress meetings with a supervisory panel. Even if you are managing to fool your supervisor, your lack of progress will soon be revealed when you have to do a more structured, formal presentation of your work at such a progress meeting.

If there is a problem, if you are blocked, if you have lost confidence, if you are experiencing domestic troubles of whatever kind, or if anything else at all is interfering with the continuation of your work, then do let your supervisors know about it.

Supervisors expect their students to follow the advice that they give, especially when it has been given at the student's request

Now this really does seem to be a most reasonable expectation, yet it is surprising how often it is contravened. For example, when Bradley asked

whether his reading was going along the right lines, Mrs Briggs told him that he needed to know the romantic literature. She explained that it was not enough to know the area only through two writers. But Bradley decided to concentrate on four works and read them thoroughly and carefully, rather than following up a lot of leads at the same time. He could not see the point of reading the works of other authors when his PhD was to focus on a specific work of a specific writer. In other words, he had not received the answer he was hoping for when he requested the advice – and so ignored it.

This upset Mrs Briggs. She had believed that she had an excellent relationship with Bradley, but she now interpreted his behaviour to mean that he had no respect for her as a supervisor. She felt unable to work with a student who believed he knew what was best regardless of having asked for guidance and so requested that he be transferred to someone else. The result of this was that Bradley wasted a year trying to find another academic who was competent in both Italian and English literature. When he did find a new supervisor, she looked at what he had done to date and then, just as Mrs Briggs, recommended that he familiarize himself more widely with the romantic literature!

Supervisors expect their students to be excited about their work, able to surprise them, and fun to be with!

If you are not excited about your research, who else will be? How can you expect to arouse anybody else's excitement, enthusiasm or interest? When postgraduates are really excited about what they are doing, it stimulates those around them. Excitement is infectious. It works to the advantage of the student concerned if other people want to know what is happening and encourage conversation around the research. It is invigorating to be in the centre of a hub of energy and enthusiasm. There is a world of difference between working away for the sake of getting on with something (in an environment where there is little communicable interest in what is happening) and wanting to tackle the next task because of the desire to push ahead and then let everyone else know about your progress.

Of course, there is a line to be traversed here between becoming unbearably boring and pompous about what you are doing and maintaining that element of excitement. If you succeed in maintaining this level of motivation, then not only will your postgraduate days be days of enjoyment and anticipation, but you will also have a head start on managing your supervisor to fit in with your own ideas of how the relationship between you should operate.

Being able to surprise your supervisor stems from the fact that, if you are to be successful, it should not be too long before you know more about your area of research than your supervisor does. To be awarded a PhD means that you must have become expert in your research topic. Therefore,

although your supervisor is an expert in closely related areas, such expertise will fall short of the depth and detail on your own topic that you yourself are now developing. For these reasons, your supervisor will expect to be constantly surprised by new information, evidence, and ideas that you are able to supply. Supervisors do not expect to be shocked by their students' failure to conform to a professional code of conduct, or a moral approach to their subjects. To manage your supervisor successfully, be sure that you steer a course between surprising them and shocking them.

Be fun to be with! Perhaps you think this is asking too much, but just imagine how much more enjoyable your own work is when you actually like the people with whom you are working. Three years plus is a very long time indeed to spend with somebody who makes you feel ill at ease. In other words, it is wiser to select your research topic to match the supervisor of your choice, than to select your topic and then be allocated to the relevant academic specialist. Just as you may take an instant dislike to somebody, so too may your supervisor. It may not be as extreme as that, of course, but doing a PhD is an intense and emotional experience that extends over a long period of time.

What this means in interpersonal terms is that any irritant, no matter how minor it may appear in the beginning, becomes exaggerated and distorted over time until it is well-nigh intolerable. This works in both directions so that your supervisors' expectation of enjoying the time they spend with their students has its payoff for you too. It is not that you have to spend your time thinking up witticisms and novel ways of entertaining supervisors, in the hope of being invited to spend more of your out-of-work time with them and their social group. It is merely advisable to follow the instructions given in Chapter 2. If you have chosen your supervisors carefully and discussed the way that the supervisory relationship will work, then you have an advantage over students who have not gone to this trouble.

Like any relatively long-term relationship, the one that you have with your supervisor will change over time. If you begin cautiously then you increase the likelihood that the two of you will gradually grow to appreciate each other and so get to the point where you might even discover that you, too, expect your supervisor to be fun to be with. You might even find that in working well together, you manage to have fun too.

The need to educate your supervisors

We have already discussed the importance of keeping your supervisors informed of new developments and findings as your work advances. Earlier in this chapter we mentioned that you will gradually become more expert, better informed, and perhaps more skilled in specific techniques, methods, and areas of investigation than your main supervisor.

Managing your supervisor efficiently involves an educational programme as well as a training course. The training course involves fulfilling the expectations of supervisors and moulding them to fit with your own needs and requirements. The educational programme need not be so subtle, as it is more acceptable to acknowledge that you will know more than your supervisor about your research topic, given time, than it is to admit that you have a supervisor who does not know how to supervise effectively. Nevertheless, it is recommended that you enhance the education programme by presenting information to your supervisor in as surprising and stimulating a manner as you can, thus maintaining an optimum level of excitement about your findings. All this will help to make you fun to be with too.

So much for the style. The content is important and not quite as uncomplicated as it may at first appear. You might find yourself in murky waters if you assume too little knowledge on the part of your supervisor or, alternatively, if you show that you have realized from your discussions that there are gaps in your supervisor's knowledge of the specialist field. It is fine to mention any new findings that are a direct result of your research, and indeed they must be mentioned in order to demonstrate the progress that you are making. Any readings or discussions with others that teach you something that you did not previously know may also be mentioned easily to your supervisor. But beware of doing this in such a way that it becomes clear you believe that your supervisor was also unaware of this information. In other words, it may be necessary to educate your supervisor by giving information in a manner that assumes that your supervisor already knew about the things that are only now becoming accessible to you.

Such measures will become less necessary as time passes and your own work becomes more advanced. You will find, if you have handled the situations described here sensitively, that your relationship with your supervisor has changed from one in which he or she is guiding or directing your work to one where you are in control of what you are doing. Instead of being someone from whom you need information and approval, he or she gradually becomes someone with whom you can discuss new ideas and develop your thinking. You will be more inclined to use your supervisor as a sounding board, as an expert with the ability to proffer the reverse argument to be countered. Instead of a teacher, the supervisor becomes a colleague and the relationship becomes less asymmetrical than it was. In fact, this is the kind of relationship that you should be working towards with your supervisor.

If you have specialized in a particular technique or method, it could be that your supervisor will not be able to test or replicate your investigations without considerable new learning and practice. It will then be more likely that your own findings and results will be accepted as correct, even if they seem doubtful, than would otherwise be the case. In such circumstances, your reasoning as to why you think you got the results you did should

become an important focus in your discussions. Your interpretation of the evidence will also have to stand up to very strong inspection. All this is to the good because it gives you practice in arguing your case, which is an essential skill both for your viva and for any conference papers and seminars that you give on the topic.

The learning that goes on in such a situation is very much two-way. You learn from your supervisors what kinds of questions are important and how to respond to them; your main supervisor learns from you about the new methodological development and how it might be expected to affect the discipline.

Once your supervisors see that you have confidence in what you are doing and begin to respect your work, it will become easier for you to educate them. Supervisors do benefit from having research students and they are aware of the role these students have in keeping them, the busy academics, in touch with new developments and at the forefront of knowledge in their field. All you have to do to keep your supervisors onboard throughout the whole period of your research is to ensure that they are aware of what you are discovering, more or less as you are discovering it.

If, at this stage, you feel for any reason that your supervisors are not taking your work as seriously as you would wish, a good tactic is to ask whether your report, etc. warrants presentation at a conference. This makes it more likely that the work will then be fully evaluated.

How to reduce the communication barrier

It should be clear by now that it is necessary for you to educate your main supervisor to become the kind of person that you find it easy to talk to. It should also be clear that there are a variety of ways in which you can begin to do this. Some of them have already been mentioned, but now let us look at them a little more closely.

It is first necessary to realize and remember that there is usually a difference between what supervisors actually do and what their students think they do. For example, the time that supervisors allocate to their students includes time given to thinking about you, the student, as well as the obvious time allocation needed for reading what you write and the tutorial meeting.

It is important to show that you are aware and appreciative of the hidden time and effort that your supervisor gives to you. Showing your appreciation of this will make it easier for you to talk to each other more frankly, not merely gearing the conversation to purely technical matters. In fact, all too many supervisors feel that in discussion they need to keep closely to the actual work, thus avoiding the all-important PhD process – which includes your relationship. They may not have any experience of discussing openly and freely what they perceive to be ‘personal matters’.

An example of this is apparent with Professor Andrews and Adam. The supervisor said of their tutorial meetings, 'He always seems to go off in a more contented frame of mind than when he arrives', while Adam reported, 'I haven't found a way of telling him how very frustrated I am with these meetings'. Here we have misunderstanding and a clear breakdown of communication between the two of them. The misread signals resulted in the student being unable to follow any advice that he was given. This is partly due to the student's disappointment that Professor Andrews did not say what he, Adam, wanted him to say but merely assumed that everything was in order between them. If Adam had been better at managing his supervisor, he would have told the professor how he felt, which would have opened up the way to a more honest and trusting relationship between them.

Another potential difficulty arises if any of your supervisors are from another country and foreign to the UK system. For example, the American PhD system starts with taught courses and research only really starts as a serious part of the work in the third year. Or, one of your supervisors may have come from an EU country where the final viva is a very different ceremony to that which we have here. Usually, such differences are readily understood and 'taken on board' by new members of staff, and it would be a rare circumstance where you, the student, would have to address such a problem. If you think, however, that your supervisor is not grasping this, then you need to discuss it with them. A more pressing concern is where a supervisor has not worked in the UK before, and so is not familiar enough with the PhD standards required – especially as British standards are different from those in the USA and Europe. This would normally be picked up in a progress review meeting, but if you have concerns about this, then you may need to go to the head of department or research tutor for the department.

Finally, if one of your supervisors speaks English with a heavy, difficult-to-understand accent, you may find that you *do* need to put an item such as 'improving communication' on your tutorial agenda. Such an explicit statement of the problem will be preferable to constantly finding yourself requesting your supervisors to repeat what has just been said.

Improving tutorials

Encouraging very broad-ranging discussions between you and your supervisors will help reduce the communication barrier. We recommend that you, the student, take responsibility for what you want to get out of your tutorials. As suggested above, it is a good idea to enter a tutorial with a proposed list of topics for discussion. If necessary, ask your supervisor for items so that a joint list of what to cover can be agreed. There are almost always misunderstandings to be clarified.

The way to get your supervisors talking about what may be perceived as taboo topics is to ask direct, but positively constructed, questions

revealing that you are assuming good intentions on their part. It is always a good idea to start from a general question that is not focused directly on the actual work, but neither should it be too personal too soon. For example:

- Am I making enough use of the learning opportunities available?
- Do you think that I am managing to get enough work done in the time between our meetings?
- Are you satisfied with how I use your comments?
- Are you satisfied with my attitude towards your supervision of me?
- How do you think we might work together more effectively?

Such a series of questions should lead naturally into a conversation about the relationship itself. If supervisors do not feel unfairly judged, they will be more open. There will be no need for either of you to use defensive tactics, such as hiding behind technical details.

A further component in reducing the communication barrier with your supervisors was described in Chapter 2. Discussing your expectations and hopes for the working relationship between you is of prime importance. If you agree informally the amount and type of contact that would be acceptable at different times during the course of the work, you will have an effective basis for discussing any deviations. Your needs change over time, so you should review this at agreed intervals, probably annually. With such an understanding, it is also easier for any of you to request a change if the relationship is not working well.

In Chapter 8, we discuss the importance of deadlines. Here again is an important step in managing your supervisors. You must ensure that every time you leave a tutorial meeting there is another one agreed and written into your diaries. It is less important how near or far into the future the next meeting is; what is vital is that a date should have been fixed on which you know that you have to meet your supervisors again.

Developing your assertiveness skills

One of the skills you need to develop is how to ask for a change in your supervisory relationship. It is easy to identify a problem: you might be struggling to understand your supervisor's accent, to comprehend the task that they are recommending to you, or you might want to change your methodology. The difficult part is plucking up the courage to ask.

The first thing you need to do is to develop your assertiveness skills. Being assertive is not the same as being aggressive. Assertiveness means expressing your thoughts, emotions, beliefs, and opinions in an honest and appropriate way, and respecting those of others.

Assertiveness allows individuals to state their personal rights without undermining the rights of others. Assertiveness is a balanced and self-confident approach, being neither passive nor aggressive. To be assertive, you see yourself and the other person as adults and emphasize the mutual benefits that you will get from having an open discussion about the issue at hand.

The three core aspects of assertive behaviour can be summarized as being:

- *Confident*: believing in your ability to handle the situation and achieve change.
- *Clear*: communicating the message in a way that is clear and easy to understand.
- *Controlled*: asking for the change/information you want in a calm and controlled manner.

One way to achieve this is through statements that are focused on your thoughts and feelings, rather than blaming the other person. Such statements typically begin 'I …' rather than 'You …':

- 'I feel frustrated when I can't understand what you are saying, because of your accent. Perhaps we could …', rather than 'You have an incomprehensible accent'.
- 'I'm not making the progress that we both want to see because methodology X isn't working on this problem. I'd like to have your advice on using methodology Y instead', rather than 'You've been telling me to use methodology X and that's wasted months of my time'.
- 'I don't understand how to use technique Z because it wasn't something that I studied in my degree. Could you explain it to me in detail, or ask one of the postdocs to go through it with me?', rather than 'How on earth do you expect me to use technique Z?'

This helps to avoid the other person becoming defensive, and puts the emphasis on a productive way forward rather than apology and blame. Emphasize your confidence by maintaining eye contact, if that is comfortable for you. Demonstrate that you are actively listening to the other person by summarizing what they have said to you. You can use phrases such as, 'So if I'm hearing you correctly, your view is …' or 'So you're saying … is this right'. Ask the other person for advice rather than making a criticism.

One aspect of discussing topics in an adult-to-adult way is to assume that you both have sensible reasons for your opinions, and that an aim of the discussion is to understand the rationale for those opinions. Rather than assuming that the other person is mistaken, explore the reasons why they have that point of view. Perhaps they have misunderstood your motivations;

perhaps they are under pressure from elsewhere to meet a deadline. If you can understand one another's motivations, that will help you to reach an agreement.

As well as being assertive, an important part of asking for change is to structure the request in such a way as to increase the chance of a positive response. It might be a good idea to send an email in advance of the meeting saying that you would like, for example, to discuss a change in the methodological direction of the project. Make it clear if you think that this is going to be a difficult conversation. This allows your supervisors both to prepare in their mind for the conversation, and allow sufficient time for the meeting. The last thing that you want is to arrange a meeting expecting to finally talk about the issue that has been nagging away for months, only to find that your supervisors are rushing to finish because they have to get to another meeting in twenty minutes.

If this is all too difficult to do alone, you can always enlist help from others. Practise the conversation with a friend or family member. Ask your student union for advice. Many student unions have a dedicated postgraduate advisor. You might take another person with you into the meeting to give you support, but make sure that you take the lead in speaking. This can change the dynamics of the meeting – arriving at a meeting with a student union advisor in tow can have the accidental effect of turning a regular meeting into something with more of the feel of a complaint. In the end, though, if this will give you the confidence to approach the issue, then it might be for the best, but be sure to make your supervisors aware that that is what you are going to do.

Improving feedback

We have seen how essential it is for you to receive effective feedback, so do make sure that when the date fixed for a meeting arrives you help your supervisor to make the most of the time available. Once again, ask the right questions for eliciting the information that you need. If your supervisor says, 'This section is no good', you should respond – tactfully, of course – with 'What precisely is wrong with it?' It may be that the grammatical construction is unacceptable, or that the conceptual design is misleading or confused, or that the section is irrelevant, or any of a dozen other things. You have to establish exactly what it is that is being criticized and what you can do about it to put it right. You may need to omit the section completely, or move it to another part of the report, or rewrite it, or rethink it before rewriting it. You must help your supervisor to express clearly, and with as much information as possible, what it is that is wrong. Once you have the information, you will be in a position to do something about it. You might want to discuss it further, and perhaps disagree; or persuade your supervisor of the correctness of the point you were trying (but apparently failed)

to make. You don't need to worry about criticizing your supervisor's ideas if what you say is in a non-aggressive form. The style is to suggest an alternative way of proceeding that should be considered. The important thing is to have a stimulating discussion and to come to a conclusion acceptable to both of you. You then have the responsibility to carry out what was decided.

Be sure to make a short summary of what occurred during each tutorial. This note should be e-mailed and filed. In this way, all can refer to what has been agreed, and have a continuous record of how the work and the supervision is progressing. There are several advantages to this systematic method of keeping track of the development of the research process. The student has an *aide-mémoire* of what was discussed. Ideas suggested by a supervisor are less likely to be forgotten, and work agreed to be done in preparation for the next meeting is recorded. For the supervisor, the summary serves as a reminder of the work of that particular student, thus greatly reducing confusion if they are supervising more than one. In addition, if, unfortunately, any serious dispute arises between you and your supervisors, the summary can be used as evidence of what has been taking place.

It may even be necessary for you to help your supervisor to understand what doing a PhD means to you. For example, Mrs Briggs contrasted working on a PhD unfavourably with writing a book; she thought of it as preparation only for becoming a university teacher through creating and concentrating on artificial problems. However, as we have explained, a PhD is a thorough training in doing research and learning the criteria and quality required for becoming a fully professional researcher in a chosen field. It admits the holder to a club in which you are recognized as an authority and accepted as a person who is knowledgeable enough in a specialized area to be able to extend the boundaries of the subject. You will also be in a position to demonstrate the transferable skills you have acquired in different professional situations.

If your department is in the unusual position that it does not have regular postgraduate seminars, you might suggest introducing them. They should take the form of a meeting in which you and other postgraduates can discuss your ideas for research and the problems encountered along the way. A meeting of this kind will make it easier for you and your supervisors to talk to each other on subjects not directly connected with the minutiae of your research.

Finally, if you want to succeed in managing your supervisor, you have to ensure that you do not make excessive demands and become a nuisance. Always speak honestly about anything that is bothering you and be direct in your requests and your questions. Take the responsibility for keeping the lines of communication open, because it is you who have the most to lose when misunderstandings and communication breakdowns occur. Try to make the relationship with your supervisors as far as possible a shared, if inevitably asymmetrical, partnership.

Changing supervisors

If you feel that the relationship with your main supervisor is not developing satisfactorily, you might have to consider a change. We are not referring here to changes of supervisor for extraneous reasons (for example, your supervisor takes up a post in another university) but rather when you wish to initiate a change. In this section, we focus on changes that arise from a clash of personalities, or a shift in the topic or methodology of your project. Change motivated by bullying or abusive behaviour on the part of the supervisor is discussed in Chapter 9.

There is usually a formal mechanism that allows for the possibility of such a change, but it cannot be emphasized too strongly that this is a course not to be undertaken lightly. In the very early period of the research, during the first few months of establishing more precisely your common areas of research interest, an obvious mismatch of interests can often be rectified relatively easily. But a change made after that period, or made for any other reason, requires considerable heart-searching.

A change of supervisors is the academic equivalent of getting a divorce. There are the formal (legal) mechanisms for doing so, but the results are achieved inevitably only after considerable emotional upset. There are important consequences for the supervisor's professional status and self-esteem if a student initiates a change. Thus it is bound to be a difficult process, one that often ends with metaphorical blood on the walls.

The important key to the process is to ask a third party to mediate. Such a person might have the title sub-dean for research, convenor of the doctoral programme, chair of the higher degrees committee, or research tutor – the title will vary, but it will be a person who takes responsibility for the system of doctoral supervision as a whole. In the unlikely event that there is nobody specifically allocated to this task, then it is always possible to approach your head of department, who has overall responsibility for the academic working of the department.

The importance of the third party is in helping to improve communication so that both you and your supervisor get a better understanding of the problems. This role is also vital to finding ways of getting your current supervisor to accept a change, if that turns out to be necessary, without feeling too damaged by it. The third party is also essential for offering advice on, and making preliminary contact with, a new supervisor. The relationship between your old and your new supervisors, as departmental colleagues, will be preserved more easily with the help of the third party.

> Nick was interested in working in a certain field of management operations in which research is not yet well developed. In his first year he attended seminars given by doctoral students across the whole range of management research. After some months he began to feel that his

supervisor, Dr Newman, was not really directing the advice she was giving him to the sort of research approach he observed in his colleagues. It was far more discursive and descriptive than the analysis his peers were engaged in. Dr Newman, on the other hand, felt that Nick was neglecting her advice on how to proceed, because he did not want to put in the groundwork to make himself knowledgeable about the field. In her view, this was more important than the methodology.

Like so many students and supervisors in their position, they carried on for the whole of the first academic year with this uneasy relationship: Nick thinking that Dr Newman didn't really understand research, and she thinking that Nick didn't really want to do research that was worth doing in relation to her field. Towards the end of the year, the director of the doctoral programme became aware of this mutual dissatisfaction, and in discussion with both of them separately the possibility of transfer to another supervisor was considered.

Dr Newman believed that Nick would never carry out any research in her field anyway, so somebody else might as well have him. The proposed new supervisor was prepared to take him provided Nick was willing to start again from the beginning. The change was accomplished because the third party took the initiative in making all three aware of the relevant issues. Nick had lost a year in getting it all sorted out, but did indeed eventually obtain his PhD in the new field. Even so, Nick and Dr Newman avoided each other, literally not exchanging a word, for the remainder of his time as a research student.

It is possible, however, to achieve a change of supervisor more smoothly. An academic can be added to the supervisory team, and this person can share the supervisory load, or even take the main role, without the original supervisors feeling completely rejected.

Ho Mei was a student who came to this country to study for a doctorate in development economics. She was sponsored by the Chinese government; the first time that the Economics department of her university had accepted such a prestigious student. This led the head of department, Professor Marks, herself a development economist, to decide to be the main supervisor. An econometrician was appointed as the second member of the panel to give him supervisory experience, as he had not had any before. He could give general economic and mathematical advice, but was not a development specialist.

Coming into this new environment from abroad, May (as she was called by her colleagues in Britain) accepted this supervisory arrangement gratefully. But she found that as the first year progressed, it became more and more difficult for her to accept the approach that Professor Marks was strongly pressing her to adopt. May felt that this was overly

formal and not linked closely enough to practical economic decisions, which was her motivation for doing the work.

Over the year the tension between them built up and became obvious to the departmental research tutor. He felt that May was not working as well as she was capable of, and wondered whether the tension reflected the fact that both the supervisor and the student were female. He did not feel that he could ask Professor Marks to step down as a supervisor as this would be too public a failure. But he seized on the fact that for a period her administrative role made particularly strong demands, to suggest that Dr Maheshwari, another development economist, should be added to May's supervisory team. Professor Marks agreed to this, rather reluctantly. Over the months following this decision, May consulted more often with Dr Maheshwari than Professor Marks and felt she could now shape her research in the direction she wished to go. Formally both remained her supervisors, but after a while, Professor Marks recognized that May's interaction with Dr Maheshwari was becoming more productive and she accepted a more restricted role.

Inappropriate personal relationships in supervision

There are regulations in most institutions that preclude friends or family members from being supervisors or examiners of PhD candidates. At minimum, such relationships need to be declared to a designated person (such as the head of department), who can decide on how to mitigate any conflict of interest that might emerge. Regardless of what regulations are in force in your university, we would also urge you to avoid developing an amorous relationship with your supervisor. In Chapter 9, we discuss the situation where a supervisor puts unwelcome attention on a student to form a romantic or sexual relationship. In our opinion, even developing a consensual relationship would be unethical.

The problem is that the role of supervisor and the roles of parent, spouse, partner or lover are to a considerable extent incompatible. In the first place, the supervisory role inevitably involves a considerable amount of professional criticism, hopefully constructive, but criticism nonetheless. This is most effectively given in a purely professional relationship. If there are many non-professional ties of a personal and emotional nature, the student is much more likely to be upset by criticism or, conversely, to become more and more dependent. In either case, the intended development of the student into an effective, fully professional, independent researcher becomes more difficult.

Second, a close personal relationship with the supervisor may well disrupt the student's other relationships in the department. For example, the

student may find that others, students and staff alike, may be reluctant to involve themselves so that the student becomes disadvantaged through lack of discussion and other learning opportunities. This reluctance will likely result from others feeling uncomfortable, in that any comments they may make about their own experience in the department will probably find their way back to that particular supervisor. What might have been the development of new friendships will be curtailed, and even day-to-day interactions and collaborations can become viewed by peers and staff as professionally dangerous, if the student is considered to have a special line to a high-status supervisor.

We firmly believe such a situation is to be avoided, as much for the sake of your personal relationship as for the progress of the work and your interactions with peers. The medical and psychological professions regard amorous relationships between practitioner and patient or client as seduction. Similarly, there is a clear argument for romantic involvement between supervisor and student to be treated as a violation of ethical professional conduct.

Chapter 7

Writing your PhD

Action summary

1. Do not think that all the writing can be done at the end. If you do avoid writing, you will not develop the skills to write efficiently, or even adequately, for your thesis.
2. Take every opportunity to write reports, draft papers, criticisms of others' work, etc., during the course of your research.
3. Allocate times to writing and stick to those times.
4. Write your thesis in readable English, using technical terms as appropriate but avoiding jargon.
5. Understand the form and structure of a PhD thesis, and make sure that your thesis has adequate content in all components from the literature review through to the final evaluation.
6. Do not make your thesis (i.e. the research report) any longer than it needs to be to sustain your thesis (i.e. your argument).
7. Develop a purposeful strategy for improving your writing skills, whether through attending writing courses in your university or by engaging with writing support networks.
8. Get feedback from colleagues and then supervisors to help you improve your writing and rewriting.
9. Write your final thesis in the order that is easiest for you. It does not have to be written in the order in which it will be read. The methodology section is often a good place to start.
10. Find out about opportunities for writing journal and conference publications in your field.
11. Become aware of the value of open access to theses, papers, and the wider open research movement, and take opportunities to make your work available where appropriate.

In this chapter, we examine the task of writing your PhD. First, note that we do not say 'writing *up* your PhD': that formulation wrongly gives the impression that writing is what you do at the end of the process. You certainly do have to write up your results at the end, as we show in the diagram on page 149, but as the diagram also shows, that is only part of the writing activity. One of the skills that you have to acquire in order to become a fully professional researcher is that of being able to communicate your contribution effectively by writing and presenting academic material to the appropriate standard (see p. 31). As with all skills, you need practice in doing this, so writing becomes an important part of your research activity from the beginning.

What to write

Students often find the task of writing difficult and, indeed, try to postpone the evil day. Well, it *is* hard graft and most writers admit that. A common beginner's reaction is the feeling that 'I don't really have anything to write; my ideas are not good enough yet to write down'. But this is not the case. There is never any shortage of issues to write about at all stages of your research. If you start writing early on, then you will build up a collection of documents that you can draw on when it comes to your final thesis. This will also help you to develop your writing skills to a good standard.

So, what should you write about? In the beginning, there will be much reporting through reviews of relevant literature. Subsequently, there will be analysis through detailed critiques of previous studies. Then come the more creative elements in your own research proposals, alternative designs of the investigation, and so on. Later comes development of hypotheses, and evaluation of the data collected. At any point you could always attempt the first draft of a chapter in your final thesis, the structural form of which we will discuss below. The details of the topics chosen will vary with the subject and should be agreed in discussion with your supervisors.

Our advice is always to be writing something during your time as a research student. In the last stages of your research, when you finally get to writing *up*, tackle the easiest parts of the thesis first. This may sound obvious, but it is surprising how many people believe a thesis should be written in the order that it will be published and subsequently read. Not true. A thesis is not a diary.

In an article entitled 'Is the scientific paper a fraud?', Medawar (1963) explains the process of writing up research as an exercise in deception. By this he means that readers are deceived into believing the research was conducted in the way it is described and the report written in the logical and sequential manner in which it is presented. He maintains that this is misleading and might be discouraging to others who wish to conduct

research and write scientific papers, but who find that nothing ever happens quite as systematically for them as it seems to do for the experts.

Consider writing the Method section first. You know what you did and how you did it, so it is a good way of getting started on the thesis, even though this chapter will appear well into the body of the finished work. Alternatively, you may prefer to start with the literature review, which is a safe way of reminding yourself of what has already been written about your topic. If you do start here, remember to check at the end of your work for important subsequent publications.

Don't be afraid of throwing away sections of writing and starting them again from scratch. The first attempt at writing about a particular topic is often valuable, not for the words that you put on the page, but because it clarifies in your mind how to organize the topic and what language to use. Having done this, you might well start that section again, informed by what you learned the first time you wrote it, but not burdened by the details of that scrappy first draft. The author Iain Banks said that he had written 'a million words of rubbish' (BBC, 2012) before writing his first published novel. But, writing all of those words had laid the foundations for how he used language in his subsequent novels. We wouldn't expect your first attempt at carpentry or painting to be particularly successful; instead, we'd expect you to attempt a lot of small pieces first to learn the craft of working with wood or with paints. The same principle applies to writing.

The form of a PhD thesis

Three of the key ways of not getting a PhD that we discussed in Chapter 4 involve students or their supervisors (or both) not understanding the nature of a PhD degree. To demonstrate that you are a competent researcher requires that you conduct your research in such a way as to satisfy the examiners (i.e. your senior professional peers) that you are in full command of your academic field.

This you do by 'making a contribution to knowledge'. This sounds both very impressive and extremely vague, something students can find to be both intimidating and worrying. We shall examine what form of a PhD thesis will satisfy these requirements. Underlying the discussion is the understanding that the PhD is a theoretical enterprise. Even if you are studying a very practical problem, you have to put it within a theoretical framework. Just solving the problem, great though that would be, is not sufficient to be 'making a contribution to knowledge' for the PhD. For your PhD contribution, you must develop, or add to, the theory explaining why your solution works.

University regulations for a doctorate apply to all fields of study, from Arabic Studies to Zoology. Thus, they are inevitably formal and are not

able to catch the particular requirements in your field at this time. Indeed, the aim of the training process is precisely to put you in a position where you can evaluate what is required, in addition to being capable of carrying it out.

There is, however, a certain *form* to doctoral theses – clearly at a high level of abstraction, since it has to be independent of the content and apply to all fields of knowledge. We may think of the analogy of the sonata form in music. This is a structure of musical writing, but it tells you nothing about the content. Haydn wrote in sonata form, but so did Lennon and McCartney. The range of content covered is therefore enormous, *but* the sonata form does not cover all music. Neither Debussy nor Britten used this form. In jazz Scott Joplin used sonata form but Bix Beiderbecke did not. The same is the case with the PhD. It has a particular form and since not all research conforms to it, you have to be aware of what the elements of its form are.

There are five elements to PhD form that we have to consider: research field, research topic, research methodology, research contribution, and research evaluation. These analytical constructs run throughout the thesis and do not have to correspond directly with the chapter headings used. They have to be covered in the thesis as a whole, however, as they are the headings under which its worth is evaluated.

Research field

This is the field of study within which you are working and which you must know well – that is, to full professional standard. So, you must be aware of the present state of the art: what developments, controversies, and breakthroughs are currently exciting or engaging the leading practitioners and thus pushing forward thinking in the subject. You will also need to show how the field reached its current state; how far back you will need to go will depend on your subject and you should take your supervisor's advice on this.

The standard way of demonstrating this is by writing a literature review, which will form an important and integral part of your thesis. Remember that you are not doing a literature review for its own sake; you are doing it in order to demonstrate that you have a fully professional grasp of the research field in which you are working. 'Professional' means, as we saw in Chapter 3, that you have something to say about your field, which your fellow professionals would want to hear. Thus, organizing the material in an interesting and useful way, evaluating the contributions of others (and justifying the criticisms, of course), identifying trends in research activity, and defining areas of theoretical and empirical weakness, are all key activities by which you would demonstrate that you had a professional command of the research field.

It is important to emphasize that a mere encyclopaedic listing in which all the titles were presented, with only a description of each work, and no

reasoned organization and evaluation would not be adequate. It would not demonstrate the professional judgement that is required of a PhD. It would be the equivalent of your taking a driving test and driving at no more than 20 mph throughout. Even if you made no mistakes during the test, you would fail because you had not demonstrated sufficient confidence and competence to be in charge of a vehicle. As a PhD, you must similarly be confidently and competently in charge of your understanding of the research field in which you are working, and you have to demonstrate this through the literature review. Remember, too, the advice that we gave in Chapter 5 on taking a critical and analytical approach to your research. The literature review is the main place where you demonstrate this criticality and analysis in your thesis.

It is important to bear in mind the reader of your PhD when writing the thesis. One student wrote 200 pages of literature review, surveying their subject from pre-history to the twenty-first century. Whilst very interesting, this detracted the focus of the examiners from that student's contribution. There is no need to explain the entire history of your subject, or to explain the basic theories and ideas. It is useful to think of the literature review as bridging the gap in knowledge between what a well-educated scholar in your broad area of study would know, and what they would need to know to read the remainder of the thesis. By keeping this audience in mind, you can make an informed decision about what references to include.

Imagine that another PhD student or an academic in the field wished to understand your thesis. What books and articles would they need to read to be in a position to do so, and what would they need to get out of reading that material? How you discuss the research literature should point towards your original work later in the thesis. You are not providing a general discussion of the material that you have read, but one that points ahead to your original contribution.

A good literature review will make it obvious to the reader why the arguments you make in the rest of the thesis are important: the literature review marks out a 'thesis-shaped hole' in the research literature, which you are intending to fill.

It is good practice to start writing a literature review early in the PhD process, so that you can record your thoughts whilst your early reading is still fresh in your mind.

Bear in mind the advice that we gave about effective note-taking in Chapter 5. Indeed, most universities formalize this by making a literature review one of the primary documents that you need to produce for a progress review at, say, the end of your first year of study. However, you should not regard it as complete at this stage. You will want to revisit it once you have done the main body of your research, both to make it particularly relevant to your work and to include later publications.

In many disciplines, you can get a good idea of the style and standard required by reading literature surveys in relevant journals. The *Annual*

Reviews of biochemistry, sociology, etc., contain such reviews of the research context of parts of the discipline. In many subjects, there is a quarterly journal devoted solely to reviews of the current research status of its sub-fields, contributed by leading scholars. Remember also that much new information is now available through blogs and social networks, which include up-to-the-minute reports of work currently being conducted in your area. Thus, you can discover how others evaluate, shape, and focus their topics in ways that encourage further fruitful research. It is that level of command to which you should aspire.

It is important to note that, whilst informal sources such as blogs, lectures, social network discussions, textbooks, and encyclopaedia articles are important ways of finding out about the research literature, it is rare for these to be cited in your thesis. Instead, you should use them to find out about the main peer-reviewed research literature in your field. In most areas of study, this literature will primarily consist of articles in academic journals. In some areas, for example in history or literary studies, books (research monographs) will be important sources for the research literature, whereas in many scientific areas, very little original research is presented in books. In some areas, such as engineering disciplines, conference papers are carefully reviewed and published in formal conference proceedings, which are regarded as important pieces of the research literature. In other subjects, conferences consist of the informal exploration of early-stage ideas that are then subsequently published in journal articles or books.

The above advice applies across all fields of study. However, in some areas, demonstrating an understanding of research may also involve a review of things other than the research literature. For example, in a subject such as computer science, a 'technology review' might sit alongside the literature review as part of demonstrating your understanding of the research field; in an artistic subject, an overview of relevant pieces of music, works of art or theatrical performances might be appropriate.

It may be useful for you to read an article, or attend a workshop, specifically about writing a literature review in your subject. Some examples of good practice can also be found in books such as Bell and Waters (2018) and Murray (2017).

Research topic

The second element in the form of the PhD is the research topic. It is here that you spell out in great detail precisely what you are researching and why. You establish the nature of your problem and set about analysing it through the generation of hypotheses, and if appropriate, the examination of others' arguments.

In order to discuss the research topic effectively, it is vital to have a thesis in the narrow sense. This gives a clear 'story line' and enables you to

interrelate what you are doing during the course of your research in an organized way, and thus develop your theoretical arguments. Your thesis and the need to support it with your data and arguments perform important work for you as the criteria for what is relevant to include in your study. You should therefore be very careful to ensure that the argument is not blurred with extraneous or makeweight material that is not contributing to the maintenance of your thesis position. It can sometimes be very difficult, psychologically, to leave out material into which you have put a lot of work. Nonetheless, you must prioritize the key goal of writing a clear, clean, and comprehensible thesis, where your research topic is always in focus.

Research methodology

The third element of the PhD form is the research methodology. In the most general terms, this gives the justification for the relevance and validity of the material that you are going to use to support your thesis. A key question the examiners will ask in evaluating your work must be: why should we (your fellow academics in the field) have to listen to you? You must clearly have a convincing answer.

Just what the content of your research methodology is will vary enormously from discipline to discipline. It is important to explain why your chosen methodology is appropriate to your research questions or hypotheses, and why it will give insight into the topic of your PhD. In the sciences, it will entail the establishment of a supportable theory and justification of a particular experimental approach, as well as a demonstration that your apparatus is sensitive enough to detect the effect and is reliably calibrated. In historical studies, you will need to show that, in the light of your topic and your analytical approach to it, your documents are adequate and properly interpreted. In the social sciences, in addition to justifying your methods of data collection, you might need to engage in an epistemological discussion about which interpretative framework (e.g. positivist, postmodernist) it is appropriate for you to use.

Identifying just what an adequate discussion of the research methodology for your particular thesis involves, is one of the professional tasks that you have to undertake. You do this in discussion with your supervisors, by reviewing the latest papers in your field, and by reading successful PhD theses.

Research contribution

The core of your thesis will be a number of chapters where you explain the research that you carried out. This is where you bring together the research field, topic, and methodology. It is in these sections where you attempt to

answer your questions and test your hypotheses. To do this, you apply the methods that you described in your methodology section. You then present the findings from those investigations. Just because you are now writing about your own research, you should not stop making references and contextualizing your work. Exactly how you carry out and present these investigations will depend on your discipline. Your supervisors will be able to advise you on the structure.

Furthermore, you will need to take advice from your supervisors about what constitutes a substantial enough contribution to be worthy of a PhD. You should be developing this sense throughout your work, but you will need guidance to understand what constitutes originality in your field.

This section is also where you demonstrate the originality of your work. You should show that you are not only able to ask new and interesting questions, but are also able to apply the methods to a new area, and come up with rigorously presented conclusions. Remember that there are many ways of being original, as we discussed in Chapter 5. It might help you to refer to this section and use the ideas there in explaining why your work is original. It should be clear from the structure of your thesis where your analysis of the existing literature ends and where your original contribution begins. If you do not make this clear, then examiners can struggle to understand what the contribution of your work is.

Research evaluation

The evaluation of your research is the final element in the PhD form. It is concerned with your evaluation of the importance of your thesis to the development of the discipline. It is here that you underline the significance of your analysis, point out the limitations in your material, suggest what new work is now appropriate, and so on. In the most general terms, it is a discussion as to why and in what way the theories in the research field and on the research topic that you started with are now different as a result of your research work. Thus, your successors (who include, of course, yourself) now face a different situation when determining what their research work should be since they now have to take account of your work.

It might seem strange that you are asked to evaluate your own work, pointing out its limitations, putting it into perspective, and so on. After all, aren't you likely to think your study is the best thing since sliced bread, or at least take a very biased view of it? Well, clearly not, and this is another demonstration of the point that we made in Chapter 3 on the meaning of a doctorate. From the point of view of the PhD process, you are not doing the research for its own sake, although that might be your personal motivation. You are doing it because it gives you the opportunity to demonstrate that you are a fully professional researcher, with a good grasp of what is happening in your field and capable of evaluating

the impact of new contributions to it – both your own as well as others'. That is what you get the doctorate for.

In practical terms, this component of the thesis is usually the last chapter, and it is very important not to underestimate this task. We have already pointed out in Chapter 4 that it takes much longer to write than you anticipate. Indeed, in our experience the inadequacy of this component is the most common single reason for requiring students to resubmit their theses after first presentation.

There is one particular trap to avoid. If you entitle your last chapter 'Summary and Conclusions', then it should contain both. It is very easy for this chapter to consist of an over-long summary, and very little in the way of conclusions. A concise summary is useful, but remember that the examiners will have read the work in the last few days, and so it will be fresh in their minds. Therefore, an extensive summary is not needed. Instead, the chapter should focus on the conclusions of your work. What are the key findings from your research? How does it contribute in an original way to your discipline? What new directions and opportunities for future work does it lead on to? How, as a result of your contribution, are the theories in your research field and on your research topic now different in an identifiable way? Occasionally, examiners find, after an overlong summary, that it is only on the final page (or maybe only the final paragraph) when a conclusion is attempted. This is not adequate. As we have noted, there are several aspects to a thesis conclusion, and all of these should be covered.

Detailed structure and choice of chapter headings

You may hear people telling you about the 'ideal' length of a thesis. Pay no attention. A thesis should be no longer than it needs to be in order to report what you have done, why you did it, and what you have concluded from the results of your work. The university regulations on the length of the thesis generally specify a maximum. If you can establish your thesis argument in less than that length, it is all to the good.

You might adopt the maxim that if you can say it briefly, you should do so; but not if this means using lots of long words and complex sentence structures.

As we saw above, a thesis must contain the five elements of the PhD form. Just how they are presented can vary. A commonly used possible example, for an empirically based thesis, would be:

- introduction (including aims);
- literature survey (a review of the relevant literature in the research field and on the research topic);
- research topic and how it is tackled;

- research methodology (data collection including a description of what has been done);
- results (what was found);
- discussion (development of research topic and suggestions for future work);
- conclusions (short summary and detailed contribution).

These general sections can be further subdivided into relevant chapters, depending on your discipline and topic. Those working in traditions other than empirical data collection will have different ways of covering the five elements of the PhD form.

In addition to the main sections, your thesis will require, at the beginning, an abstract that summarizes the work in order to make the job of the examiners easier. There should also be a clear statement of the problem under exploration, and a clear statement of your original contribution.

Once they know what to expect, the examiners have a frame of reference for reading the thesis. At the end of your thesis, you should provide a detailed list of references and any appendices such as graphs, tables, data collection sheets, etc., that do not fit easily into the main body of the text.

Your university will have detailed information on how the finished article should look, including precise width of margins and wording of the title page. There will also be rules concerning the binding of the thesis and number of copies to be produced, and instructions about how to upload a copy of the thesis to the library website. Be sure that you are in possession of all this information so that you do not have a last-minute panic because you failed to adhere to some minor but crucial instruction.

Once you have all these formalities under your control, you can begin to have fun with the thesis. Thinking of pertinent but snappy titles for your chapters and subsections is a pleasant diversion from churning out thousands of words to conform to the expectations of supervisors and examiners. Even the title of the thesis itself can be a source of entertainment for a while. Don't go for the dry-as-dust and long-winded descriptive title. Yes, of course the title must bear a relationship to the contents, but that's no reason for it to make what is inside the thesis sound boring. Try to whet the appetite of the reader, arouse the curiosity of the examiner.

One supervisor repeatedly told his students that he expected to be supplied with a thesis that would make bedtime reading, challenging his usual book. He expected to be so engrossed in it that he would be unable to put it down and would read it right through until 2am or later in order not to spoil the flow. This might sound like an impossible task, but that is no reason not to aim for it. What it means is that you have to use everyday English instead of jargon wherever possible, without losing the precision of definition that is essential. You should also keep to sentences that do not include complicated constructions, such as ever-increasing numbers of embedded clauses.

Aim to impress with clarity as well as original and sound research. Remember that even well-established experts are human beings, and nobody enjoys turgid prose.

When to write

You should be undertaking regular academic writing right from the start of your PhD studies. However, fitting writing in to all the other activities you have to undertake does present a problem.

The patron saint of PhD writing is the Victorian novelist, Anthony Trollope. He wrote many novels, including the famous *Barchester* and *Palliser* series. How did he achieve this output? He was diligent about putting aside three hours every day, at the same time, and he repeated that the next day, and the next, and carried on and on. As he explained in his autobiography:

> When I have commenced a new book, I have always prepared a diary, divided into weeks, and carried it on for the period which I have allowed myself for the completion of the work. In this I have entered, day by day, the number of pages I have written, so that if at any time I have slipped into idleness for a day or two, the record of that idleness has been there, staring me in the face, and demanding of me increased labour, so that the deficiency might be supplied. … There has ever been the record before me, and a week passed with an insufficient number of pages has been a blister to my eye, and a month so disgraced would have been a sorrow to my heart. (Trollope, 1883)

Trollope aimed to write 2,000 words in three hours, which is rather more than most of us can expect to achieve in that amount of time. But it is not the number of words, but the regularity with which he wrote that stands as an exemplar to us all. Trollope's 'secret', if you can call it that, was that he regularly allocated time to writing and nothing else, and allowed nothing to interfere with this. He did not fit his writing around his other tasks, but fitted them around his writing.

One popular idea on time management in writing is the 'pomodoro technique', created by Francesco Cirillo (pomodorotechnique.com), whereby bouts of writing are interspersed with short breaks. Basically, you write for a period of, say, 25 minutes before taking a five-minute break. After four bouts of such writing, you take a longer break – say, 15 minutes. Then, you start over.

There appears to be no systematic research on the technique, but many people say that the system helps them to think more clearly and stay focused; others find it of no use whatsoever. Originally, a kitchen timer in

the shape of a tomato (Italian *pomodoro*) was used, but most people now use an app on their phone or computer.

Our final advice on timing is not intuitively obvious, and thus all the more important. When you come to the end of your allocated time and have to stop writing, do NOT carry on until you reach a natural break – the end of a section, chapter, etc. You should deliberately leave your work in the middle – mid-design, mid-chapter, mid-paragraph, even mid-sentence. Your psychological need to complete the task provides you with extra internal pressure to return and finish what you have started. It also makes re-starting easier and quicker.

How to write

Getting started on writing

EMP found that research students in science disciplines showed a preference for experimental work, including keeping lab books up to date. Writing papers or thesis chapters was assigned to evenings, weekends and holidays. For example, students said:

> If it's time-consuming and mindless, like just repeating experiments, I like it, but if it's difficult too, like writing an introduction and conclusion, then I don't like it.

> I'd rather potter about in the laboratory during working hours – it's less taxing mentally.

Writing was not perceived as 'real work', and as it was thought to be of only secondary importance, was never undertaken at the time intended. One student said, 'I'm doing bits and pieces of writing-up whenever I get a minute' but repeatedly abandoned the latest piece of writing.

Procrastination and incoherence are often the order of the day. In the end, it is your responsibility to make a start on writing, since no-one else can do it for you. Your supervisor will be able to comment on your writing, but only once that writing has begun! The discipline needed to produce it in the first place is down to you. In fact, most research students tend to postpone writing until their final year, but we advise very strongly indeed against adopting this course of action.

So do you have a problem getting started writing? Are you always waiting for inspiration to strike? Would you rather be doing other things, like re-examining your data? Are there emails and tweets to check, a tutorial to be prepared, shopping to be done – maybe your room needs a tidy? Well, it's the same for all budding authors. The ones that write, like Trollope, fix a

time for writing and stick to it. When that time arrives they take a deep breath, grit their teeth, and write. You can do that too.

Try the following exercise. Anthony Trollope paced himself to write 250 words every quarter of an hour. He had to make do with ruled sheets of paper, each of which he calculated took 250 words in his handwriting – we have PCs and word counters to help us. As a beginner, cut yourself a little slack. Write 200 words in 20 minutes beginning 'The aim of my research is …'. Don't start now, instead set yourself a time each day to do it. It does not have to be in the early morning; pick a time that suits your circumstances and pattern of working. But stick to that time, and ensure that you will not be interrupted.

How did it go? Did you manage to establish and maintain a time slot devoted to writing and nothing else? If so, you have taken the first step on Trollope's road. Did you discover, as most do, that inspiration comes *after* you have started writing? When you have finished, show the draft to a couple of colleagues and get their reactions. Is your writing clear? How well have they understood what you are trying to say? Make improvements as necessary and show the revised piece to your supervisors.

Some people find that social pressures help with the solitary process of writing. At a number of universities, there are 'shut up and write' groups (https://shutupwrite.com). Each meeting starts with attendees giving a brief account of what they are going to write about; this public commitment helps facilitate their writing. They then spend the rest of the session in the room together, in silence, working on their individual pieces of writing. At the end of the session, they spend a few minutes discussing what they have achieved during the session. Of course, they *could* just do this writing in their own room or in the library; but they find that the social pressures of being in a particular place, at a particular time, with other people doing the same activity, adds to their motivation to work in a focused way on writing.

Writing as a process of rewriting

Your thesis is the product on which you will be assessed. Writing it is far more than merely reporting the outcome of several years of research. Students experience a great deal of discomfort when attempting to present results in written form because writing makes people think about their work in a different way. If writing leads to discovery and not, as is generally supposed, discoveries that merely need to be written down, then it is easy to understand why writing the thesis is experienced as the most difficult part of the work.

One student said, 'Obviously you don't formulate what you're going to say *completely* until you come to write it down … it was only when I was writing it that I realized that in one section my interpretation was completely

wrong. The point I was trying to make just wouldn't embody itself verbally, so I thought it out again and rewrote the whole section'.

If you are able to read what you have written as though it were the work of someone else, you will find it easier to be critical of your own imprecise phrases and sloppy style. The way to achieve this 'distance' between yourself and your work is to put it aside for a few days and then come back to it as though you had never seen it before. Alternatively, if there is no time for that, you might try doing something else – catch up on phone calls and messages, check social media, meet up with friends –and then come back to it. The psychological switch will help to create the required distance. Another technique is to read aloud what you have written, as hearing often reveals the difference between what you intended to say and what you actually did say. Rania, a computer science student, used to read drafts of her thesis to her cat – it is not clear whether the cat provided any useful academic feedback, but it helped overcome the embarrassment of reading out loud in an otherwise empty room. Alternatively, recording what you have written and playing it back so that you can hear it is also a good idea.

Rugg and Petre (2020) give a helpful overview of writing for a PhD thesis, including a list of the 14 or more activities involved. Rewriting is a very important aspect of the writing process and it is a good idea to keep successive drafts of a report or a chapter, then compare them to see whether later drafts define and refine meaning more effectively than earlier ones. The final version can be used in the thesis and can also serve as the basis for journal articles you submit for publication.

Different types of writers

Not everybody goes about writing in the same way. Just as there are at least two different kinds of learners, there are also two distinct types of writer. At school, we are instructed to make a plan and then write the essay. But we are not all 'planners' – some of us are 'get it all out'-ers. It is not at all easy both to say what you want to say *and* say it in the best possible way at the same time. It is sensible, therefore, to do it in stages.

Serialists see writing as a sequential process in which the words are corrected as they are written; they also plan their writing in detail before beginning to write. Here is an example of the serialist approach:

> It's stylistic, the phrasing of the work and the way it flows, that I'm having difficulty with at the moment. When I do write sentences I feel good about my style. I don't feel like an inadequate writer, but writing sentences is very slow.

One way in which such serialists work is to create a document consisting of a large number of bullet points and half-formed ideas, which are then

gradually fleshed out into full sentences. If you work in this way, then it is useful to use different fonts or colours to emphasize which parts of the document have reached the fully-written stage and which are still to be worked on.

By contrast, *holists* can only think as they write and compose a succession of complete drafts.

> I write a complete first draft in longhand. As I go along I tend to revise a bit, but when I've finished I revise a great deal and it tends to look like World War 3 on paper. If I'm really interested in it I'll start at 8.30am or 9.30am and go on until late at night. Once I start I want to see it finished, the shorter the time between conception and completion the better.

The serialist emphasizes the writing of sentences, which is very different from the way the holistic writer talks.

The practicalities of writing

Some students like to work directly onto the computer; some take notes, or even write substantial drafts, by hand first. There is no best way; you will need to experiment to find which way works best for you.

Theses in many disciplines will be written using mainstream word processors such as Microsoft Word. However, in some scientific disciplines, the LaTeX system is standard, as it allows the creation of complex documents involving lots of mathematical notation. If this is the standard in your discipline, then attending a short course to learn the basics is useful, and most universities will offer such courses.

We are all accustomed to computer spellcheckers, but there are also grammar checkers, which are of variable quality. In particular, grammar checkers are not particularly well set up to handle aspects of academic writing (e.g. they will often suggest that you rewrite sentences in the passive voice, which is not good advice in many styles of academic and scientific writing). Nonetheless, they can provide some basic feedback, particularly for students who are not native or fluent writers of English.

Some reference books (or online equivalents) are useful too. Dictionaries are useful for understanding the subtle differences between words, and for finding examples of words used in context; many universities will have subscriptions to online versions of major dictionaries such as the *Oxford English Dictionary*. Other books (such as Gowers' *Plain Words* and Fowler's *Modern English Usage*) give guidance on the trickier and more subtle parts of the language, whilst *Roget's Thesaurus* groups words of similar meaning, allowing you to find just the right word for a particular situation.

There are also bibliographical management tools such as RefWorks and BibTeX. These allow you to create a database of papers, books, etc., and then automatically generate a bibliography in any desired style, and create

links to that bibliography from the main text. For writing a document of the length and complexity of a PhD thesis, using a system such as this will save you a vast amount of effort.

The writing process cycle

The 'writing process cycle' is a systematic way of approaching the writing task. It consists of several steps:

- generate the main points (in any order if you're a holist, and sequentially if you're a serialist, or perhaps as a mind map where you spread the points out on a page and connect together linked points with lines), noting everything that comes into your mind, thus making a rough plan (which you need not stick to);
- organize this into an acceptable structure, and only then attempt to construct the points into grammatical paragraphs made up of well-balanced sentences;
- set goals and targets for yourself in terms of writing and dates to achieve them by;
- plan to spend 2–5 hours a week on writing, specify those hours at the beginning of the week and stick to them, Trollope-wise, making sure there are no interruptions;
- find quiet conditions in which to write and, if possible, always write in the same place;
- reread and edit what you have written;
- get feedback by asking colleagues and friends to comment on early drafts before you show them to your supervisors;
- revise on the basis of the feedback from colleagues;
- get more feedback from your supervisors;
- accept feedback and revise or rethink.

Thus feedback is an important component of the writing process. Since you will be asking your colleagues for such feedback on your work, you will inevitably need to reciprocate by giving them feedback too. So, it is important to be aware of how to give feedback effectively. We discuss the principles of giving such feedback in Chapter 11 (pp. 211–14) for supervisors, but they are highly relevant to you as well.

Learning to write

How do you learn to write, and to improve your writing? By the time you are writing your PhD, you will be a competent user of the English language.

This does not mean, however, that you have the writing skills necessary to write in the academic English that you will need for your PhD thesis. How do you learn to write in this style, and how do you improve as a writer of academic English? One thing is sure, you will not be taught how to write.

The foundation for good writing in any style is reading. As you read, pay attention not just to the content of the writing, but to the way in which the paper or book is written. Note the vocabulary used and how sentences are structured. How do these differ from how you might express your thoughts in day-to-day writing? How is the writing structured? Remember that good writing needs attention at several levels, from the arrangement of sections and paragraphs to make a clear argument, through the structure of individual sentences, to the choice of specific words. Mewburn, Firth and Lehmann (2018) provide detailed advice about how to structure your academic writing, which we think you might find helpful.

Many universities offer courses on improving your writing. Again, these can be useful, but ensure that the advice is relevant to your specific discipline. More useful is individual feedback.

Some writing courses encourage a 'workshop' style, where you write a fragment, exchange it with other people in the group, and then share your thoughts and comments. Simply asking someone, whether an expert such as your supervisor, or a lay person such as a housemate or family member, to explain back to you what you have written can often be revelatory.

Someone reading your writing can believe that they have understood what you have written. But, when they explain it back to you, you realize that their understanding is (completely?) at odds with what you had intended to convey.

Academic writing does not mean it has to be obscure and jargon-filled. Good academic writing should aim to be clear. This will often mean using terminology from the discipline for precision and concision, but it can equally mean clearly describing your ideas and work using straightforward everyday language. Advice that you may have received at school or in creative writing classes might not be useful for clear academic writing. For example, in creative writing courses you are encouraged to vary your vocabulary, and use different ways of describing the same thing; in academic writing, where precision and clarity are key aims, doing this would be disastrous.

Taking inspiration from what you read does not mean copying the exact words used. Some students start their writing, particularly in the literature review section, by copying many quotations from papers they have read. They then try to adapt those quotations and link them together. Don't do this. It can lead to messy writing, which won't convey with clarity your own understanding of the subject. At worst, this can border on plagiarism, where it appears that you are passing-off barely changed sentences as your own original work. Instead, structure the ideas in your own way, in particular in

a way that provides appropriate background and support for the ideas in the thesis.

Advice from your supervisor on writing is invaluable, but don't expect your supervisor to give you detailed advice on the finer points of your writing. Supervisors might make detailed comments on a couple of pages, to help you learn appropriate writing style, but do not expect them to do this for the whole thesis. Other supervisors, despite their subject expertise, might not consider themselves to be experts on teaching writing skills.

It is valuable to have an explicit conversation with your supervisors about the support they can offer with writing. This prevents you starting out with different expectations. You may find that mutual support from fellow students, such as in the form of a 'buddy' system (see p. 142), where you agree with a fellow student or small group of students to read one another's work, may be just as productive as advice from a supervisor.

Writer's block

Writer's block is a term used in a wide variety of situations. It has been experienced by eminent novelists such as Ray Bradbury and Hilary Mantel, who have described their temporary inability to find the words to create stories and characters as they are used to doing. The term also applies to PhD students and other academics who find writing about their research a difficult struggle and who may, on occasion, find that it is such a trial that they give up. Although using the same term, academics clearly face different writing tasks from novelists. Creative writers have to imagine situations and follow their creations wherever they may lead. Researchers have to describe and interpret what they have achieved, which is inevitably finite and limited.

Common causes of academic writer's block include:

- the writer is not skilled and practised enough in writing;
- the writer wonders if, having done the research and seen the results, it is worth the bother anyway;
- the writer feels that they must be sure what they want to write before they start writing;
- the writer imagines some vast and apparently unending body of writing which needs to be achieved to express what they need to say about their research, and they don't know where to start.

As we have already noted, the writing task that PhD researchers face is not the same as that faced by novelists. Nevertheless, academic writers should note something the novelist Mark Twain had to say when he wrote: 'The secret of getting ahead is getting started. The secret of getting started

is breaking your complex overwhelming tasks into small manageable tasks, and then starting on the first one'.

So the message is: start small but start real. If you are blocked, don't try to write the whole thesis. Pick a small part of your work that you know very well (for example, your apparatus, your questionnaire, your sample, your historical period, your reason for choosing this topic, the limitations of previous research) and write about that. Remember that, compared with the novelist, you don't have to create a new world. Just pick something about which you know a great deal, and write.

In the hopefully unlikely event that you have arrived at the writing up stage without having much, or any, experience at writing continuous prose, then go back to the beginning of this chapter and follow the suggestions there for getting writing experience.

The feeling 'Is it all worthwhile, anyway?' is one that besets every writer of every sort. The novelist Franz Kafka left instructions on his death that all his work should be destroyed because it was not good enough. Fortunately, his orders were not obeyed and, based on this work, he is now regarded as one of the most important novelists of the twentieth century. Similarly, some PhD students think that once their results are out there for all to see, they don't add up to much. But remember that Kafka, despite his feelings, carried on writing, presumably hoping that his work would improve. You have to carry on writing too, following the 'writing process cycle' described above on page 118, confident in the knowledge that the more you write the better you will become. The process of writing itself greatly helps you to generate new ideas, sort out the logical order of your presentation, formulate your end point, and so on.

Not getting started can be overcome. As Mark Twain said, start by breaking your overall task up into manageable sections. For example, you could list possible chapter headings for your thesis, then allocate topics to each chapter, then list possible points under each topic. Having done this, it is likely one of the sections seems more straightforward than the others. You can then start writing that.

The following is some good advice about where to start writing, or what to write next: choose what is easiest for you at this moment. You don't have to feel guilty about choosing the easy way. No writing is that easy, but some parts are easier for you at the present time.

The content and style of the thesis

The content of the thesis

The general form of a PhD thesis was covered above. There, you will find the various aspects of your research work that must be included. In the thesis, it is necessary to formulate clearly in writing ideas that you will have got to know very well indeed but which will be new to the reader. This means

that assumptions have to be made explicit and ideas expressed clearly. The thinking that links one idea with others or that emerges from a particular hypothesis has to be unambiguously translated into the written language. Remarks such as 'good writing can't cure bad thoughts' and 'I can't clearly express in words what I have in my head' are typical of the comments made by thesis-writers. Eminent poets, authors, and psychologists admit that the only time they think is when they write. This may be true of all writing.

EMP found that students and supervisors agree that a thesis should compress a great deal of information into a highly structured, yet relatively short, format. Supervisors see this positively, as confirmation that the student has finally managed to understand what is required in order to summarize and conceptualize their work. One supervisor said: 'Evolution of the thesis is not so much a change in length but a change from what was traditionally a large book to something that should become two or three or four separate projects tied together with a theme, all different aspects of a specific topic'. Another, speaking as an experienced examiner, talked of 'making the string of sausages into a small salami'!

Students, on the other hand, see it as a negative requirement that impoverishes the richness of the information they have worked so hard to acquire. They complain that lots of different areas have to be forced into one section and perceive the thesis format to be constraining. Students know what is required of them. As one put it, 'To be good, work needs to be relevant to some problem and valid in its methodology. It should also be clear in its expression'.

The style of the thesis

In Chapter 3 (pp. 28/29), we suggest that you regularly read academic journals. The relevant journals will give you examples of the currently acceptable style of academic writing in your field. You should, from the beginning, practise using this style and attempt to gain some proficiency in it.

Two important details are the referencing and footnoting conventions. For example, are footnotes encouraged, allowed or forbidden? What style of references should be used? It is important that you follow the regulations of thesis presentation from your university. Make sure that all the references in the text are listed in the bibliography. Then recheck to find the inevitable few that you missed! These pedantic details do not sound important, but you should note that an easy way to irritate your examiners, and therefore start off on the wrong foot, is to get them wrong. So, you must be punctilious about your references.

Alternative thesis styles

Times are changing and in some social sciences and humanities there is now a gradual acceptance of alternative styles of presentation. Instead of

having to express your thinking and work in what we might recognize as 'academic' style, it is acceptable to use the kind of language you might employ when writing a letter. So long as what you are saying is clear and unambiguous, there should be no problem. This may apply in other subjects too but you will need to find out what is permitted in your discipline.

Murray (2017) distinguishes between formal and informal writing, where the informal or simple, everyday style is used for free writing and notes for yourself. The formal, or more academic, is used for drafts of sections of the thesis. Murray's examples demonstrate her belief that academic writing for a thesis needs to be in the past tense, passive voice, and with an objective viewpoint. The writer is firmly removed from the whole venture. We do not consider this to be necessary for all topics in all subjects. The ways of describing your work and thoughts in writing are often subject-specific with disciplines having their own conventions. Reading accepted journal articles and theses in your field will make these clear but do bear in mind that changes are occurring.

Murray discusses how understanding what you have written for yourself helps you to express your ideas in more specialized language and stresses the importance of defining terms carefully and defending what you have written with good supporting arguments. While we agree emphatically with this, we do not believe that it is only possible using technical terminology. For example, think how you would explain a significant point in your work to your family, as opposed to your colleagues, and then check whether you have actually said the same thing in both cases. If so, you have mastered, in part, the highly skilled task of being able to communicate equally well with lay persons and professionals in your field – as Einstein advocated.

Hartley (2004) used a standard method to measure the ease of readability of texts, called the Flesch Reading Ease score (FRE), to show that articles which had proved to be more influential over a period of years were written in a more accessible, easy-to-read and understand style than less influential articles. He found that this was true of classic texts such as Einstein's first paper on relativity and Watson and Crick's (1953) paper on the structure of DNA. More recently, Hartley (2015) has proposed that journals automatically reject any submission with a low FRE score. Of course, if a particular term is used in a specific way in a specialist context, the technical word is essential, but it is not necessary to make thesis writing overcomplicated and difficult to penetrate.

How do you improve the readability of your work? Measures such as the FRE favour texts that have shorter words and less wordy sentences. Oxenham and Sutton (2015) have said that you should '… take time over your writing: it matters. Don't drain it of colour. Put yourself and others back into the worlds you write about. Above all consider your audience and try to write in smaller words for bigger circles'.

You might use computer-based tools to assess the readability of your work and suggest improvements. Several websites allow you to input samples of text and compute a readability score (e.g. https://www.webfx.com/tools/read-able/flesch-kincaid.html).

There are also a number of grammar-checker tools, freely available (e.g. http://www.hemingwayapp.com) or for sale (e.g. https://www.grammarly.com) that analyse your text and suggest changes. For example, the Hemingway app examines your text for excessive use of adverbs and the passive voice, suggests which sentences are hard to read, and gives ideas for rephrasing complex sentences.

Disciplines also vary in how much your personal voice can be heard or the extent to which your thesis can support the 'writing in' of the researcher. This becomes important when there are issues of impartiality, involving making decisions about how you present ideas with which you disagree. If you wish to include your own subjective point of view, it is vital that you make clear both that it is indeed your own interpretation and that you are completely aware of the objective way of describing the theory, idea or 'fact'. One way of doing this would be to use different fonts for different voices.

We applaud this notion of making your thesis 'reader-friendly' for your professional peers. Look at the latest edition of any journal in your field, and notice how, though all follow current conventions, some are much more readable than others. Those are the ones you should emulate.

Writing conference papers and journal articles

As part of your development into a fully professional researcher, there are two other important pieces of writing that you should be thinking about as a PhD student: conference papers and journal articles. These are the ways in which you begin to test whether you have something to say that your professional colleagues want to listen to. At some point in the later stages of your research, you should consider whether you can get a conference paper delivered and a journal article accepted. These papers are much shorter than your thesis, and typically will cover only an aspect or a component of your research.

Conference papers are often easier to get accepted and we suggest that you start there. Indeed, in many larger doctoral programmes, the department will arrange an internal conference that will give you a gentle start on presentation. As with the need to read accepted PhDs to get some insight into the standards required, so you need to obtain copies of papers presented to the public conferences of your discipline to which you might submit. Your supervisors and the academic bodies that organize the conferences should be able to help. In many disciplines there are reserved tracks where

doctoral students present, and obviously it is sensible to start your public presentations in this more protected environment if that is possible. You need to read several student papers to get an understanding of what is expected of research students in your discipline. Hopefully, reading the beginning efforts of other students in your field will encourage you to feel that you, too, can present a worthy contribution. In many cases, universities will be able to cover the costs of attending conferences at which you have had a paper accepted, and you should not hesitate to ask whether such financial support is available.

A larger step is to develop a paper for publication in an academic journal. It is a much bigger task, since it is a major step in your academic development, making your work accessible to many members of your professional group. A published paper may also be presented as supporting material in your thesis submission (see p. 185).

If you work in a science environment with your research being part of a wider programme in which one of your supervisors is the principal investigator, then your first paper is likely to be a joint one, co-authored with your supervisor. This clearly has advantages in that you will be working with an experienced published researcher to learn the 'tricks of the trade'.

If you are working in a more individual research environment, then your first task is to determine which journal you are going to submit to. This needs more thought than is often given by beginners. All disciplines have a large number of journals among which to choose. Your contribution must fit into the journal's policy and practice if it is to be seriously considered. If you are presenting empirical results, then it is no use submitting to a journal that concentrates on reviews and 'think-pieces'. If your paper is a specific technical one on a particular topic, then it must be submitted to a journal that publishes on that topic, not one that concentrates on other issues. All academic editors will tell you of the considerable number of articles received that, whatever their standard, are inappropriate for their journal.

You must find, with the help of your supervisors, a journal that, at least in principle, can accept a submission based on your research. You can then search for a recently published paper that you consider an outstanding contribution – it would be sensible to check that your supervisors agree with you! You are then ready to analyse what makes it so good: the logical layout of the argument, the reliability and validity of the data collected, the form and rigour of the analysis, the originality of the findings or the clarity of the conclusions. This can then act as a guide, as you determine how you can bring your study up to these standards.

In preparing your paper for publication, you go through the writing process as described earlier in this chapter – developing drafts, getting feedback from colleagues and then from supervisors – until you are ready to submit the paper. All established academics spend time regularly reviewing articles for inclusion in journals. If your paper is accepted to go through

the journal's review process, you will receive a significant amount of highly relevant feedback from leading academics working in your field. This will, of course, help not only in improving your paper but also your PhD thesis.

Although presenting conference papers and writing journal articles constitute an important part of a PhD student's professional development, as always, there are dangers of which you need to be aware and beware.

First, there are no rules, at the present time, that journal publications are required for a PhD degree. It is true that university regulations say that the examiners have to determine that the thesis is 'worthy of publication'. But by 'publication' here is meant that the thesis is deemed worthy of being placed in the University Library with the designation as an accepted PhD of the University of X.

Second, a strong concern is that it can be used to divert time that would otherwise be spent on writing the thesis. Because the thesis is a daunting document, some research students experience panic symptoms at the mere thought of trying to write it. These panic symptoms vie with feelings of guilt when the student is not writing. One way of stemming both these emotions is to write – but not to write the thesis. Therefore, the legitimate activity of writing a paper for publication is used to evade the inevitable duty of confronting the actual thesis writing.

If the paper writing is approached professionally; if not too much time is spent on it; if it is sent off for refereeing and then attention is returned to thesis writing, it would be time well spent. But, if the paper writing continues indefinitely; if it is never quite good enough to be sent to a journal; if it always requires just a little more work, time, and attention, then it only succeeds in distancing you even further from your thesis and the work that needs to be done. For these reasons, any writing aimed at publication must be agreed with your supervisors and closely monitored throughout the process.

Ultimately, however, whether you write any papers for publication during your time as a PhD student is really up to you. If you consider the PhD to be a period of professional training, then learning to write papers, as well as learning to teach and do research, is an important component. Provided you know what you want to get out of it, and what you want to do at the end, you can choose your own specific objectives. The criteria for obtaining a PhD are the same for everybody (presenting and defending an original piece of work). If you meet those criteria, you are free to develop the skills you need.

As a complement to this more formal writing about your research, you might also consider writing for a wider audience. This could take the form of a blog where you post regular short updates, or an article for a website such as The Conversation (https://theconversation.com/), where researchers write about their work in a style similar to a newspaper or magazine article. These more informal styles of writing can be useful to you in shaping

your thoughts, because you cannot hide behind detail and jargon. Instead, you have to get to the heart of your ideas using everyday language. Not only does this communicate to a wider audience, but it can help you to distil what is really important about your research. You shouldn't, however, take part in this kind of activity to excess. If you are not careful, it can end up being a displacement activity from the core tasks of conducting research and writing your thesis.

Open access

In the last few years, there has been an active debate in universities about whether academic publications should be made available via open access; that is, whether papers and theses should be put online for anyone to download. In some subject areas, the use of so-called preprint servers, where authors put preliminary versions of their papers online, is standard. In other areas, this is hardly known. You will need to familiarize yourself with the norms in your discipline.

Of particular importance to you as a PhD student is whether to make your final, approved thesis available online. Many university libraries offer the option of making an online copy of your thesis available for download after it has been approved by the examiners. Alternatively, you could put this on a website of your own. There are many advantages to doing this, most obviously that people around the world will be readily able to read and build upon your research. However, there may be reasons not to do this, or at least to delay it for a couple of years (this is called *embargoing* your thesis). For example, you may feel that a publisher will be less interested in publishing a book based on your thesis work if the thesis is already available online. You may have plans for writing post-thesis papers, and be worried that other researchers will have used your findings before you have had the opportunity to publish.

Occasionally, commercial agreements for industry-sponsored PhDs may prevent the release of the thesis for a number of years after examination. In the end, you will need to discuss the options for open access with your supervisors, and indeed many universities are putting this issue systematically on the agenda of the final progress meeting before submission.

Traditionally, journal papers were only available if your university library subscribed to that journal, or if you paid for a copy. Many papers are now freely available on the web. Some journals allow green open access, where authors can put copies of their papers on the web. Usually, this comes with conditions, such as making a link to the journal website or delaying putting the paper online by a year.

You should find out how this is done at your university. Other journals use gold open access, where they charge universities to make papers openly

available. You should investigate whether there is a fund in your university, centrally, or in your department, that will pay for your papers to be made open access. A comprehensive database of journal open access policies can be found at the Sherpa Romeo site (https://v2.sherpa.ac.uk/romeo/).

Beyond open access to theses and papers, there is a wider trend towards open science and open research. The aim of this is to:

- make a wider range of material generated in the course of research publicly available;
- enable other researchers to re-analyse research in new ways;
- allow other researchers to build on that research.

For example, a science researcher might make the computer code used for their research available. A social science researcher might put a dataset on the web, appropriately anonymized. A researcher in the humanities could make a collection of annotated primary sources available for other researchers to analyse. In some areas of study, journals will not accept papers that do not also include open data. For example, the *Journal of Structural Biology* makes it clear in its instructions to authors that 'for papers describing high-resolution structures of biological macromolecules, the coordinates and the related experimental data … must be deposited at a member site of the Worldwide Protein Data Bank'.

There is much value in making your materials available, and this can be a good way to make a wider impact in your community. However, it is not always straightforward. In order for a dataset or piece of code to be usable by other researchers, it is likely that you will have to annotate it more precisely than just for your own work. In addition, you must spell out carefully the assumptions behind it and give instructions for how it can be used.

Increasingly, government-funded agencies are requiring their research to be made available through open access. Many such agencies around the world have subscribed to *Plan S* (https://www.coalition-s.org/why-plan-s/), a long-term project whose mission is that 'no science should be locked behind paywalls'. If your PhD is funded from a research grant or is part of a larger doctoral training centre, your supervisors should make you aware of any requirements that this places on your publications.

Spamferences, fake journals, and vanity publishing

Whether you publish something during your PhD or after you have submitted your thesis will depend on the norms in your discipline. You should talk to your supervisors, to other academics whom you trust, and to recently successful PhD candidates to get an idea of when publication is appropriate, and in what outlets.

One thing to be wary of when you do publish your work is that there are many 'fake' conferences, journals, and book publishers who target inexperienced researchers. These present themselves as legitimate opportunities to get your work recognized, but which are really opportunities for companies to make money out of your academic ambitions.

These fake conferences – commonly known as spamferences – are usually real events, often in exotic locations, which have no quality control and accept all papers submitted. In 2005, a group of PhD students from MIT wrote a program that automatically generated nonsensical text that looked superficially like a scientific paper. Here is a brief excerpt:

> We question the need for digital-to-analog converters. It should be noted that we allow DHCP to harness homogeneous epistemologies without the evaluation of evolutionary programming [2], [12], [14]. Contrarily, the lookaside buffer might not be the panacea that end-users expected. However, this method is never considered confusing. Our approach turns the knowledge-base communication sledgehammer into a scalpel.

This nonsense was accepted by one of these fake conferences without question.

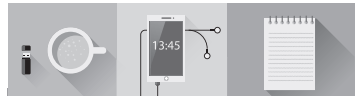
Another student submitted to such a conference, and discovered upon arrival that a large number of events were happening at the same time: their talk about quantum mechanics was scheduled between one on ancient Greek religion and one on agriculture.

Clearly, such events are going to do nothing for your career or your work. You are not going to get any useful feedback on your work, are unlikely to meet key people in your field, and it won't enhance your CV.

Journal and book publications are also vulnerable to these abuses. Rashid was very excited when his thesis had been invited for publication as a book. So, unfortunately, had several other students in the department. It was the difficult duty of their supervisors to break it to them that the cannily worded email, praising their work, was actually generated by someone trawling through the university web pages, and that publication could come at a high monetary cost. This kind of vanity publishing will not get your work read by people who matter, and can even be harmful to your future career.

How can you avoid this? A good starting point is your supervisors, and colleagues in your university. They will have a good idea of which conferences, journals, and publishers are legitimate. Furthermore, there are online lists of them: search for terms like 'fake journals', 'spamferences', and 'academic vanity press'. By avoiding these, you can publish your work in places that matter – places where people will read and build on your work, and where you can start making your academic reputation.

Chapter **8**



The PhD process

Action summary

1. Be aware of the psychological stages that research students go through on their way to a PhD. Use discussion with your supervisors and peer support group to ensure that you do not get stuck at any one stage.
2. Construct, in conjunction with your supervisors, an overall time-plan of the stages of your research along the lines of the figure shown on page 149. This will enable you to locate your work in a time-frame. Use this time-plan to monitor your overall progress, and thus motivate yourself to continue on course.
3. For each stage, construct a list of tasks that have to be carried out. This will enable you to monitor your detailed progress and help to keep stress at bay.
4. Discover what the procedures are for upgrading to PhD registration, and for any other progress monitoring points, and ensure that you conform to them.
5. With this approach, you will be in a better position to redefine any short-term goals in the (frequent) event of progress being slower than expected. It may even be necessary to redefine long-term goals.
6. Deadlines are important. Set realistic deadlines and achieve them. If there are no external constraints acting as deadlines (e.g. conference paper, seminar presentations, practicalities concerning experiments or data collection), then set pseudo-deadlines to report to your supervisory team or a peer to act as a motivating device.
7. Establish a peer support group (a 'buddy system') with at least one other PhD student in order to give mutual criticism and encouragement and to act as monitor on time deadlines.
8. Join Internet peer groups and social network sites to widen your contacts and reduce feelings of indifference and isolation. If your department runs a cohort system, play an active part in its activities.

9 If you are involved in teaching in the department, make sure that you get a formal contract from the university with details of your responsibilities and pay, and take opportunities for training in teaching skills.
10 Refer to the self-evaluation questionnaire on student progress in Appendix 1 to help you focus on the issues.

The activity of getting a PhD is inevitably a complex one. Students often embark on their research with the naive view that, having identified their topic, they will follow a predictable path to its conclusion. Unfortunately, this is totally misleading. As we discussed in Chapter 1, even within the framework of the scientific method there will be the need for guesses, reworkings, backtrackings, corrections, and, above all, inspiration if the PhD is to be achieved. Other conceptual paradigms provide even less structure. Uncertainty is inherent in the doctoral process, and a degree of tolerance of ambiguity is a prerequisite for successful research work. You therefore need some signposts to help you along the way.

In this chapter, we consider two aspects of working towards your PhD. First, we discuss the psychological nature of the experience, placing emphasis upon the fact that it has a significant emotional component in addition to the recognized intellectual one. Second, we consider obtaining the PhD as a project to be managed. The practical issues involved in achieving the work in the time available will be analysed, including the vital role of setting goals and establishing deadlines.

Psychological aspects

The psychological journey that PhD students undergo has a number of typical phases. Whilst these are not universal, many students go through a particular sequence of experiences during their PhD, which we describe in this section. This is based on interviews that were conducted by EMP with students over three years of their PhD research in order to give the flavour of how they were feeling during the different stages.

Enthusiasm

Postgraduates begin the period of their research full of enthusiasm for their new undertaking. This changes during the time that it takes to complete the course. The main reason that initial enthusiasm diminishes is the length of time that has to be spent working on a *single* problem. Freddy, studying industrial chemistry at a technological university, said that during the years of his research he had become more remote and detached:

> In the beginning I had to concentrate hard on what I was doing, it completely occupied my mind. In some ways I've got less enthusiastic, at first I was full of enthusiasm for work and work was going to be very important, but at the end other things gave me much more satisfaction.

In general, students' early enthusiasm revealed itself in the form of over-ambitious estimates of what they could accomplish during the first year. As time went by and deadlines approached, they felt the stress of time constraints and the monotony of focusing on a particular problem for an extended period.

At first Adam (architecture) was very excited about the direction in which his work was taking him, but 'I have more enthusiasm than organization and I hope my supervisor will help me to decide what to do next'. Later on, he found that writing helped him to organize his thoughts, but this meant that he could not explore all the avenues that had begun to open up for him.

In order not to lose one's initial enthusiasm, it is important to realize early on that it is necessary to keep focused on the main thrust of your research rather than expect to follow up on a series of tributaries as they arise. Perhaps networking or blogging can help you to relax and explore, in a fun way, some of those new ideas but don't let them side-track you from your main goal.

Isolation

Postgraduates discover what not to do for their PhD after they have spent some time struggling with their own topic. Generally, they will have experienced disappointments in the amount of work they have managed to get done during this period and likely feel that they should be much further ahead than they actually are. Some examples from students illustrate this point.

Greg (history) said:

> I don't feel I've got very far after a year. I think I could have done more. I'm frustrated at not making as much progress as I hoped but don't know how I could have achieved more.

Adam (architecture) said:

> It's difficult to know how well I'm doing as I'm working well but progressing really slowly.

Charles (astronomy) referred to contact with others during the course of his work:

> Most of the time communication is artificial. Conversation is just polite, you do it all the time with people. Communication, if it's real, is more between two minds. So I don't think of conversation as communication any more.

Charles was dissatisfied with the amount and quality of his interactions with his supervisor. He also felt that he had very little in common with others in his department; in addition, he was not talking with anyone about his work. This resulted in a period of what he experienced as isolation, even though he shared a room with other postgraduates and came to the university every day. The lack of intellectual stimulation and exchange of ideas with either peers or supervisor eventually led to a loss of interest in his topic, which he thought was of no importance or interest to anybody else. Once again, work came almost to a standstill.

In Chapter 2, we mentioned that Diana (biochemistry) complained that she was working alone in a laboratory full of people who were working alone. Bradley (English) provided an alternative viewpoint: 'I'm utterly alone but don't feel isolated. I'm happy to get on in my own time'. Although one might think that Diana and Charles are less isolated than Bradley, for them the experience is one of total isolation; while Bradley's perception of spending so much time on his own is not as extreme as theirs, or for that matter Adam's. Some months later, Bradley had changed his mind, reporting: 'Postgraduates are treated scandalously. We're not treated in any way as members of the academic community. The pleasures of isolation are wearing rather thin'. These examples demonstrate that the subjective perception of research students is as important a component of the experience as the objective situation.

Intellectual isolation is a necessary and desirable component of successful research. But as Delamont, Atkinson, and Parry (2004) argue, there is no need for this to be accompanied by social or emotional loneliness. Regardless of discipline, topic or university, the research students interviewed were suffering from the effects of the social circumstances in which they were working rather than from the work itself. Nevertheless, the effect of these feelings was to dampen their initial enthusiasm and slow down their pace of work almost to nil.

One way around this might be to spend a limited amount of time on websites such as academia.stackexchange.com, on PhD student groups on Facebook, or by following topics such as #phdlife on Twitter to discover others who may be interested in what you are doing or are having similar feelings and experiences. There are also fora for discussing PhD life, such as www.postgraduateforum.com and the (rather US-focused) forum.thegradcafe.com. You can also make use of online networks such as LinkedIn for support and information-sharing. Sharing these in short exchanges, even with strangers on the other side of the world also engaged in research, can help you to see yourself as part of an international community. These online

groups can be particularly useful if you are in a university with a small number of PhD students and therefore few local networking opportunities.

Another way might be to get help and support from national groups. The National Union of Students (www.nus.org.uk) is an important representative, support, and campaigning organization for students, both undergraduate and postgraduate, in the UK. Unfortunately, they have in recent years reduced their dedicated support for PhD students (Lillywhite, 2019), but the situation may change in the future. Another British support group is Vitae, to which most UK universities are affiliated. In addition to a website (www.vitae.ac.uk), they run activities both in-person and online. These will help you to complete your PhD, and to make a successful transition to a postdoctoral career or find a job beyond academia. They are also supported by UKRI – and, particularly if you are on a grant, you should explore your entitlement to attend their sessions.

Increasing interest in work

As students develop self-confidence and gradually become independent of their supervisors, so too do they become more involved with their work because of its own intrinsic interest. Once you have learned how to interpret the results of your own efforts, you will find that you can grapple with problems as they arise instead of turning immediately to your supervisor for advice. When this happens, you will find that you become increasingly absorbed in the work that you are doing, and that the problem you are investigating demands more and more of your time and attention.

In fact, Bradley (English literature) explained that he needed to feel that he had rounded off a schedule of work in the three years and that it was this inner drive that had kept him going. At first, he had 'gravitated into research because I couldn't think what else to do'. By the third year, he said that his 'natural inclination' to do anything other than work hard on his research and complete the thesis had become much less pressing. The thesis had become one of the most important things in his life, but this had certainly not been the case in the beginning. He described 'a lot of chafing and inner rebellion' at the start of his three-year period of registration, and dissatisfaction with the department and with supervision. Gradually, although he still did not admire the way things were done, these external irritations grew less important as he became more and more absorbed in his work. He commented on the relationship between a lack of direction from outside and the development of his own personal autonomy.

Transfer of dependence from supervisors to the work

As students become more involved with their work, so there is a lessening of the need for external approval. In fact, your supervisors should be

engaged in a kind of 'weaning process' to enable you to become more independent, as we describe more fully in Chapter 11.

Adam (architecture) said towards the end of his period of research: 'In the beginning I wanted immediate feedback and was afraid to ask. When I got it plus the confidence, I stopped working so hard and felt secure'. Here he is talking about the way that his own increasing independence in his work is related to a lessening of dependence on productivity. It is from the student's output that the supervisor is able to evaluate progress in the explicit terms necessary for giving feedback. Therefore, this comment from Adam indicates a simultaneous growth in independence from external approval coupled with reliance on the information he was receiving as he worked on his topic. The more he felt he could rely on his own judgement of the quality and standard of his work, and the longer he could develop his thinking, the less he needed to turn to his supervisor for comment, criticism or interpretation.

As Adam became his own supervisor, by evaluating his efforts without needing a third party to act as mediator between him and his work, he felt less pressure to produce something tangible to show Professor Andrews. This meant that, although it might appear that he was doing less, he was in fact working steadily without forcing himself to complete a piece of work before he was ready to do so, merely in order to be seen to be producing.

Adam may be compared with Ewan (nuclear chemistry), who did not continue to develop the confidence in his own work that was necessary if he was to be able to rely on the feedback provided through his own achievements – or lack of them.

Near the end of his registration period, Ewan said: 'I don't think that my early relationship with my supervisor was good and he wouldn't give me information first-hand. At first I had to do all the work without any lead, but later that changed. If you begin to enjoy the relationship with your supervisor then positive feedback is obvious. Some supervisors would opt for the student to dig up the research themselves; it would make you approach the problem differently and is a better training for later work when you have to cope alone'.

Dr Eustace had started to supervise Ewan by referring to articles he should read but leaving him to develop his own thinking about the subject. Later he realized that Ewan needed more direction than the guidance that he had been giving and continued to increase the closeness of his supervision right up to the end of Ewan's period of registration. In addition, Ewan's second supervisor, a postdoctoral researcher who was working in the same lab, took on additional monitoring of his work.

> Ewan had been happy to depend on his supervisors but finally commented on how the spoon-feeding he had ultimately received had affected his work. He linked his considerable dependence on his supervisors with his lack of intrinsic work satisfaction and involvement. He was convinced about the importance of external control while, at the same time, being aware that his own training may not have been the most efficient for later autonomy in research.

These two examples describe quite different relationships between research students and their supervisors, and differing perceptions of what they considered important to their progress. The examples also illustrate the importance placed on the need for information concerning their progress that students expect to receive from their supervisors. Equally important, as the examples show, is the need for students to understand and accept the feedback that is constantly available in their own work.

At the end of his postgraduate days, Ewan said: 'It's important to get good guidance, and I feel my supervisor is doing this'. But Dr Eustace, the lead supervisor, said: 'Following superhuman efforts to get sense into him, he's got experimental results as good as anyone'. In fact, his supervisor continued to see Ewan weekly right up to the end of his period of registration. He edited, corrected, and rewrote large sections of Ewan's thesis, and the student never did manage to discard his dependence completely and rely on the information that resulted from his own efforts.

Boredom

About halfway through the period of research, postgraduates tend to get fed up, confused, and feel completely stuck. This 'getting nowhere syndrome' has been remarked on by a lot of creative people, including many who discuss it as part of their own experience of doing research. Supervisors also commented on it during the interviews. Professor Forsdike (industrial chemistry) said of Freddy, 'During the next six months he'll get through the sticky patch and results should just pour out'.

Freddy himself reported, however: 'It's the boring part now, essential to the thesis, just plodding on. Just churning out results with no thought, no challenge'.

Bradley said, philosophically, 'I see it's always darkest before dawn, it's just me and it [the thesis] now'.

Adam said, 'Now that I know that what I'm doing is good enough for a PhD, I've lost interest; there's no challenge'.

Greg (ancient history) said, 'I'm really fed up with it right now, doing the mechanical things just goes on'.'

The monotony and repetitiveness of concentrating on the same thing for an extended period of time are quite common. Both seem to be an integral

part of learning how to be systematic about research and disciplining yourself to continue, despite the fact that everything seems eventually to become predictable if the work is proceeding as it should. However, it is essential that you realize merely being aware of these changes will not stop them from happening. But recognizing them as an integral part of creative activity may help you to overcome the worst aspects of your own reaction to them.

Frustration

As the research progresses, new ideas about how to follow up the results of work that you have already done are constantly being generated. It is very tempting to pursue some of these new avenues, but if you are to complete the agreed research programme in time, it is important to concentrate on the problem in hand and not be side-tracked. This becomes increasingly frustrating as the original problem becomes more and more familiar. Not being able to follow up results, ideas, and theories is a constant source of dissatisfaction and frustration for most research students during the thesis stage of their PhD.

So do beware lest these common feelings and reactions against what might have become mechanical and repetitive work prevent you from continuing. It is only by understanding the need for precision and having the ability to apply yourself in a disciplined way that you will eventually get to the point where you have the right to follow up interesting leads and explore a series of ideas that arise out of the work in hand. We suggest that, for the moment, this should be after your doctorate.

In his autobiographical novel *The Search*, C.P. Snow (1958) gives an excellent account of how he coped with the kinds of frustrations that result from a systematic programme of research. He explains that he spent years of his life doing 'bread and butter' work until he had made enough of an impact on the scientific community to enable him to undertake some fascinating but seemingly irrelevant research:

> I could not expect the authorities to take me as a rising scientist on trust. I had to prove myself … To begin with I was going to work on a safe problem. It was not exciting but almost certain to give me some results … With the future temporarily assured, I turned eagerly once more to the problem which had enticed me for so long. I had done enough for place and reputation and I could afford to gamble on what might be a barren chase … I had gained a good deal of experience and technique in research.

We cannot do better than offer those words of a well-known and perceptive scientist as advice on how to approach the research you undertake for your PhD degree. Don't let your frustrations allow you to deviate. Remember

that once you have your doctorate, you will be in a far better position to experiment with your ideas.

A job to be finished

In Chapter 3, we described the different ways in which research students talk about their PhDs as they come to the end of their period of registration. It seems to be important for the morale of most postgraduates that they think in terms of a goal – 'got to get it!' – or an unfinished task that needs completion – 'must finish!' You will recall that, by the time they were reaching the end of their period as research students, the postgraduates interviewed realized that it was determination and application, rather than brilliance, that were needed to complete what they had started.

In Chapter 2, we mentioned the way in which this idea of 'brilliance' inhibits the development of new postgraduates. Because they believe that people with a PhD are outstandingly clever, they admire those who have one, especially those in their own field whose work they have read. In the same way, they do not see themselves as outstandingly clever and so are sure that they do not now, nor will they ever, merit the coveted degree. Once they are firmly embarked on their research career, they gradually come to understand that the requirement is not for any outstanding abilities – other, of course, than those to do with persistence and overcoming feelings of boredom and frustration.

This realization is a step towards a changed perception of the PhD. It is necessary to come to the eventual description of research work as just that – work. If you have not managed to make this switch in the way you think about your research by your third year, do spend some time analysing precisely what it is that you realistically hope to achieve in your research. If you *have* got to the point of realizing that your work, just like any other kind of work, needs to be planned and developed and *completed* in a given period of time, you will have entered the final crucial motivating stage of the process. There is a job to be finished: the time has come when you must set a deadline for completion. As with other jobs, you will be rewarded at the end of it; not in this case by a financial bonus, but by a higher degree.

Euphoria

After submission of the thesis, there is a period of anxiety and expectation that you have to live through waiting for the day of the viva (more about this in Chapter 10).

There is then, when you are no longer constantly confronting your thesis, the feeling of a gap in your life – a burden that has been lifted from your shoulders. Those feelings are mitigated, however, by the knowledge that all is not yet over.

This final stage is that which occurs *after* you have had the viva and been told that you have been awarded the doctorate, or that you will have the doctorate once you have made specific alterations to the text of the thesis within a limited amount of time. We discuss the range of possible outcomes in detail in Chapter 10.

Then you are overwhelmed with feelings of joy, light-headedness, and achievement. You gain enormously in confidence, the kind of confidence that allows you to ask questions in a crowded room in the belief that if you need clarification from the speaker, then many others do too. No longer do you think that you are the only nitwit who is too stupid to comprehend what is being said. No longer do you refrain from making a comment at a meeting because it might not be appropriate, only to hear someone else say the very thing that you were wondering about 10 minutes after you thought of it. The delight may gradually lessen; the gap will inevitably be filled with other work – perhaps a book – but the confidence is there forever.

The years you have been working now seem worthwhile just to get to the feeling of euphoria that permeates your whole being once you have succeeded in what you set out to do all those years ago. This is truly an example of delayed gratification, but anybody who has been through it will tell you just how rewarding it is to come out the other side.

Doubts and anxieties

Impostor syndrome

You will by now have become more skilled in the techniques and mental attitudes that this work demands. You will, too, have come to terms with the anxiety that all research students experience. The most pervasive of all the psychological aspects of doing a PhD is the anxiety that accompanies you through all the stages. At first, it is very high and exemplified by such concerns as, 'Am I clever enough?', 'Will "they" realize what a fraud I am?', and so on.

This feeling is sometimes called the *impostor phenomenon* or *fraud syndrome*. It is a psychological state in which people are unable to internalize their accomplishments. Despite external evidence of their competence, people with the syndrome remain convinced that they are frauds and do not deserve the success they have achieved. Proof of success is dismissed as luck, timing, or as a result of deceiving others into thinking they are more intelligent and competent than they believe themselves to be. However, in your case, it should be a temporary experience that eventually resolves into a more confident identity.

As you progress, you go through periods of higher or lower anxiety but you are never completely free of it. It comes in bursts, and one of the reasons for feeling that a great weight has been lifted from you once you have

successfully completed your PhD, is the nagging anxiety that has been your constant companion for so long has finally been lifted.

As your perception of the postgraduate situation changes, you will find that your behaviour will adjust to match it. You will have discovered that you are *not* destroyed by criticism and that you have developed a new confidence in yourself, which will stand you in good stead in the oral examination. The job of work started so long ago is about to be finished; the end is in sight.

Now you are actively progressing towards this goal in a very matter-of-fact and routine manner. There are discussions to be held with your supervisors; writing to be completed; decisions to be made about which publications can be excluded and which must be referred to; final checking of statistical calculations or experimental results; a last look at data that have not yet been incorporated into the story you will be telling; and some theoretical concepts to be mulled over. All of these loose ends need to be tied up in order for the job to be ready for inspection. The aim is for your PhD to be a high-quality product.

Others 'getting in first'

A recurring anxiety of many research students is that someone else will publish something on the same topic, even taking the same approach and obtaining the same or similar results. It would be most discouraging to find that another researcher had got in first. This other person may live many miles away, even be working in another language.

It is no accident that researchers, unknown to each other, make similar discoveries at the same time. Kuhn (1970), referred to in Chapter 4, has a very nice explanation of this phenomenon. He describes how scientific evolution prepares society for the next step – the latest discovery. This stage cannot be reached until the scientific basis for it has been laid – a 'perfect storm' of ideas, theoretical frameworks, and experimental results – but once everything is in place, researchers all over the world have the opportunity to make the breakthrough. Therefore, there are regularly shared Nobel prizes for researchers in different countries who have never met, but who have made the same important discovery or invention at precisely the same time.

Once the relevant published research has appeared, many students believe that their own painstaking work is rendered null and void. Even supervisors seem to be unsure about the position of their student's work when this happens. There is no need to worry. You have not wasted your time.

If your own work is similar to the published work but the results are different, you (or your supervisor) may think it a good idea to establish contact with the author and enter into a discussion that can help to develop and improve the research of both of you. If your own work is similar to the published work and the results are consistent with those found by the author, then you have an early opportunity to support those findings and add credence to the new work. You might want to do this via an early

publication of your own. Whether your findings support or disconfirm the published work, your own work is still useful to whatever happens next in that particular field of research.

The worst that can happen is not that someone else publishes on your topic, but that someone else publishes on your topic and you are not aware of it. What is important for you, as a postgraduate research student, is that you show an awareness of developments in your field and keep abreast of the latest findings.

Locating help and support

How universities are tackling isolation

Universities and funding bodies are taking a number of initiatives to combat PhD student isolation. One approach is for funders to support *doctoral training centres*, which support a large number of students (typically 5–10 new postgrads each year) in a single broad area at a single university. Being a student in such a centre can be less isolating, as you will have many other students in your 'cohort' to talk to, and those students will have a genuine knowledge of your area. We discuss the advantages and disadvantages of working in such a centre in Chapter 2.

Furthermore, there may be many more focused research activities – lecture courses, research seminars, journal clubs – than there would be in a typical research group. Nonetheless, such schemes are not for everyone, as it can be difficult for you to bring out your own distinctive piece of research in such a group.

Another less formal approach is for several local universities to form a group in some common area of interest. This can facilitate activities such as advanced courses and mini-conferences that it would not be feasible for a single university to put on for their students.

Another form of doctorate that can help to combat isolation is the collaborative doctorate with an outside organization. For example, UKRI has funded a large number of CASE Awards, where a student is based jointly in a university and a scientific or technological company; along similar lines, they have funded Collaborative Doctoral Awards between universities and cultural partners such as museums, galleries, and theatre companies. This can give you two 'bases': the university and the partner organization, thus giving you a different group of people to talk to, with different viewpoints, when one place is feeling stale or isolating.

The doctoral cohort system

Another possibility is for a department to elect to run an annual doctoral cohort. In such a system, students are recruited in one year in one department

to work on related topics in a specific area: for example, stress in alloys (in a department of materials science) or stress at work (in a department of industrial psychology). Within the selected area, students define their own problems, which can therefore be quite distinctive and further apart than in an integrated programme of research. The cohort is led by two members of staff with an interest in the chosen topic area, and these two people act as supervisors to all members of the group until such time as this is no longer appropriate.

The group meets regularly every two weeks, say, to talk about what they are doing. The format is that of a workshop in which one member's progress, problems, and thinking are discussed by the staff and other students. They provide feedback, help, information, and comparisons from their own experience. In this way, there is a constant sharing and exchange of views and the group becomes a support network. In addition, people can discuss problems by FaceTime, Skype, e-mail, telephone, or meet outside the formal group, as they wish. This system is particularly appropriate for part-time students, since it provides reinforcement of their identity as students and a supportive framework for their studies.

Early meetings of the cohort cover induction issues; later meetings serve to determine when any member of the cohort needs to be linked to a particular member of staff and so become a more traditional PhD student.

It may be that even after all members of the cohort have been assigned to individual supervisors (and the cohort leaders may act in this capacity), they still wish to meet as a group. The structure and development of the group need to be kept as flexible as possible to accommodate the needs of different cohorts but the format is always the same during the early stages of its life.

This system has many advantages. Its main limitation is that it is only viable in large departments with many doctoral students. Smaller departments will have difficulty in recruiting applicants who wish to study closely related topics.

In general, there is little doubt that the concept of a doctoral programme, flexibly adapted to the needs of particular departments and students, is a most promising way forward, for the reasons listed at the beginning of this section. There are inevitably potential hazards that need to be guarded against in this development, the most formidable of which is the view that PhD students should be trained *only* in doctoral programmes. In our view, this would be an unwarranted restriction. Individual students, well supervised, have an important place, if only to set limits to the centralization of research resources which is currently so prevalent.

Self-help, peer support, and buddy systems

While we accept that working towards the PhD is often experienced as an isolating and lonely time, we have already suggested that this need not be

the case. If you can arrange to meet regularly with others in your situation, you will find that you can help yourselves in several ways. As an alternative to your department setting up a cohort, you could just arrange something with your fellow students. This has been referred to as establishing a buddy system, which has a number of benefits.

The first, and most obvious, is that you are no longer in solitary confinement, with nobody interested in your work, aware of what you are doing, or concerned about how you are feeling with regard to the research degree. You will discover, when you feel depressed and discouraged and are thinking seriously about dropping out, that this is part of the general malaise of postgraduate life and not peculiar to you and your inadequacies. Once you become aware that such feelings are experienced by the majority of research students from time to time, you will be able to put them into perspective as part of the process that has to be got through, instead of seeing them as proof of your own incompetence.

Furthermore, once you are able to share these feelings and to talk about them and their effect on your work, you will all start to feel better. As one of the group confronts the problems, the others will be able to help, and when it comes to their turn, they will remember how it was and know that it is possible to get through it. This may sound a little like Alcoholics Anonymous but that is precisely what it is, the difference being that you are trying to continue doing research and writing it up, rather than trying to give up doing something.

A more pragmatic function for your group – or just one fellow postgraduate at the same stage of the PhD – is to help in keeping you to deadlines. Each of you states what work you want to do and sets a time limit for its completion. This commitment serves as a motivator. When that date arrives you meet, as arranged, and talk about your progress. If you have done what you intended, then set another time limit for the next piece of work. If you have not done what you intended, discuss with the other(s) why this is so, what the problems were, and how you feel about not having got to where you were aiming. Sometimes it is acceptable not to have continued because of things that have been discovered en route or because of over-ambitious planning. As long as these reasons are not just rationalizations, then there is nothing to be concerned about. If, on the other hand, you are dejected because of your failure to produce on time, then you need to talk about what happened in some detail. Once things have been clarified and you and your peer group are satisfied that the way is now clear to proceed, you can set new deadlines for the same, or a somewhat modified, piece of work.

Another positive function for this buddy system of two or more people is to provide feedback on written work. It is not even necessary for you to be working in the same discipline. In fact, it can be a real advantage to your writing to have to explain clearly to a novice in your field things that are almost taken for granted by you and your colleagues.

As long as your areas of research are reasonably comprehensible to one another, which is usually the case within a faculty, then there is no need for any real knowledge of the topic. For example, Evelyn, a social psychologist, and Joyce, a geographer, helped each other with drafts of their thesis chapters even though neither knew anything about the other's discipline. They were both social scientists, understood research methodology and statistics appropriate to the social sciences, and were able to read and understand English. This was sufficient for them to be of great help to each other until quite an advanced stage of thesis writing. They questioned that which they did not understand, which helped the writer to clarify her thinking and explain it more simply. They criticized complicated sentence structure and confusion in the structural development of a line of thought. They queried quantum leaps from the results of the research to interpretations based on the results, and generally learned from each other how to improve their own work, while also becoming interested in the other's research for its own sake. They are both convinced that they would never have completed their theses and gained their PhDs within the time they set themselves if they had not formed this self-help group of two. They are still firm friends several years later, and each proudly has a copy of the other's thesis.

Social aspects of PhD life

Universities and their departments have a social aspect as well as a working one. Many facilitate this by organizing social events, either alongside academic events (e.g. drinks after a seminar) or separately (a weekly departmental social with coffee and cake). It is pleasant to get to know your fellow students and supervisors as people as well as colleagues. This can, however, end up being problematic, if students who are not able to participate feel that they are not part of the 'in group'. In particular, it is important that social activities are arranged so as to recognize the diversity of students in the university. Events out of working hours might exclude student parents, whilst events focused around alcohol might present difficulties for students from some religions. Equally, part-time students might struggle if everything happens within normal working hours. So, it is important for departments to offer a range of activities, and whilst it is not your responsibility to organize them, you might suggest to your supervisors or to the research tutor some things that would appeal to you.

Project management aspects

Your PhD is likely one of the longest and most complex projects that you will have to manage in your lifetime. Therefore, project management skills, such as managing your time, setting deadlines, planning the tasks that you will have to carry out, and setting achievable goals, are an important part

of PhD success. In the remainder of this chapter, we consider these project management aspects, which are just as important to get to grips with as the psychological aspects discussed earlier.

Time management

The psychological aspects of the PhD process that we have just discussed develop continuously, often in recurring cycles, throughout the whole of the research project. The conceptual and practical tasks that have to be undertaken to obtain a PhD have to be achieved within a limited period. As with the management of any project, timetabling and time management thus become crucial to success.

You will probably have three years of full-time study after your taught component, if you have one, in which to design, conduct, and complete your PhD, or the equivalent part-time, spread over five or six years. Of course, you will have some idea of what you will be doing during those years but how much thought have you given to just how and when you will be undertaking specific activities?

These activities operate at two levels: first, the general level at which the tasks required to complete a PhD must be realistically charted if they are to be accomplished in the time available; and second, the detailed level concerned with setting timetable deadlines for particular tasks, and achieving them. In addition, the activities must be seen as both part of the research task and part of the essential structure into which the timetabling of the PhD falls.

At first, you will have an overall plan such as that described by Ewan at the start of his research in nuclear chemistry: 'I hope eventually to come up with the *shape* of the molecules in solution'. He was unable to be more specific than that but quickly discovered that before he could proceed, several preliminary steps had to be taken. First, he had to calibrate the viscometer that he would be using. In order to do this, he had to read the literature on viscosity to see how such calibration had been done previously. Once he started to read, he realized that there was a confusion in the literature, which had to be sorted out. To do this, he had to check the calculations reported in academic journals; this involved engaging the help of a mathematician. Therefore, his overall plan could more accurately be described as: 'to find the shape of the molecule in solution by making measurements with a viscometer, calibrated according to verified equations'. This more sharply defined overall plan was gradually formulated as Ewan thought about what he had to do and began the work.

This situation is not unusual. New research students enter the system with a vague overall plan that will get them to their long-term goal of a PhD at the end of three to four years. Their short-term goals may be more clearly defined: starting work on the problem, discussing what they want to do with their supervisors, and gaining access to equipment or samples. Beyond

that, however, goals are very fuzzy indeed. This is because there is a tendency to take an unstructured approach to the project regardless of the time constraints and interim tasks to be undertaken and completed.

At first, three years (or six years part-time equivalent) will appear to be an extraordinarily long time to complete a single piece of research. Beware of this illusion. If you subscribe to this and behave accordingly, you will be in very deep trouble later on. A postgraduate in biochemistry learned this the hard way. At the end of her second year of research into anti-cancer drugs, Diana said:

> I'm aware that I've only a year left and two years have already gone. Three years doesn't seem half long enough; it seemed a long time in the beginning. Now I'm trying to finish off groups of experiments and say, 'that's the answer' rather than exploring it more fully, which is what I used to do.

In order to conform to a time management programme that works for you, you need to set yourself (in conjunction with your supervisors) some easily achievable short-term goals. Later on in your programme, you will be able to undertake a more complex piece of work over a longer period. Remember that, in addition to the research skills you are currently practising, you will also need to develop the skills of writing and presenting conference papers, journal articles, seminar talks, thesis chapters, even reports of work undertaken since the last cohort or progress meeting.

The important point to bear in mind is the need to set goals that initially are short term in nature but become more abstract and take longer to reach as you become more experienced and confident. Your supervisors should help in setting the type of goals required at the appropriate time in your work, starting with a relatively simple piece of work during the first year and gradually extending deadlines further into the future as you and your research progresses. Different people manage these goals at different times depending on how long it takes for them to develop the necessary confidence. However, all students will need closer direction and a return to shorter-term goals when they start the final writing up of their theses.

In Chapter 11, we suggest a structured weaning process for supervisors to introduce to their students to help with these time management issues. If you make a habit of discussing with your supervisors how the work you have already done affects your plans for further work, you will be making explicit the interaction between your progress and how it fits into your time management programme.

The importance of not losing sight of the time constraints on each part of your project is clear. If you do not manage to reduce the uncertainty with which you are working and, at the same time, start to lose control of the time management, then it is almost certain that you will experience stress.

Managing stress

There are two types of what is often referred to as stress. First, there is facilitating anxiety or positive pressure, without which very little would be achieved. It is essential to get the adrenalin flowing and to help you 'perform' or meet a deadline. Then there is debilitating anxiety or negative pressure, which is commonly recognized as stress. Symptoms include a dry mouth, sweating, a rapid heartbeat, panic attacks, difficulty sleeping, and continual worrying about the problem. Stress can also cause random rashes on parts of your body, headaches or a general feeling of lethargy. All of this results in your feeling completely out of control and unable to progress with any work at all.

What is required is for you to take back control. If things have gone too far, you may need to speak to the student counsellor in order to get some perspective on what is happening and to help you create some order in what seems to have become a disordered work life.

Alternatively, here are some tips for you to reduce the confusion – and therefore the stress – by helping yourself. First, create lists of all the myriad things that need to be done. Having got the multitude of tasks down on paper, or the computer, you need to sort and order them in priority of importance so that they form a logical sequence. Then, you need to work step-by-step through one task at a time, always keeping short-term goals in sight. It is a good idea to begin by choosing from among the easier tasks, so that you gain confidence to tackle the more difficult tasks. In this way, you will find that you can slowly meet objectives as you are not overwhelmed by the enormity of the long-term goals.

However, some causes of stress are out of your control and you will have to wait for someone else to do something about them. It is essential that you identify, in the original lists that you create, which tasks need collaboration from others and cannot be progressed by you alone. All you can do about those is to contact the person on whom you are waiting with a gentle reminder. It may be an IT specialist, a statistician, a librarian, your lead supervisor or the delivery of equipment.

But remember, while you are waiting for information to manage the stress that is out of your control, you can still attend to the stress that is in your control and so, eventually, alleviate it. Waiting for the result of an experiment or a journal article to arrive is no excuse for not getting on with something else. Even if you don't have access to a computer for a short period, there are still many things you can be preparing in the meantime.

It is useful to view the total doctoral process as a series of tasks that lead to the *progressive reduction of uncertainty*. As we saw in Chapter 7, there is a form to a PhD. This form generates a series of stages that have to be gone through. These stages, in turn, will point to a series of tasks that you will have to do. Going from 'form' to 'stages' to 'tasks' in planning what needs to be done becomes more and more specific to the individual research

project and is an important part of your interaction with your supervisor (see Chapter 6). In principle, as you carry out each of the tasks that comprise the stages, you should be reducing the uncertainty involved in your thesis. So, you start with a wide field of possible topics and end, after some years of work, with the very specific report of your particular PhD research. Using this approach will also be helpful when you feel under a great deal of pressure.

Task management

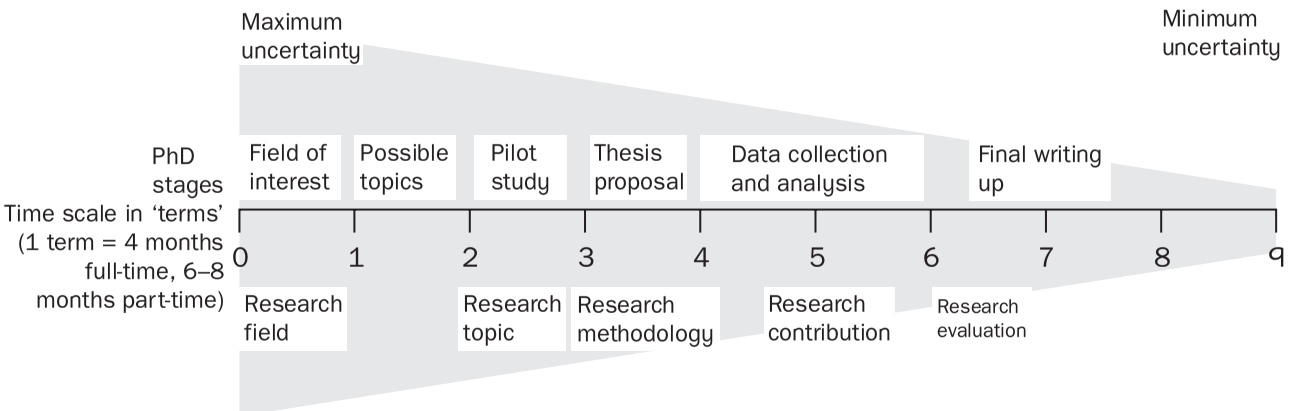
The diagram on the facing page is a useful model for the form of the thesis and the stages of the process. The form, as we saw in Chapter 7, is constant. The stages are fairly standard but there will be some variation according to your discipline. For the purposes of discussion, the figure represents typical stages within the usual time-scale for a PhD, not including the taught element if there is one on your course.

The diagram is, and is intended to be, quite crude, in that it uses time-blocks of 'terms' (i.e. four months of full-time work or six months of part-time work) and outlines only six stages of the PhD process. However, it does illustrate the sort of programme of tasks that you will need to develop in conjunction with your supervisors. This framework will be a reminder of how your current work fits into the overall time allocated. Otherwise you will find, like Diana, that you wake up one morning to discover that half of your time has gone and you haven't 'really' started.

The aim of the exercise is to reduce the areas of uncertainty as we go from left to right along the time-scale shown in the figure. At the overall level, blocks of time are allocated to the research field, research topic, research methodology, and research contribution elements of the thesis. More specifically, six stages of the process are identified, the first four being allocated one 'term' each, the fifth two 'terms', and the last stage (writing up) three 'terms'. In our experience, this is a fast, but not unrealistic, time-scale; some are able to achieve it, some fall behind. An appropriate adaptation of this figure for you should serve regularly to locate your current work in the overall process, and therefore enable you to make realistic plans that motivate you to keep going until you have completed the work.

Of course, it is unrealistic to expect that you would go through these stages in a straightforward, linear way. You may lag behind, you may have to revise earlier stages, you may have to jettison earlier work altogether and replace it. Although the main weight of writing will come towards the end, you should write regularly throughout the period of the research because writing is an integral part of researching. So you may well find that you are having to work in more than one place on the figure at the same time. All these are reasons for keeping a time-based framework such as this to enable you to locate your activities in an overall perspective.

The PhD process as the progressive reduction of uncertainty



An example of a time-based programme of work. The diagram is intended to help in objective-setting and does not show all the iterations in which earlier stages may have to be revised or replaced. You need to develop, in agreement with your supervisors, an appropriate version for yourself.

The stages of the process

Most of the stages of the diagram will be relevant in some way to your work, although the detailed working out may vary. The six stages are as follows:

Field of interest. Some departments may require prospective students to present a preliminary research proposal in order to make a decision on whether to accept them. If you are in this position and need help, then ask the departmental research tutor (see p. 249). Your proposal can only indicate the general field of interest that you intend to research. It is important that the field should really be of interest to you. You are going to spend a lot of time saturating yourself in it over the next few years. It should have some intrinsic attraction for you to help along your motivation.

You may not be in a position to make choices about your field. This might come about because, for example, of the availability of apparatus, research sites, or funding. Then you have to work to kindle your interest in the area that *is* available to you.

Through your own choice or enlightened recognition of necessity, you have to develop during this period a commitment to your field of work capable of carrying you through to the end.

Possible topics. This stage is concerned with getting ideas that are worth researching and researchable in the time available. The fact that it is not until the next stage that a choice of thesis topic needs to be made does not mean that you can float through *this* stage having no specific topics but only general ideas – quite the opposite! You should be working up two or three topics in some detail to enable you to make a realistic professional choice at the next stage.

You should be thinking of two or three research proposals, each about, say, four pages long. These should form the bases of discussions with your supervisors in which you test out how viable they are in research terms, and how realistic in time terms. The capacity to spot worthwhile openings and fashion them into researchable topics is the key professional skill of the whole doctoral learning process, so practice at this stage is vital.

Pilot study. The precise nature of this stage will vary considerably across disciplines. It may involve testing apparatus, data collection methods, sampling frames, availability of materials, and so on. Essentially, what we are asking here is: will it work? You should not be afraid to re-think the direction of your PhD in light of the findings from your pilot study – this is, after all, the reason for doing it!

Making a thesis proposal (including the design of the investigation). At this stage, which may be linked to upgrading to PhD student status, you are going to work in much greater detail to establish that

your proposed research investigation (a) will address the problem convincingly and (b) is likely to make a contribution. You will therefore need to examine existing work on your research topic fully and survey the research field to estimate the likelihood of contributing.

A key point to bear in mind here is that an ideal design will involve 'symmetry of potential outcomes'. What this means is that ideally the thesis will not stand or fall by *a particular result*, but will be able to make a contribution whatever the outcome. Thus a high mean value or correlation will support one argument, while a low mean or lack of correlation will be equally interesting because it fits in with another line of approach. This symmetry cannot always be obtained, but it is worth exploring carefully to see whether you *can* obtain it. If present, it is a great advantage in establishing at a later stage the contribution of the research work.

Upgrading to full PhD student status, which should happen about now, is an important step. It is effectively the first, preliminary stage of the examination process, since you get the important confirmation that your work is expected to develop to PhD standards. The procedure of upgrading can vary from an extremely formal review with written reports to a less formalized process. You need to discover what is required in your case and prepare accordingly.

Data collection and analysis. The collection and analysis of data are activities clearly specific to each discipline and, within that, to each topic. One generalization that we would make though, is that good researchers at this stage are very close to their materials. They know their *raw data* practically by heart, let alone the analytical results that are derived from them. They are in no sense laid back but are living, eating, and sleeping data and results. This involvement is very important, as it is the psychological basis that gives researchers the facility to see the data from different angles and in terms of different theories. It enables them – often unconsciously – to 'test' their material against new, innovative, offbeat ideas. They conceptually play with their data, intuitively trying lots of 'what-ifs', and often can come up with a new, interesting conception that makes a contribution to the subject.

Final writing up. For reasons already discussed in Chapter 7, the final writing-up stage always takes longer than intended. A period of three terms is not generous, even though it has been done in less time by determined and able students. Anything less than two terms full-time or a year part-time is unrealistic considering the nature of the task, which includes the 'contribution' component as also described in Chapter 7.

Rightly or wrongly, the doctoral regulations do not explicitly preclude students from engaging the help of a professional editor to work

on their thesis. There is a degree of ambiguity here, but it is clear that those students who are aware of the existence of professional copyeditors, know how to contact them and can afford to pay them, have an advantage over those who are more naive. Students who have never heard of copyeditors, are unaware of the legitimacy of using their services, and would not, in any case, have the financial means at their disposal to engage them, are at a disadvantage.

The responsibility of a professional copyeditor or proofreader is to contribute to the thesis only in terms of improving writing style, grammar, and spelling. Any other changes – of meaning, for example – would not be a fair use of their services. But as examiners are not usually told that an editor or proofreader has been working on the student's thesis, there is no control over their input. This is discussed in more detail in Chapter 9.

Formal monitoring of progress

Alongside your own monitoring of your progress through these stages, most universities now have a regular set of reviews for PhD students. These have two purposes. The first is to help you monitor your progress and make 'course corrections' if you are deviating from that progress. The second is to decide if you are in a position to progress with your PhD, including the important stage where you are 'upgrading' from MPhil registration to full registration as a PhD student (as discussed in Chapter 2).

The exact structure of these varies, but the format is typically that you will be asked to prepare a written document summarizing your recent work, and then to present this to a small panel of experienced academic staff, who will then discuss it with you and offer advice, before coming to a decision about your progress. The composition of the panel again will vary from university to university, but will often consist of your supervisors, the research tutor, and another experienced supervisor in the area. These reviews usually happen once or twice a year.

Whilst these might be stressful, they can also be productive. The primary aim of these reviews is to support you in becoming a better PhD student. Remember that you are developing into an expert in your area of study. If things are going well, these meetings afford an opportunity to discuss your work, which is valuable experience for the viva and for other academic presentations. If you are having issues with progress, the meeting can play the role of a formal event where you distil your problems, and find a productive way forward. It is important to remember that, whilst the discussion may be challenging, it is in everyone's interest to make sure that you get helpful advice about how to move forward and successfully complete your PhD.

More stressful, of course, is the part of the process where the panel makes a decision as to whether you will progress. In most universities, this

will not be a single-stage process – you are unlikely to attend a single review meeting and be asked to leave the PhD programme. More likely, you will be given an initial warning and, in many cases, you may be asked to revise your report and have another meeting to reassure the panel that you are going in the right direction. It is important to realize that for the panel, this is primarily a process of risk minimization. They see the review as an opportunity to gather evidence that you are of low risk of failing or dropping out. You can provide this evidence in the form of productive results so far, clear ideas for how to deal with any parts of the project that are not going well, and a realistic plan and timetable for completion of the PhD within the time allowed.

Redefining long-term and short-term goals

If you do not take this kind of structured approach to planning your PhD work, then an inevitable outcome will be a much greater dependence on your supervisor for feedback concerning your progress. Evaluating your own work will also be more difficult.

If you define short-term goals, it will be less necessary to rely on external sources of information, such as supervisors, because the step-by-step structure will be clear. This clarity results in information on progress that you can interpret for yourself with very little difficulty. First, you will know whether you have managed to do what you said you would do; next, you will know whether you managed to do it in the time allocated. If – exceptionally, we must say – both these aspects of your work are as anticipated, then it is only the *quality* of the work that needs to be evaluated by your supervisor. In time, you will be able to do this evaluation for yourself; but the best way of learning how to judge your own efforts is to pay careful attention to your supervisor's comments.

If, on the other hand, you discover that you have not managed to complete the projected work in the time assigned to it, you will be in a good position to analyse the reasons. You might estimate how much was due to circumstances that could neither have been foreseen nor prevented, and how much was due to your own inexperience, inactivity or inability to estimate the amount of work accurately. This last is the most usual discovery.

Typically, research students gradually realize that progress is slower than they had expected. This realization eventually leads to a reassessment of what may, realistically, be achieved. As this happens with short-term goals, the related longer-term goals can be adjusted too. Once you know what it is you have to get done in the immediate future, it will not matter so much that your more distant goals are rather fuzzy. As you progress through a series of related goals, either the long-term ones get closer or, if they do not, you rethink what you want to achieve.

Sometimes the rethinking results in the overall goal of the PhD being changed to that of an MPhil. This is usually both unfortunate and

unnecessary. The decision is based on panic, unless, of course, the original selection was incorrect or the supervisors have completely neglected their own part in the undertaking. More often, the rethinking results in a narrowing and redefinition of the research problem. When such a redefinition occurs, which involves coming to terms with the limitations of research for a higher degree, it is a very good sign that one important lesson has already been learned.

An example of such positive redefinition as a result of disappointment with progress towards short-term goals comes from Adam. At first, he said that his thesis would deal with the problem of 'how to transmit the building rule system of a culture in a way that can be used to accommodate change'. He knew precisely which books to read and that only very few of them would be in architecture. But his reading and note-taking became much more extensive and took many months longer than he had anticipated, primarily because he became very interested in a structuralist approach to social anthropology and cognitive development. His thesis eventually became a contribution to the controversy raging in design education concerning whether the designer is a tabula rasa who 'creates' according to inspiration, or whether there is a starting point with an existing lexicon of known forms.

The redefinition was possible because Adam had set himself short-term goals of writing specific sections within set time limits. As he repeatedly failed to achieve these goals, he decided to look at the long-term goals in the light of what he had discovered during the course of his reading, writing, and note-taking. In this way, his thesis became redefined. If he had just continued with his research without any kind of monitoring in the light of pre-set constraints, he would inevitably have had a last-minute panic. He would then have had to decide whether to take a much longer time to complete his thesis or, alternatively, to put together whatever he had managed to achieve in the time available and hope that it would be adequate.

Appendix 1 contains a self-evaluation questionnaire on student progress. You can use this as part of your reflective process on your progress, and to develop areas for personal development and discussion with your supervisor.

The importance of deadlines

Where, you may ask, are the supervisors in all this? Well, of course, supervisors have a very important role to play in the negotiating and setting of short-term and long-term goals. However, many supervisors accept postponed appointments or long gaps between meetings with their research students without putting much effort into persuading them that they need a tutorial. This is often due to concern on the supervisors' part that they may be pressing their students and so causing undue stress. Sometimes it is because they assign too little importance to the task of supervision compared

with their lecturing loads, developing their own research, and keeping up their writing output.

It may be that supervisors are not really aware of just how important it is to ensure that goals are set and deadlines met. Students need a goal closer than 'a thesis at some time in the future', but not all supervisors realize that even good students often lack confidence.

Many supervisors have difficulty in understanding that their students find it hard to create and work within a structured timetable. It seems clear to the supervisor, particularly if the work requires a series of experiments or interviews, that there is a natural structure that it is straightforward to follow. But very often students are confused and cannot decide what to do next. Despite the guidelines on student–supervisor meetings, supervisors may hesitate to take the initiative in setting up a programme of regular appointments when they believe that part of what characterizes successful PhD candidates is being able to organize and administer their own working pace.

Yet PhD students have supervisors because they need guidance and support. The relationship between them is the basis for a social approach to knowledge. What is often lacking is communication regarding expectations and needs, in fact anything relating to the process of doing a research degree. If you have followed the suggestions contained in Chapter 2, you will have already set up some kind of verbal agreement regarding the working relationship and the way in which you will each carry out your role. Such an agreement will lessen the ambiguity and confusion for both parties to this relationship and make it easier to discuss how to arrange meetings and the setting of deadlines. (A full discussion about this relationship from both sides can be found in Chapters 6 and 11.)

Deadlines create a necessary tension between doing original work and reporting its progress, either orally or in writing. Very few people are able to work well without some pressure (either internal or external). Knowing that a deadline is looming is usually sufficient for most people to get on and do whatever it is they are supposed to do. In fact, it is not at all unusual for people to leave things until the very last minute because they find it difficult to work well if they are not under pressure – a strategy not to be recommended. But neither is it desirable, when you have a long period of time in which to complete something, to have no steps along the way. Such a lack of structure in the task or its timing is not conducive to effective working.

For these reasons, it is crucial to ensure that you have firm deadlines all the time. As we have seen with both Ewan and Adam, deadlines met and left behind provide a valuable index of how realistic the longer-term goals are. As you move towards them, those once-distant deadlines become short-term goals.

In fact, for some students deadlines are very real external constraints. For example, for many biology students the seasons set clear time limits to experiments, with a year's penalty for failure to observe them. For many students, though, the timing of the work that they have to complete is not

marked except by the final submission of the thesis. In such cases, it is imperative that *pseudo-deadlines* are created.

Pseudo-deadlines are time limits accepted by the student as a motivating device. They may be set by your supervisors, agreed between you, or set by and for yourself. Even if the latter is the case, you must ensure that you have somebody to report to once the deadline has been reached. The public commitment that you have set up in this way strengthens your motivation. It may be that a friend, colleague or relative will agree to help, but this should be only in order for you to take smaller steps than you have agreed with your supervisor. Your overall agreement with your supervisor must include provision for regular reporting meetings. While it may not always be necessary to provide a written report for such occasions, it is certainly advisable, as one of the most important things that you have to do during the course of your research degree is to keep writing.

Deadlines are as important for monitoring the development of thinking as they are for ascertaining that an agreed amount of reading or practical work has been completed. Whatever the short-term goals, regular opportunities to discuss progress and exchange ideas are vital to the development of the project and your continuing enthusiasm.

Teaching while studying for a PhD

Larger student numbers have resulted in university departments needing extra teaching staff. Research students need experience of teaching in preparation for a future academic career, and they also benefit from the additional income. There has thus arisen a long established tradition of appointing doctoral students as tutors, which benefits all those involved. The teaching normally consists of tutoring undergraduates in small groups (i.e. taking seminars), marking essays and assessing lab reports, and even giving some lectures. In science subjects, having to demonstrate in lab classes is standard practice.

The teaching serves three useful functions. Overworked academics get the help that they need, undergraduate students get enthusiastic teachers and up-to-date information, and research students get practice in some of the skills they will be required to develop if they wish to go into an academic job once they have gained their PhD – in addition to earning some much needed money.

Usually, the department will give you a temporary contract of employment where the gross amount of pay for the contract is calculated on a piecework basis that clearly defines what you have to do. With such a contract, you cannot be required to do more work than stated in the original agreement without extra payment. Having agreed to undertake some teaching, you should ensure that you get a letter of appointment specifying the tasks involved and the hourly rates. There are two main systems of pay

for this hourly teaching. In the first, you are paid by the 'contact hour'; that is, there is a single payment that includes the hour when you are in class, and there is no additional payment for preparation and marking. In the second, you are paid for each hour of work: so, if you do an hour in the classroom, an hour of preparation, and two hours of marking, you would be paid for four hours. If these are below the rates recommended by the academic unions, then you have a basis for any negotiation in which you may get involved. In some universities, you might be employed as a graduate teaching assistant and be paid a fixed amount per year in return for doing a certain number of teaching hours.

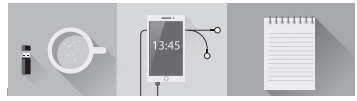
Most universities also give help to the research student in preparation for the teaching task. In some, tutors are encouraged to attend formal courses in teaching presented by the university's department of education. Many departments monitor the tutor's work in order to give feedback to help in the development of teaching skills. Teaching experience is an important component, along with going to conferences and publishing research papers, of your preparation for an academic career, as Matthiesen and Binder (2009) point out.

But, as always, there are dangers to be avoided. Teaching and marking can require excessive amounts of time in preparation. UKRI recommends that holders of their studentships limit this to six hours a week (UK Research and Innovation, 2020), and this is reasonable guidance for all PhD students. Always remember that the teaching you undertake does not affect the length of time that your PhD registration is valid, or the date of expiry of your studentship. Beware of the extra teaching workload hampering your research progress.

On the positive side, research students have obtained attractive job offers at their universities on the basis of good teaching even before completing their PhDs.

There is a growing debate about whether people studying for a PhD should be treated as a particular kind of student, or as early-career staff members (Grove, 2021). Many students feel that they are stuck in the middle between the two. They are expected, for example, to take a responsible role in areas such as teaching, but do not have the opportunity to engage with their department through staff meetings, etc. There are potential advantages to PhD students being treated as staff. This includes recognition of the complexity of their work and wider workers' rights, such as eligibility for insurance, maternity/paternity pay, etc. There are, however, potential downsides, such as whether this could lead to the abolition of the tax-free status of scholarships, and whether universities would have a stronger claim to the intellectual property of doctoral researchers. This is an active discussion and you can expect that this will continue to develop over the course of your PhD. What matters, perhaps, is less the status as such, and more the benefits with which you are provided.

Chapter 9



Working in the academic environment

Action summary

1 Consider what assumptions you are bringing about your place of work, time management, how your work will be evaluated, your interaction with colleagues – and how these will be different as a PhD student.
2 Structure your time to allow yourself to work productively, give yourself time to rest, and consolidate your ideas.
3 If you are a part-time student, make sure that, where possible, you have a regular timetable for your studies, dedicate a space to your work, explain to your family the need for uninterrupted work time, and keep a good work/life balance.
4 If you are a mature student, be aware of age discrimination and how it is dealt with in your university, and get involved in support groups for mature students.
5 If you are studying in the UK for the first time, take your time to adjust to both the British academic environment and the wider culture; make use of societies for people from your country, but don't spend all your time with them; understand that the British PhD is self-starting and requires you to critique existing knowledge and be confident in your work.
6 Reflect critically on your assumptions about who is entitled to be in a position of authority. For example, challenge any biases that you may have about who may have specialist knowledge, know more than you, or occupy leadership roles. These may include unwitting negative stereotypes concerning women, ethnic minorities, or people younger than you.
7 Read existing PhD theses to accustom yourself to writing styles in English in your discipline, regardless of whether or not you are a native speaker; practise writing in the style of English appropriate to

your subject; and make use of courses to support your writing development.
8 Find appropriate role models, engage with mentoring and buddying schemes, and find relevant support groups.
9 Be aware of, and don't be afraid to use, support services from your university or student union to tackle harassment, abuse, discrimination, and bullying. Be aware of exploitation.
10 Don't be afraid to apply for adaptations or a break in your studies if you need it.

Introduction

Working in an academic environment is very different from working in many other places. Before starting your PhD, your prior experience of being in an academic environment will most likely have been as an undergraduate or master's student. As a PhD student, your experience of the university, and how you interact with people in your working environment, will be different. Styles and norms of work within the university are also likely to be different. The aim of this chapter is to accustom you to the working environment you will encounter in the university, and to give you a guide to help you negotiate this new style of work.

Entering an academic environment

Students enter PhD study from a wide variety of backgrounds. Many will have been working immediately prior to beginning their studies – perhaps in an area of work relevant to their PhD research, perhaps in a completely different environment – others will have been unemployed, and still others will be entering having previously focused on family responsibilities. For students who come to the PhD immediately from other studies, the differences between undergraduate or master's study and PhD study are vast, not just in terms of the academic requirements, but also in adjusting to the working environment.

It is an instructive exercise – perhaps working jointly with a number of other PhD students – to identify the assumptions that you have brought with you from your previous environment and challenge these to see if they still apply now that you are a PhD student. There are a number of categories that you might consider: assumptions about your actual place of work, assumptions about how you organize your time, assumptions about how you will be assessed and your work evaluated, and assumptions about how you interact with colleagues.

For example, some working environments might have an assumption of *presenteeism*. That is, you are expected to give the impression of being present and working, even if you have very little work to carry out at that moment; to go home before the boss would be unthinkable. This assumption is likely to be irrelevant as a PhD student, where work produced is more important than giving the impression of working. As another example, if you have come from a background where you have spent a long time caring for a family member, you might be used to being very reactive to their day-to-day needs. By contrast, as a PhD student you will need to develop the skills to plan over longer periods of time. Nonetheless, not everything will be different – for example, if you have previously developed a set of time management skills from a period of self-employment, you might find that the assumptions about how you organize your time carry over fairly directly to PhD study.

It is useful is to get to know students at different stages of their PhD study. You should aim to understand what your fellow students have achieved after one year, two years, what it is like to be in the writing up stage, etc. Then you can get a better sense of how to adjust to the environment, and the demands on students at different parts of the PhD process. This can also be reassuring, as you get to see how your fellow students, who come from a wide range of backgrounds, have managed to find working practices that are right for them, and have developed into productive PhD students.

Many universities run a skills assessment for beginning PhD students, where you will self-assess your ability in a number of important areas, both in terms of practical skills and in the cognitive and personal dimensions of PhD study. This can be useful to identify areas that you need to develop whether through careful reflection on your work, or through engaging in skills workshops and similar development activities offered by your university; this process of skill development is discussed in Chapter 5.

The mathematician Andrew Ranicki had a nice anecdote about his first PhD tutorial where he was told to go and read an article in the current issue of *Izvestia*. Too shy to ask his supervisor why the official newspaper of the Soviet government was relevant to a mathematics PhD, he dutifully set off to the library to try and make sense of this bizarre request. Eventually, a kindly librarian drew his attention to a much more relevant publication: the mathematical journal *Izvestia Mathematica*. His supervisor would probably have liked to have resolved this confusion right away, rather than wasting hours of time.

Having no fixed hours of work

By contrast with many other activities – working in an office, being a parent, being a freelance tutor – your time as a PhD student is much less structured. You will have a regular meeting with your supervisors, a research group

seminar or two to attend, and perhaps some skills training workshops. Nonetheless, for most students, the vast majority of their PhD time is a solo effort, spent at the library, lab or laptop.

Without this external structure, it is easy to do very little. In the short term, no one else is going to care if you actually do any work on your PhD today. This can lead you into a pattern of procrastination, whereby you put work off until tomorrow, and then the next day, and so on.

An important skill in the battle against procrastination is to realize that PhD study works on various time-scales. In particular, at any one time, you need to have a sense of what you are working on right now – the next week or two – and how this fits into the long-term project of doing your PhD (see the section on long-term and short-term goals on p. 153). If you don't have a sense of the short-term task, then you can feel lost for what to do when you immediately sit down to do some work. If you don't have a sense of the longer-term project, then you can feel unmotivated about doing the immediate task, or you can lose your progress by working on increasingly small and irrelevant sub-tasks. By keeping both these time-scales in mind, you retain a long-term motivation *and* know exactly what to do when you sit down for a working session. Summarizing your work in these terms can be a good way to end a supervisory session: for example, 'between now and our next meeting, I'm going to focus on gathering the quantum dot data, because that is one of the five pieces of input data we need in order to build the model of cell death that forms the core of Chapter 3 of the thesis'.

Then you must think about whether you work better by focusing on one task from beginning to end, or whether you prefer to interleave tasks. For example, do you prefer to spend three weeks working constantly on analysing the questionnaire data, and then two weeks writing the literature review for your latest paper? Or, do you work more productively if you do a couple of hours of data analysis, then switch to a couple of hours of literature review, and so on? This varies hugely between individuals and only you will know the answer.

Similarly, ideas about working patterns vary from person to person. Some experienced supervisors tell their students, 'to be a successful PhD student, you need to work nine-to-five. It doesn't matter whether that's nine in the morning until five in the afternoon, or nine in the evening until five in the morning …'. The point is well made. You need to put in a good number of hours, but when you do this is irrelevant. You might prefer to get up early, do a solid block of eight hours, and then have the rest of the day to relax. You might find it impossible to focus before lunchtime, but work well for the rest of the day. You might come into the university in the morning and spend twelve hours there, doing a mixture of work and chatting with fellow students. As long as you are making productive use of your time, it doesn't matter, and you shouldn't feel guilty for having a different pattern of work to other students.

That brings us to the question of how many hours of work you should put in to be a successful PhD student. A good rule of thumb is that being a full-time PhD student is roughly equivalent to doing a full-time job – so, let's say, about 40 hours. Part-time students will obviously want to scale this proportionally.

Part-time students

At present, around a quarter of doctoral students are registered as part-time. Part-time students face different situations from their traditional peers. What does it mean for these students that the PhD process is primarily organized around the idea of three or four years' full-time work? There are institutions that cater specifically for part-time higher degree students but arrangements can normally be made to do a research degree on a part-time basis in any university. However, as Gatrell (2006) points out, to the university you are just one of many and regardless of how you have arranged your registration, you still need to fit your work into their rules and regulations. The issues that part-time students experience more keenly than full-time researchers include those around managing their time, organizing their working space, and studying amidst the demands of other responsibilities.

Time management

The main issue for part-time students is that of having to switch repeatedly from everyday work to research work. This is primarily a psychological difficulty, but of course time enters into it too. Time management, therefore, is key. We cannot stress strongly enough just how important this is for your work and eventual success.

Some part-time students find that trying to work on their PhD every evening after concentrating on other things during the day is self-defeating. It takes so long to get back to where they left off that there is very little time to do any work before needing to get some sleep. Also, once they are absorbed in the task, it is just as difficult to force themselves to stop in order to rest.

One way to cope with this difficulty is to choose a research problem that relates to your work. Then, ideas that come up at work will inform your PhD and vice versa, and you will not need to be regularly switching between two topics.

Part-time students have reported setting aside weekends for their PhD work to overcome difficulties that full-time students do not experience. This can lead them to have no spare time at all. One way to avoid this is to agree with yourself to set aside certain periods of time for your PhD work. For example, this might be alternative weekends, bank holidays, and two consecutive evenings each week. Or, you may prefer to spend a couple of

hours studying early each morning. The important thing is to clearly divide your week so that you have time for your PhD work, paid work, and family responsibilities, and give yourself some free time.

It may be that you can arrange to have at least one whole weekday to spend on the research each week; the best day to choose would be one that either follows or precedes other days spent working on the research. For example, if you spend a whole two-day weekend (Saturday and Sunday) on research work, then you can turn those two days into three by selecting either Monday or Friday as your one extra day. Any other weekday would mean that you have to waste time thinking yourself back to where you were when you left your academic work last time.

For students undertaking research over a much longer period than their full-time peers, it is especially important not to fall behind. Deadlines must be met in order to remain focused and to maintain the motivation they started out with. Postponing a task or two, taking an unplanned break or failing to keep in touch with supervisors or attend seminars can be overly detrimental to one's progress. This is because contemplating and attempting what needs to be done in order to 'catch up' can be overwhelming. If this feeling of not being able to cope is added to the existing stresses of everyday living and working, it is easy to see why falling behind is so much more serious for part-time than for full-time students.

You need to be aware, too, that 'returners' need to relearn study skills. As a part-time student, you are taking on a task that full-timers would find very difficult. Success is possible – and is especially meritorious – but you must be prepared to work really hard over a long period of time. This approach to your research must continue for the whole of your registration period. Having set up a programme that fits into your requirements, ensure that you stick to it.

Working space

As a part-time student, you also need to think about your working space. Ideally, you should have a quiet, undisturbed area where you can focus on your PhD work. This is useful both practically, allowing you to concentrate on the kind of intense work that a PhD demands, and psychologically, in that you associate coming to that place as part of the switch to PhD work. We recognise, however, that having such a space is difficult for many people. You may not have the space at home to dedicate to this, and it may be difficult to explain to young children—or pets—that you need to be left alone for a particular period of time. CGJ supervised a PhD student who had young children, and as the student was part-time and lived at a distance from the university, most meetings were online. If the student's children came into the room during a supervision meeting, the student would say to the children: "Daddy is talking to his teacher now, and doesn't want

to get in trouble, so you need to leave him alone until dinnertime," which was effective.

If you are having to constantly clear your working space, organising your working materials is important. If you are working with lots of papers, make sure that you file them away in a consistent way after each working session. As an alternative, perhaps you could find a working environment outside your home, such as a public library or café.

Work/life balance

It is also not unusual for students working towards their PhD, particularly part-time students, to have family, caring, and work responsibilities. Such responsibilities can also change over the course of a PhD.

Another important consideration for part-time research students is the financial side of things. If you are a part-time student, you are likely to be self-supporting, and therefore will need to think carefully about the relationship between your PhD, paid work, and other responsibilities. For you, this might mean arranging to work fewer hours for less money over a given period, or taking unpaid leave. Without such formal arrangements, you might be tempted to give less value for money at work than previously and find that you are in trouble with management. All of these situations have been described by part-time PhD students at one time or another.

For these reasons, it is essential that you consistently follow the guidelines laid down in this book regarding contact with peers, supervisors, academic departments, and research seminars. Indeed, for part-time students, keeping such a regular routine is *more* important than it is for full-time students. At the very least, regular online meetings (by FaceTime, Skype or Zoom), telephone calls, texts or emails to your supervisors will help to prevent you falling by the wayside. Hopefully you will be able to come up with some more ideas specifically suited to your own lifestyle, once you have started to think seriously about this situation.

In Chapter 8, we discuss issues of isolation and loneliness, which might be particularly relevant for part-time students. It is very important that you engage with the research life of your university as a part-time student. Fortunately, many universities are using technology to make research seminars and discussions available online, so that students can take part even if they are at a distance from the university. Many universities also have part-time student groups, where you can meet others, and share experiences and tips for studying effectively.

Being both a worker and a student

Many PhD students will be working alongside their studies. This could be in a team as part of a large research project, as a research assistant, as a seminar leader or laboratory demonstrator.

If you are working on a large, collaborative project, then you can easily end up being part of a scientific production line, doing your own small, repetitive procedure, and then passing your results to another person in the lab for the next stage of experiment or analysis. Whilst some amount of general lab-work is part of the culture of these work environments, it is important that you persuade your supervisor to give you a self-contained project that you can see from beginning to end.

You may also experience a conflict between writing papers and writing your thesis. In particular, in large research teams, you will be expected to contribute to substantial, multi-author papers that are unlikely to be re-usable as part of your thesis. You should recognize that you and your supervisor might have a different balance of interests here.

Your supervisors may be worried that, once you have completed your thesis, you will no longer be around to contribute towards papers based on it. If you are going to work in an area where academic publications are not really valued, think about these potential conflicts of interest when discussing your plans for publications and thesis writing with your supervisors.

> Simon was a PhD student in Prof. Schmidt's lab. He had received a scholarship from the university for four years. However, after two-and-a-half years, he felt that he had carried out enough experimental work to get a PhD, and suggested to his supervisor that he conclude his experiments and work full-time on writing up the thesis. His supervisor disagreed, and suggested that he begin another set of experiments that would take another year of work. Simon began to feel that he was being treated as 'a pair of hands' in the lab, and that Prof. Schmidt was more interested in getting results than helping him to get his PhD quickly. He took this issue to the Director of Graduate Studies for his department, who looked carefully at the work in consultation with a colleague who was also an expert in the area of the thesis; they concluded that the experimental work was sufficient. The issue was resolved by the Director of Graduate Studies having a quiet word with the supervisor, encouraging him to see his role as one of supporting the student in getting a PhD, not maximizing the amount of experimental work he could get the student to do; this encouragement was backed up by a promise that he could transfer the fourth year of funds to support a new student.

Another form of work that is often taken on by PhD students is teaching within the university. This could be teaching undergraduate seminars, demonstrating in a laboratory, or marking students' work. This is a valuable source of income for many students, as it is paid well relative to other forms of part-time work. You may alternatively be required to contribute a certain number of hours to teaching as part of a graduate teaching assistant position that is funding your PhD. This can, however, be a significant

distraction from your PhD research. One tip is to take on multiple classes from the same module; this might be less interesting, but it cuts down on preparation time. You should also take care not to put in an excess of time outside your paid responsibilities. For example, if students email you outside of class time, you should not be afraid to reply saying that you will answer their question during the next class session.

Mature students

The majority of PhD students (77%) in UK universities are aged over 25, with 43% being 30 years or older (hesa.ac.uk). As a result, you are much more likely than the typical undergraduate to have additional responsibilities, such as juggling your PhD work with caring for children, elderly relatives, etc.

Furthermore, your supervisor may be younger than you. If this is the case, you need to recognize that despite their relatively young age, they have substantial experience and qualifications in supervising PhDs. If you are not careful, you can develop resistance towards accepting guidance from a younger supervisor. As a mature student, you have to make a particular effort to meet the supervisor as one adult to another.

You may also suffer from ageist perceptions based on out-dated notions of 'mature students' and their ability to cope with the rigours of study. This can cut both ways: you might have to dispel myths that you are less mentally agile, or have an out-of-date view of the subject; on the other hand, people may assume that because of your age you are more organized and able to cope more easily with difficulties. It can be important to remind your supervisor that, whilst you may have many years of life experience, you are coming to PhD studies for the first time, and that you will not automatically be competent in all areas.

Many universities will have a group specifically for mature students. It is worth joining such a group, or starting one if need be. Even if you are the only older student in your department, there is a lot of value to be gained by sharing and comparing your experience with students in other subjects. As part of this group, you can talk about any difficulties you may be having and discover whether these are experienced by mature students in general. As well as comparing experiences, you can also begin to brainstorm ideas for presenting your problems to traditional students and to your own supervisors where necessary. Furthermore, such a group can work with the student union to campaign for better recognition of mature students within the university.

Despite these issues, students of all ages manage to complete PhDs successfully. We know of one recently successful student, Dr Pessy Krausz, a great-grandmother three times over. As we go up the generational scale, it is exciting to have such role models even though there are those who consider

that someone with so many generations of family below her should be safely at home knitting for the new arrivals.

DSP was particularly proud to have been the supervisor of Dr Edward Brech, who was in the *Guinness Book of Records* as the then oldest British recipient of a PhD degree at the age of 85. The UK record is now held by a woman who was awarded the PhD degree at the age of 93. Dr Brech himself went on to gain the DLitt (a higher doctorate) when he was 97. We expect breaking age and generational barriers of this kind will become more common in the future.

Working in the British cultural environment

You may be coming to the UK for the first time for your PhD studies. So, in addition to starting research and adapting to the academic work environment, you may also have to adapt to the broader British cultural and educational context.

You might find an added difficulty in beginning your research work because of the problems of settling into the country. You may feel excluded by home students who cannot put themselves in your position sufficiently to realize that the small things they take for granted, such as shopping or going to the launderette, can be major obstacles for you. It makes sense for you to anticipate these problems and find out as much as possible about Britain and the British postgraduate educational system before coming, as well as during your early period here.

Students, newly arrived in this country, may be subjected to a certain amount of social isolation unless they make an effort to meet people. You may have left friends and family behind and everyday practices which until now have been taken for granted, such as eating a family meal or talking things over with a close and trusted friend, are no longer possible. You may miss talking in your first language. All of these can lead to isolation and homesickness.

An important way of tackling problems such as these is to join university societies where people from your home country meet together. This helps to minimize the shock of accommodating yourself to the differences in culture. Getting to know non-university compatriots for social activities, particularly if they are not to be found at the university, is also helpful. Nonetheless, it is important to balance this with getting to know a wide range of students. University provides an unparalleled opportunity not just to meet British students but people from around the world, and it would be a pity if you passed up this opportunity by spending all of your free time with people from your home country. Hickson and Pugh (2001) discuss related issues of culture clashes experienced by expatriate managers around the world, but the same problems are faced by research students studying in a new country.

Overall, you need to realize that it takes a significant amount of time for any new doctoral student to settle in and begin useful research work. Because of these additional difficulties, you must not become impatient if it takes a little longer for you.

For international students from many countries, the self-starting nature of the British postgraduate educational process may present particular problems. Such students expect major contributions from their supervisors towards the research and writing of the thesis. You may come from an educational system that is built on the view that knowledge and wisdom come from the ancients; that the older a source is, the more senior in status a person is, the more valued their pronouncements are held to be. You do not argue with your father, your guru, your professor; that would be showing disrespect. You are here to learn from your supervisors by doing what you are told. If you come from a culture that accords deferential respect to elders, seniors, teachers, you will be more used to waiting to be told what to do before starting on a task. At the very least, you will expect to get approval for your idea before working on it.

If you do hold such a view, you will have to work very hard to understand the nature of the new culture you are entering. First, it is a scientific and academic culture that values newness and change. Everybody is striving for new conceptions, new analyses, new results that give more knowledge, more understanding, more insight, more control. Older approaches are superseded and become of historical interest only. Newton is still regarded by many as the greatest physicist who ever lived, but we no longer study his works in modern physics. We do not regard it as a paradox that we know more about the English Civil War than historians did a century ago.

Second, it is a culture in which you are being prepared to play your role as a partner in this process. You are being helped to think for yourself, take initiatives, argue with your seniors, and so on, in order to demonstrate that you have something to contribute to the continually changing academic debate. Third, to help you with this, you will be left to your own devices for much of the time and this is regarded as an opportunity, not as a deficiency.

If you are unable to conquer it, this cultural difference will become extremely debilitating by the time you get to the end of your period of research and it is time for your oral examination, when you will be expected to provide an assertive and confident defence of the thesis. Sometimes, students from cultures where they were taught to be respectful to those in authority find it far more difficult to engage in any real argument with an examiner. The examiner will have a high status and likely be older than the candidate, thus making a discussion between equals almost impossible for some non-western international students.

If possible, spend some time attending seminars as an observer, and then as a participant, in order to familiarize yourself with how this non-deferential activity is an accepted part of the academic process. You may also find that

attending a course on assertiveness skills will help you to get to the point where you feel confident enough to participate in the academic process. Maybe you could join, or set up if necessary, a support network of both new and experienced international students.

Some male international students find it difficult to defer to a female supervisor because, in their home country, men have a higher status than women in the professional sphere. One female supervisor, Dr Marlow, recounted her experience with Mohammed, a new student. In addition to not accepting either work or comments from her, he simply refused to acknowledge that she was his supervisor. Eventually, she arranged for her male colleague in the next office to act as intermediary. The male colleague agreed to accept any work handed over by Mohammed, which he passed to Dr Marlow. Any comments were then relayed to Mohammed who believed that the suggestions were those of Dr Marlowe's colleague. Although this was not sustainable, it does illustrate the sorts of difficulties that can be encountered when people from diverse cultures are suddenly thrown together without any preparation.

If women are held in less regard than men in your home country, you ought to understand that there are many countries, including the UK, where women are not only treated as equals but can achieve the highest office. Outside of Europe, for example, women have held the highest political position in Pakistan, Bangladesh, Turkey, Israel, India, Sri Lanka, Myanmar, and Guyana. In all of these cases, the women had to work together with their male colleagues in government as they climbed the political ladder. Throughout their professional journey, and even after they had achieved their goal, these women had to demonstrate they were competent to lead from the front.

Less serious, but still a problem, is the attitude of some students to using the first names of their supervisors and, to a lesser extent, being referred to themselves in what they perceive as a familiar or disrespectful manner. The difficulty of what to call each other is also experienced by supervisors who are sometimes unsure which of two names is the given – as opposed to the family – name of one of their students. This is because in countries such as Japan, for example, the family name is the first in order and in some West African countries both names sound so unusual to British ears that either one could be the given or family name. The result of all this confusion is that sometimes a member of staff will call a student from a non-English-speaking background by his or her family name as though it were their given name and the student may never pluck up the courage to correct them.

By now you should have come to terms with the fact that there is going to be a certain amount of culture shock – the realization that accepted ways of behaving vary by culture. For example, the famous English reserve can be discomfiting when you first encounter it.

Working in a foreign language

Around 40% of PhD students in the UK come from overseas. Some will be from English-speaking countries, while others will be working in an English-speaking environment for the first time. Even if you are fluent in reading and writing in English, you may feel that you have lost part of your personality by having to express yourself in English all the time. Because of the funding situation, international students are often accepted into a research degree course without being given a clear idea of the standard of written English that is required for the thesis. This could have extremely unfortunate repercussions if you are such a student, so you must ensure that you make it your business to be aware of precisely what is needed for a thesis to be written to the required standard. Reading accepted PhD theses will aid your proficiency in English, and you should start this task at an early stage of your study period. Furthermore, writing in *academic* English is different to other forms of writing, and advice given about writing in general is not always applicable to academic writing (see Chapter 7).

Spoken English can also be a problem. For example, one student explained that when he was told to 'read around the field', he was very confused and did not know where to go: 'What field? Where should I read?' Always ask for clarification by repeating, in your own words, what you have understood. Remember that English is a complex language with words that have many different origins, and words with multiple meanings. If a word (such as 'field') doesn't make sense, use a dictionary to determine if it has more than one meaning.

Even students from countries where their first language is English (e.g. America, Australia, Canada, and South Africa) are confused by the different ways in which words such as, say, trunk, pants, and bum are used in the UK. We have 'terms' rather than 'semesters' and, as we explain on page 56, depending on where you are from the terms 'thesis' and 'dissertation' mean different things when referring to levels of education.

As well as the obvious point that ultimately the doctorate is awarded for a *written* thesis, writing is also important in the organization of practical work and in the conceptualization of the argument that links the different parts of the work together. The problem is exacerbated by the considerable discrepancy between the English demanded for academic writing and the everyday spoken English you will encounter. We cannot emphasize too strongly the need to express ideas and concepts in academic English. So, as a student from a non-English-speaking background, you need to do something about improving your command of the English language and its grammar from the start. Most universities provide help in this regard. It is important for this to be arranged early on and not left until the research work is almost completed. It is a sensible investment which will have payoffs in the rest of your career, as English has become the international scientific and academic language. Dictionaries – whether those that translate

from English to your home language, or those that give definitions of words – are valuable tools and are readily available online. Most universities will make online versions of comprehensive dictionaries such as the *Oxford English Dictionary* freely available to their students.

One result of inadequate written English, especially on the part of good students, is that conscientious supervisors become involved in a moral conflict concerning how far they should intervene in the writing process. As their students come to the end of their period of registration and residence in Britain, supervisors feel increasing pressure to ensure their students' success by writing parts of the thesis themselves. This is unacceptable for a variety of reasons, not least because potential employers are entitled to assume that a successful British PhD candidate can write acceptable English. Similarly, some students will use proofreading services to improve the English in their theses. On the whole, as explained in Chapter 8, we would discourage this. One of the things that a PhD certifies is that you are fluent at writing in academic English appropriate to your discipline. Furthermore, this could prove embarrassing if a part of the thesis has been rewritten by another in a way that you no longer understand – and, more than embarrassing if this means that the examiners cast doubt on the authenticity of the work in the viva.

Role models, mentors, and support groups

We learn a lot about the PhD process through our interactions with other people. We can formalize this by observing and interacting with specific people who have relevant experience. This can include learning from role models, taking part in mentoring and buddying schemes, and getting involved with support groups.

Role models

Many students find it useful to have role models, people that can be a source of inspiration. You can look to a role model to reassure yourself that you can, with determination and commitment, achieve your ambitions. A role model can also give you a framework for you to emulate. By looking to someone who began in a similar position as yourself, you can see what steps they took, and model your own progress on theirs.

Role models might be successful people in your field, who you can find out about through autobiographies or documentaries. They might, however, be fellow PhD students in your own university, just a year or two ahead of you. Talking to such students can provide reassurance and ways of getting through difficult times in your PhD journey. We discuss below how to meet such students through networking groups and mentoring schemes.

For some students, it is important to have a role model who reflects aspects of their identity. For example, Veronica had two supervisors, one man and one woman, and it was important to her to have this connection to a woman:

> It's different talking to a woman supervisor than a man. There's more of a bond between women. If something personal was disturbing me, I wouldn't be able to talk to my male supervisor but I do to my female supervisor.

Irene, another female student, said:

> There's only one woman on the staff, she was definitely a role model for me and my protection from the male–female power relationship. Without her I'd never have stayed.

In some disciplines, the paucity of successful academic role models for women puts them at a disadvantage compared with their male peers, since it is more difficult to develop an appropriate self-image. Furthermore, it allows prejudice to be manifested. Yvonne, an economist, explained: 'There are some blatant and self-proclaiming misogynists in the department'. Another student in the same department, Shula, revealed a specific experience she had had at the time of upgrading to full PhD status:

> My main supervisor was happy with what I had written but I met with considerable hostility from an anti-feminist man who wrote two pages of personal vitriol and destroyed any confidence I had. My supervisor tackled the committee about his abuse of power.

Her upgrading was then agreed despite the attack on her work.

In recent years, gender equity has become a focus through the national Athena SWAN scheme (https://www.advance-he.ac.uk/equality-charters/athena-swan-charter). The scheme gives awards to universities based on current gender equity, planning improvements, carrying out those plans, and, for the highest award, demonstrating leadership and inspiration to others. This has encouraged many departments to put in place specific measures to support gender minorities in their subject, and to ensure there is an ongoing working group to discuss these issues and promote improvements. If this is an area of importance to you, volunteers are always welcome to join the local Athena SWAN group, details of which can be found at the link above.

If you are from an ethnic minority background, you might also want a role model from your own ethnic group. Winston, an African-Caribbean student educated in the UK, spoke of the lack of role models for disadvantaged

groups. He said that one of his main reasons for wanting the doctorate was to demonstrate to other black students that it was possible to get a PhD.

Carina, a black student researching minority cultures, told of difficulties in gaining entry to a university department at research degree level. She described becoming a research student as a closed shop, and repeatedly spoke of exclusion and exclusivity. Carina said that when talking to potential supervisors she had been told: 'Black research on minority cultures is biased, and therefore whites do it better', and 'It has all been done already; we know everything there is to know about the black minority in this country'.

She explained that, as an act of self-preservation, students from ethnic minority groups select the institutions to which they will apply very carefully indeed. They have to know the university and the attitude of its academic staff very well before they will even consider applying. She also reported that she and her non-white friends had got used to being subjected continuously to administrative bureaucracy, such as being asked for identification whenever they wished to go to the library, whereas white students were allowed in on the nod.

Again, a national scheme, the Race Equality Charter (https://www.advance-he.ac.uk/equality-charters/race-equality-charter) is being adopted by an increasing number of universities. The aim of this is to give to universities a structure for addressing issues around racial equality.

Mentors and buddies

Another form of support is provided by mentoring and buddying schemes. In such schemes, students pair up or form small groups to learn from one another's experiences. In a mentor scheme, a less experienced student is paired with someone with more experience. In contrast, a buddying scheme will pair students who are at a similar level. Sometimes, groups are made up of students from a particular minority group drawn from across the university.

Such schemes can be valuable ways of meeting people and sharing ideas. Never put off having a mentor/buddy meeting until someone has a specific issue to raise; there will always be something to discuss.

Support groups

Another source of support can be through peer support groups, often organized through the student union. Most universities will have women's groups, groups for ethnic minority students, mature students, overseas students, and LGBT+ students. In some larger universities, groupings may be more specific (e.g. 'women in engineering'). Furthermore, there may be groups to provide peer support for students with dyslexia or autism.

In the current climate of changing relationships between the sexes, it is being recognized that male *as well as* female students experience relationship problems at university. Hence, on many campuses, 'men's groups' are springing up to explore the meaning of masculinity. All-male groups provide the context in which to explore feelings and address what members can do to modify their behaviour without absenting themselves from academic arguments. These groups have a particularly important role to play in mental health.

There is a great deal of conflicting information about what being a man means and confusion concerning how to be a 'good' man. Should men be sensitive and all-caring, or should they be hard and take no nonsense? We raise this issue in recognition of the number of young men at Oxford University under the age of 25 who commit suicide (Hawton et al., 2012). Self-improvement among women is a common theme and whereas women's magazines, for example, are bursting with advice, there is little for men.

A recent, and welcome, trend is the emergence of groups for students from a working-class background and/or who have no family experience of going to university. If you are from such a background, you can easily miss out on tacit knowledge passed on by family members. These groups provide an opportunity to reflect on these issues, both as a means to negotiate the complexities of the university system and to lobby the university for better information for students. Indeed, we hope that one of the roles that this book will play will be to demystify the PhD process and make it accessible to students from a wide range of backgrounds.

Reducing stress and staying healthy

Maintaining your physical and mental health is as important as your PhD studies. Some people enter university in full health, others with the disadvantage of an ongoing health condition. With the right support, everyone should be able to succeed. Anxiety is experienced by most students at some time, and if you don't take care of your health from the very beginning, then stress could become a major issue.

It is important to find time for yourself outside of your PhD. This should include activities and exercise that are focused on the physical rather than the mental, as well as a week structured to allow plenty of time for rest. As an alternative to exercise, activities such as cooking or playing a musical instrument can provide a welcome distraction from the rigours of your studies.

One difficulty with research is that thinking about your subject can be unending. Trying to detach from this, whether by finding time for yourself or engaging in social activities with people away from the university, is important. Not only does this provide a much needed break from your

work, but it also gives your ideas time to settle and for you to return to your studies with a fresh perspective. Whilst occasionally – the run up to a conference deadline, carrying out a complex experiment – you might be required to burn the midnight oil, it is our firm belief that a PhD should be readily achievable within a 40-hour working week.

Not all sources of stress can be alleviated by the distractions of exercise or rest. In some cases, there may be structural issues or dysfunctional supervisory or workplace relationships that go beyond day-to-day stresses and strains. This is discussed further in the section about exploitation below (p. 178), as well as in the section on stress in the previous chapter (p. 147)

One source of relief from the stresses of PhD life is having a discussion with fellow students, whether within your department, across your university, or more widely through online forums and social media. Such support can be invaluable in giving you a wider perspective on your progress and problems, as well as providing an outlet for those frustrations that only other PhD students can understand.

Furthermore, social media can provide a forum for discussing topics that are rarely discussed within university, such as careers outside of academia, or weighing up whether or not to leave a PhD programme. You should be wary, though, of being caught up in unproductive, cynical discussions, as social media can be an outlet for the disaffected with too much time on their hands.

You may have, or develop, a longer-term health condition or disability during your PhD studies. Disabilities involving problems with vision or mobility are difficult to disguise but illnesses such as diabetes or epilepsy, for example, are not often obvious to outsiders and it is up to you, the individual, to decide whether or not to declare such a condition.

Autism is now more commonly seen as one of many 'neurodiverse' styles of thinking, rather than being regarded as a disability. Universities are increasing awareness of this through staff training, and by making adaptations to processes that recognize the neurodiversity of the student body. Richard Brownless, who studied mathematics at Oxford University, said: 'My very literal, logical and systematic thought processes were instrumental in helping me succeed in my course' (Grubb, 2013). Similarly, dyslexic students can achieve excellent results given the appropriate level of help and support.

Many universities have a number of disabled, neurodivergent or dyslexic people on their academic staff who, if you seek them out, may well offer help and advice, though you should be aware of the many other pressures on their time. If you are British, explore the possibility of your entitlement to the Post Graduate Disabled Students Allowance (www.gov.uk/disabled-students-allowances-dsas), which includes support for students with a wide range of physical and mental health conditions.

The university is legally obliged to make 'reasonable adjustments' (Equality Act 2010), and in most universities this is coordinated by a central wellbeing or disability office. Importantly, your university should support you if you want to continue to work on your PhD while having a longer-term condition. Some universities will, unfortunately, take the attitude that the only possible mitigation is to interrupt your studies until you are 'recovered' sufficiently to proceed. This might be appropriate for some students but not for others, in that 'recovery' can be a complex phenomenon: you may, for example, be able to study well for a few days, then be incapacitated for a period.

Regardless of your initial health, a work routine is important for all students – as is eating regularly, establishing a good sleep pattern and ensuring you take any necessary medication. Universities should adapt to these situations, and supervisors should be trained and supported to help all students to successful completion, regardless of any specific health condition.

When things go wrong

We hope that the vast majority of you will sail through your PhD without any major problems. As we have emphasized throughout the book, a PhD is a complex process, and all students will experience ups and downs. What, however, do you do when problems go beyond these day-to-day vicissitudes? What mechanisms exist to help when you have major problems.

Harassment, abuse, discrimination, and bullying

Universities typically have a strong set of institutional policies and practices designed to avoid the worst excesses of power: harassment, abuse, discrimination, and bullying. Despite these mechanisms, these abhorrent practices still occur. PhD students are in a particularly vulnerable position because, compared with most others in the university, responsibility for their work, progress, and welfare rests in the hands of a small number of people, sometimes a single supervisor. This is why we strongly recommend that universities adopt a supervisory panel system, which as well as providing a diversity of academic input into your PhD, also avoids the 'single point of failure' when a supervisory relationship turns sour.

Beyond these issues of broken and abusive supervisory relationships are outright problems of sexual and racial harassment or discrimination based on sexuality or transgender status. Although universities ought to be free of such prejudices, sadly, incidents do occur and so it is important to understand what to do if you are a victim.

If you do find yourself the target of prejudice, there are a number of approaches available to you. A good starting point is to take advice from a neutral third party such as the student union, also known as the guild or association in some universities. They will have a student advice/support centre, even a dedicated postgraduate advisor.

Importantly, the union is a separate organization from the university, and so you can talk to a union advisor without any fear that your concerns will get back to the person causing the problem. Societies for women, LGBT+ students, overseas students, and mature students will also be affiliated to the union. These have a social role, but are also places where you can talk to students who may have experienced similar problems to yourself.

After taking advice, what should you then do? The first thing is to keep a careful record of any incidents that occur; then you need to raise the issue. You may be able to do this directly with the person who is causing the problem, perhaps accompanied by a student union advisor. In most cases, however, it is better to approach the director of graduate studies or head of department. If the person who is causing you the problem is themselves in a responsible position – directors of graduate studies and heads of department might also be PhD supervisors – then the student union should be able to advise you about the appropriate procedures.

It is important that you decide the outcome you want. These include:

- The individual should refrain from the problematic behaviour – and a responsible person such as their line manager should ensure that they do so.
- A change in circumstances: moving to another supervisor, not being asked to share an office or lab with the person who is causing the problem, for example.
- An apology from the offending individual.
- Re-examination of a piece of work, if you feel that your work was undervalued, say, because of discriminatory behaviour.
- Financial compensation, whether as compensation for distress caused, or in the form of a tuition fee or living expenses paid to compensate for time lost because of the unacceptable behaviour.
- A formal reprimand for the person involved.
- Wider awareness raising or training within the department or university in order to prevent the behaviour occurring in the future.

In most universities, an informal attempt to resolve the issue is the first stage of a complaint process. If the issue is unable to be resolved, then you can ask for the complaint to be investigated formally, first within your department, and if that is not sufficient, by a senior member of the university outside your department. The individual conducting the investigation

will usually ask you and other relevant people, including the person causing the problem, to provide their account of it (in writing and/or through discussion) and to provide any other evidence (for example, you might have emails that show evidence of abusive language or bullying). After this, they will produce a written report.

If you are not content with the results of this investigation, you can take your complaint beyond the university. In the UK, such complaints are handled by the Office of the Independent Adjudicator (https://www.oiahe.org.uk).

It may be that your concern is with a larger-scale, more systematic problem that you and your fellow students have observed. Again, the student union, and student course representatives, are good starting points for such larger-scale concerns, as they can coordinate a campaign for change, as has happened recently in many universities with projects to decolonize the curriculum. Again, the focus of a successful campaign should be on the outcome that you want to see – how you want the university to be different.

Things are more difficult when you observe a problem that doesn't affect you directly. Some people prefer to deal with problems in their own way, and don't appreciate others' help, however well-intentioned that may be. You should either talk to the person who appears to be the victim before escalating, or discuss the situation with a senior person in your department without revealing the persons involved. Some universities will offer *bystander training* courses to help you decide what to do in these situations.

What should you do if you find out that your supervisor, or a colleague in your laboratory, has been inventing data, or plagiarizing work? There is a clear moral duty here to expose this (so-called *whistleblowing*), but there is a danger that you will not be believed, and your own career might be damaged. Increasingly, universities will have a process for flagging up such concerns, including the ability to approach someone to talk through the issue before taking it further.

Exploitation

More than anything, universities are collections of people with a broadly common purpose. Everyone, including PhD students, is expected to pull together on tasks such as helping the wider public to understand your subject; organizing research seminars and conferences; and volunteering at events to help recruit new students. In a laboratory discipline, everyone in the group might be expected to help with tidying and organizing the lab at the end of each week. Not everything that you are expected to do can be spelled out in detail at the start of your studies, and not every activity will be compensated for financially.

Nonetheless, there is a point where this tips over from reasonable communal effort into exploitation. At the most extreme, you should not, of course, be expected to do tasks irrelevant to the work of the university. You

are not your supervisor's lackey, and should not be expected to do their shopping or provide childcare for their families. Clearly, anything like this is unacceptable and you should raise it with the director of graduate studies or head of department immediately.

Similarly, you should not be expected to spend your own money in support of this wider purpose. We have heard of cases where everyone in a research group, including PhD students, was expected to take a turn in providing cakes for a research seminar. To expect everyone to contribute in such a way is unreasonable.

There is a finer line when it comes to requests that are relevant to your work, but which are disproportionate to the professional benefit that you gain. You are not your supervisor's personal research assistant, and whilst it would be acceptable for them to ask you a few questions about a methodology in which you have become expert, expecting you to carry out an analysis of a dataset that will neither go in your PhD nor which will result in your getting your name on a publication is not acceptable. Alternatively, imagine that one of your supervisors asked you to spend several days carrying out background research to help prepare for a television interview or an appearance before a parliamentary committee. You should be wary of doing such a large amount of work for which you are unlikely to get any credit.

You should also be wary of being asked to teach without payment: volunteering to do a 15-minute talk as part of a lecture where your work is being used as an example is fine; volunteering to do half of your supervisor's lectures, unpaid, whilst they are away at conferences and meetings is unacceptable.

You should, of course, be aware of your own capacity for exploitation. Your research will have been reviewed by the research ethics committee. Nonetheless, there are issues that you should be aware of. If your research involves people giving up their time (e.g. for interviews or focus groups), you should consider whether what you are asking for is reasonable given the compensation that you may be providing. In particular, if you are asking people on low incomes or who rely on hourly pay, is it reasonable to ask them to contribute for free? If you are working with a minority group that you do not belong to, are you doing enough to engage with that group's needs and concerns? Are you sure that you are not over-generalizing the conclusions of your work from one group of people to another, for example assuming that a study of educated university students will apply to the general population?

Personal issues, family, illness, etc.

Over the course of an undertaking as long as a PhD, you will inevitably encounter some difficulties on the way. Minor illness and personal issues

are an unfortunate part of our lives, and you should expect your supervisors to be sympathetic to the disruptions that occur as a result. Some of you, however, may have more significant problems over the course of your studies, such as physical or mental illness, the development of longer term disabilities, significant family and personal problems, bereavements, and problems with finances and residential accommodation.

Universities are accustomed to students having such problems, and so you should not be shy to ask for some adjustment that takes this into account. Universities will typically have a process, called something like *extenuating* or *mitigating circumstances*, to respond to such problems. As we said above about complaints, in these situations too it is good to think about what you would want to happen, preferably before raising the issue with your supervisor or director of graduate studies. The most common adjustments are to allow you additional time, or to take a break, thus extending your period of studies (from a few weeks to several months).

Some universities also have a financial hardship fund, which can provide additional loans or small donations to help students who are in particularly dire circumstances. If you are a student with a funded scholarship, graduate teaching assistant role, or similar, then you should find out what effect extending your studies or taking an intermission will have on your funding.

Increasingly, universities will have a clear policy about maternity and paternity leave for PhD students, including the impact on finances. If this is relevant to you, you should find out through your department or the university graduate school what these policies are.

Conclusion

The overall message of this chapter is that you should take a reflective approach when adapting to the academic workplace. Think carefully about what assumptions concerning work and study you are bringing to your PhD. These assumptions might emanate from your cultural background, your prior studies, or from your experiences in the workplace. Make sure that you articulate and challenge these assumptions. In particular, you need to recognize that PhD success is built on a culture of critique and self-confidence. Being over-respectful to existing theories or structures of authority doesn't lead to the originality needed for a PhD.

Make use of support groups and mentoring/buddying schemes to help you reflect on these assumptions and build a realistic plan for success in your PhD studies. Look to role models not just as sources of inspiration, but as guides for how to plan your progress.

If you encounter bullying, harassment, abuse, discrimination or exploitation, don't face these problems alone. Keep a careful record of what is happening,

and enlist support from senior members of your department and from the students union.

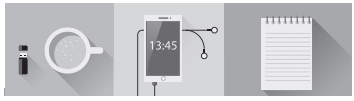
Ensure that you keep in regular contact with supervisors, peers, and your department. Be careful to mark out working time and space in the week, and actively plan how to fit your studies around family and work commitments. These concerns are particularly important if you are a part-time student. You should think proactively about how to remain healthy and avoid excessive stress, by dedicating time in the week to activities that distract you from the complexities of the PhD.

Remember that there are a number of places within the university that can help you with difficulties and to develop as a student. If you cannot resolve issues by talking directly to your supervisor – or, indeed, if it is the supervisor that is the source of your problems – then talking to the post-graduate tutor in your department is a good next step. Remember also that the student union has an important role in supporting you if you have problems; you may be more familiar with the union as a student social organization, but it also has an important support role.

Also, try to be aware of the support that is available before you need it. Universities have a number of mechanisms to help students who have problems that get in the way of their studies. The last thing you want to do when you are ill or disrupted in your life is to start navigating this system. So, get to know what these mechanisms are. Details are typically available on the university website or in your PhD student handbook.

Finally, don't be too hard on yourself about adapting to PhD studies. Being a PhD student is unlike any other activity, and so it will take you a while to adjust to the working patterns and lifestyle. This adaptability and capacity for reflection will be a useful skill for you not just during the PhD, but beyond it.

Chapter 10



The examination system

Action summary

1. You must obtain and study the regulations of the examination system that apply to you.
2. Ensure that you conform to these requirements at the point of submission, during the viva examination, during corrections, and (where relevant) when making an appeal.
3. Use the checklist on page 186 to check that your thesis is ready for submission.
4. Prepare for the viva:
   - by finding out who will be present and as much as you can about how it will be conducted;
   - by reviewing and summarizing your thesis;
   - by ensuring that you have a practice mock viva.
5. Take in to the viva, in addition to a copy of your thesis:
   - your systematic summary;
   - the list of points you wish to discuss;
   - your answers to the examiners' FAQs (see below).

The final examination of the thesis is often one of the most mysterious – and frightening – to students. The aim of this chapter is to give guidance around the final submission and examination of your thesis. Each university will have its own regulations around submission and examination, and it is important that you familiarize yourself with these by looking at them online and attending any meetings that are organized in your university to explain them. In the end, it is your responsibility to ensure that you conform to the regulations that apply in your university.

Giving notice of submission

The examination of your PhD is the summit of the process, coming as it does at the end of years of hard work. You start the whole procedure off by

giving notice, usually at least three months beforehand, that you intend to submit your thesis for examination. The longer the notice you give, the better, as we explain below. Remember that you have to make the decision when to submit your thesis for examination in accordance with your professional understanding, although you will discuss the matter fully with your supervisors. Formally, at most universities, you can submit against your supervisors' advice, although this is very risky. In addition, if the lead supervisor feels strongly that you should not submit yet, this view can be made known to the academic board, who may then decide not to allow you to do so. It is possible to appeal against this decision, but probably more sensible to use your energies to develop your work so that it gets your supervisors' support.

The appointment of examiners

After you have given notice of submission, the formal procedures are set in motion for the appointment of examiners. The examiners' task is to represent the academic peer group into which you are hoping to gain access as a fellow professional researcher. The usual pattern is for an academic in your department other than one of your supervisors to become the internal examiner. The external examiner has to be from another university, usually within the UK.

The responsibility for recommending the names of the examiners to the appropriate university board is that of your supervisors and head of department or research tutor. You might be sounded out to give your reactions as to whom they might be; many supervisors, however, discuss the issue fully with their students.

It is important for you to know who your examiners are going to be before you finish writing your thesis; if your supervisors have not told you this, then you should make a point of asking them whilst you are doing your final write-up. You should expect that they will be academics whose work you are referring to in your thesis. One rule of thumb that supervisors often use in choosing examiners is to give first consideration to the British academic whose work is referenced most frequently in the thesis bibliography. If it turns out that writers quoted in the bibliography are not appropriate, then you must study the works of your examiners, to see where they can be relevantly quoted. Examiners are only human (you are yourself on your way to being one) and they will certainly expect their work to be appropriately cited and discussed, though you should not force references to their work into your thesis inappropriately.

All this takes time and emphasizes the need for forward planning in the appointment of examiners. Senior academics are busy people. The more notice you can give them of when the thesis will be submitted, the less the

gap will be between submission and the oral examination. A month's gap is fine, 2–3 months would be reasonable, but it has to be admitted that gaps of four, five or six months are not uncommon. A gap of over six months is not good practice in our view, but unfortunately it does happen, such as when the first choice examiners are unavailable and they take a long time to tell the supervisor so.

It is good practice for students to commit to a submission date six months ahead; indeed, many universities will have a 'submission review' timetabled into the PhD progress monitoring system around this time. This gives the supervisor long enough to consult with potential external examiners and agree a timeline for the examination, as well as giving you a realistic deadline for completion. Once you have committed to this, it is important that you stick to it. If you miss this deadline, it might cause a long delay to your viva date.

Submitting the thesis

In submitting your thesis there are many rules and regulations to be followed, which vary by institution. There are rules about the language in which it must be written (English – or Welsh at universities in Wales – unless permission has been previously obtained in special circumstances); the size of the pages; the fonts, margins, and layout; and whether it should be submitted as a paper copy or an electronic copy. If a paper copy is needed, there will be additional regulations about whether soft- or hard-bound copies are needed; the quality of paper used; the number of copies you must submit; the colour of the binding; the formatting of the title; and so on. For an electronic copy, there may be rules about the file format and size. You have to be aware of these bureaucratic regulations, although once you know what they are you should not have too much difficulty in conforming to them. Many universities will have a template that you can use to format your thesis correctly.

There are three things to which you should pay particular attention. The first is the final date that is allowable for your submission. From the moment that you are registered as a PhD student, this date has been set and it should be engraved on your mind. (DSP was of the view that it should be engraved on your forehead, so that you see it every time you look in the mirror!) It is normally four years full-time or six years part-time, and it is extremely difficult to get an extension after the due date.

The second requirement is the specified maximum length of your submission. This varies across universities and, indeed, across faculties within a university, so you have to find out pretty early on what is the word limit that applies to you. If your thesis exceeds the set word length, it will simply be returned to you for shortening. It may be possible for you to conform to

the limits by putting parts of your work into an appendix, although many universities are getting wise to this and have set their maximum wordage to include all appendices. You have to check carefully what your university's regulations are. In fact, in most cases, writing more compactly can improve the clarity of the thesis, as the key arguments of the chapter flow more readily. The French mathematician Blaise Pascal wrote, 'I have made this longer than usual because I have not had time to make it shorter' (Pascal, 1658).

The third requirement is that the thesis should be written in appropriate academic English. This is very important, particularly for non-native English speakers. You cannot easily conform to this requirement at the last minute: it must be part of your educational process. You should be getting continuous feedback on the adequacy of your writing throughout your PhD work. As we have recommended throughout this book, an excellent way to get a sense of these more subjective requirements is to read successful PhD theses, many thousands of which are available online through university libraries.

All institutions require the candidate to submit a short abstract, of about 300–500 words, summarizing the work and its findings, in order to orientate the examiners and, later, other readers to the thesis as a whole. You should spend some time on making the abstract cogent, so that it gives a good impression. This is a professional skill that you should develop both for publication and conference papers.

Since, as we have often reiterated, the aim of the PhD is for you to become a fully professional researcher in your field, your examination is not limited to your thesis, although that is the main way in which you demonstrate your competence. In addition to your thesis, you should submit to the examiners, as supporting material, any academic work to full professional standard that you have already published. There are, however, two provisos. First, the papers must be in the academic field in which you are being examined, although they need not be limited to the specific topic of your PhD. (You may be a keen philatelist but papers in that field cannot help you if your PhD is in plasma physics.) Second, they must not have been taken into consideration in the award of any other degree of any institution and you will have to make a declaration to this effect. (You cannot submit in support a published paper based on your master's research project, for example; that would be regarded as double counting.) Jointly authored papers which are relevant may be submitted, and in these cases you have to specify precisely your own individual contribution to each.

Checklist for submission

There are a number of important matters to check, both practical and intellectual, before submission. You should go through the following checklist before you submit your thesis:

- Have you completed all of the formal requirements for submission – completion of your annual review reports, getting approval from your supervisors to submit, etc.?
- Is it obvious where your description of other people's work stops and your own original work starts?
- Does your thesis contain enough material for the examiners to understand both the argument that you are making and the work that you have done?
- Does your thesis demonstrate a command of the research literature in the area of the thesis, and use this material to support the argument of the PhD?
- Is there a good balance of background material, text describing the work done, and evaluative and reflective discussion?
- Is there a clear introduction that summarizes the research questions and the structure of the thesis?
- Is there a clear conclusion that takes evidence from the body of the thesis to show that you have addressed the research questions, and suggests future directions for the work?
- Is the thesis in the correct format?
- Is it within the word limit allowed by your university? Even if it is, does it go into too much or too little detail?
- Have all quotations and experimental/analytical methods been referenced, and is the reference list in a format acceptable to your university?
- Have you submitted any relevant forms such as the intention to submit and any forms about access to the thesis through the library?
- Have you thoroughly proofread the thesis for spelling, grammar, and appropriate academic style and formality for your discipline?

If you have completed all of the above, you are in a good position to submit.

The oral examination – the 'viva'

Some weeks or months (hopefully not too many) after you have submitted your thesis, the oral examination will take place. It is normally referred to as 'the viva' – short for *viva voce*, the Latin for 'living voice'. For the viva, you have to appear in person to justify the contribution that your research has made to the development of your subject before two established professional researchers in your field.

The viva is normally held privately – that is, with only the examiners, the student and, in some universities, a third academic to act as an independent chair being present. The role of this chair is to manage the viva by explaining

the structure of the session, ensuring that the viva proceeds according to the university's regulations, and to ensure that the examination is reasonable and fair. In universities which do not have a system with a chair, the internal examiner takes this role alongside asking questions of their own.

A few universities do, however, allow others to sit in – though not, of course, to take part. If your university allows it, it is a good idea to observe such a viva beforehand. Supervisors may usually attend (in some universities only with the agreement of the candidate) but when they can, they are not allowed to speak.

Since the Covid-19 pandemic, the number of vivas that have taken place by video conferencing (e.g. Zoom or Skype) has increased substantially. If you are asked to do your viva in this way, most of the advice in this chapter will still apply. In particular, remember that it is hard to communicate using body-language online, so you might need to articulate out loud something that would not need to be said face-to-face. For example, if you want to spend a little while reading a paragraph in your thesis, it might be helpful to explicitly say, 'I'm just going to read that passage'. If you are in a more visual discipline that, for example, uses diagrams to communicate, you should think about how you are going to do this. For example, you could familiarize yourself with an online whiteboard program or equip yourself with a document camera, so that you can draw diagrams during the viva. You should also familiarize yourself with any specific regulations that your university has about vivas of this type, for example in terms of technology to be used or steps that the university might take to avoid cheating.

What are the examiners aiming to do at the viva?

The task of the examiners is to establish that by your thesis work and your performance in the viva you have demonstrated that you are a fully professional researcher who should be listened to because you can make a worthwhile contribution to the development of your field. They are going to argue with you, ask you to justify what you have written in your thesis, and probe for what you see as the developments which should flow from your work.

The examiners will have read your thesis and will certainly have formed some views on it, but they will not make the decision on the result until after the viva. This is because they have a number of tasks to perform during the session to which you must contribute.

They have to establish that the thesis is the work of the candidate. They will ask you a number of questions to ascertain this. How did you come to study this topic? Why did you choose this methodology? What were the difficulties of setting up this particular experiment or collecting these particular data? By your mastery of the nuts and bolts of your research project in your answers, you demonstrate that it is your work. More fundamentally,

the examiners will want to ensure that you have not plagiarized work or falsified data.

Your examiners will want to establish that you are a fully professional researcher who knows the field and has carried out a piece of research work using current best practice. They will have formed questions on their reading and will ask you to defend what you have done and what you have written. They will want to test that, as a professional, you understand both the strengths *and* limitations of your work. Whilst you should be 'defending' your thesis, the viva is not a place to be 'defensive' – that is, to treat every question as an attack on the work. Many students make the viva harder than it should be by responding in a defensive way to every question asked by the examiners. You have to show that, as a professional researcher, you are capable of developing by welcoming new relevant ideas.

They will want to assess your knowledge of the field. If important references are missing, why? If you have quoted from a particular paper or book, why that one, and what is its broader contribution to the subject? How has your engagement with the literature informed the work in your thesis? Have you conformed to the norms for carrying out ethically sound research in your area?

They will want to discuss your contribution: what is different, new, original about your work? How will it contribute to the development of research on your topic? Have you demonstrated your contribution using an appropriate methodology? Do you demonstrate logical arguments, and does your work demonstrate appropriate creativity in developing a novel contribution to the subject area?

Although we have separated out the tasks of the examiners to review them, obviously they will evaluate all your answers holistically to form their decisions on your work and your professional standing.

Preparing for the viva

You also need to prepare for the oral examination in an organized way. EMP found that surprisingly few students do any real preparation, even though the benefits seem obvious. Useful introductions to it are given in Murray (2015) and Rugg and Petre (2020). But begin by reading the section on the viva in 'How to examine' in this book (see Chapter 11, pp. 230–34), which provides information on the form that the meeting will take.

There are four key elements that form the basis of your viva preparation:

- preparing your answers to the FAQs (frequently asked questions) that we outline below;
- preparing a systematic summary of your work;
- preparing a list of issues that you want to raise during the viva;
- undertaking practice viva sessions.

First, you need to frame your contribution to the viva by working to ensure that you completely understand and can give succinct answers to the following frequently asked questions:

- What are the major limitations of the previous work on your research topic?
- What is your thesis (i.e. your argument and your position, the answer to your research question)?
- What is your research contribution (i.e. what is new, original about your work)?
- What are the limitations of your research?
- What would you do differently if you were starting out again?
- How do you see research on your topic developing?

If you have the responses to those questions clearly formulated in your mind and can give succinct answers to them, you have taken the first steps in your defence. A succinct answer means two sentences, or three at the most. If you need more than three sentences, it should signal to you that your work may not be as focused as it might be. There is a substantial collection of such questions, across many disciplines, on the *PhD Voice* website (phdvoice.org/viva-question-repository).

Second, you need to develop a systematic summary of your thesis that enables you to identify quickly where a particular issue is found in the work. The following is a tried-and-tested way of developing that summary, while at the same time revising the complete thesis.

Take a maximum of three sheets of feint-ruled A4 paper. Draw a straight vertical line down the centre of each sheet. You now have two sets of about 35 lines, i.e. 70 half-lines. Each half line represents one page of your thesis. Next, number each half-line. One to 35 comprise the left-hand half-lines and 36–70 the right-hand half-lines on the first sheet of paper.

If you are doing this on a word-processing system, you should start by preparing a two-column document. You can then fill in the page numbers in a similar fashion, either by hand or by using a numbered list. You can then proceed in the same way as detailed below, putting a few words next to each number that summarize the main idea on that page. You should then either make sure that the document is on your phone, or print out a copy, so that you have it at hand.

Your next task is to take your time, say about two weeks, to write on every half-line the main idea contained on the corresponding page of your thesis. Here, as an example, is a page of technical description of the methodology from the PhD thesis of EMP (Phillips, 1983):

> It may be observed (Figure 2) that the re-sorted grid is presented with two tree diagrams which display the patterns of responses within the grid.

> These tree diagrams give a visual representation of which elements and which constructs cluster together. In the above grid, construct 1 has been reversed so that what was originally scale point 5 has become scale point 1, scale point 4 becomes scale point 2 and so on, the same is true of construct 3. An example of this is Ewan's two constructs 'Escape/Has to be done' and 'Boring/Interesting for me'. When one of the two is reversed, it becomes clear that 'Boring' and 'Has to be done' are being used in a similar way. Because of this reversibility, complete mismatching between constructs is as significant as complete matching. A negative match between two constructs is a positive match if the poles of one construct are reversed. 'Matching' in this context refers to elements or constructs that are highly related to each other while 'mismatching' refers to constructs that are negatively related to each other. Elements or constructs that bear no similarity to each other are those where the ratings along them form no particular pattern.

> CORE
> The grid technique was also used to monitor change over time for each of the postgraduates as they proceeded through their three year course. In order to do this, consecutive grids from one individual were analysed using the Core program (Shaw 1979). This program analyses two grids, comparing each element and each construct with itself and prints out those constructs and elements that have changed the most in the way the postgraduate is using them.

This was reduced to the following:

> p. 86C reversed; matching and mismatching; CORE intr'd.

The pages before and after this were coded as below so that the whole section read as follows on the half-lines:

> Chapter 4 METHOD – pp. 82–9 sub-section Analysis of Grids
> p. 82 Analysis: refers appendix pp. 289–91; interpretation same
> p. 83 Reasons for Core and Focus
> p. 84 Focus > > > > > 85 diagram of grid
> p. 85 diagram
> p. 86 C reversed; matching and mis-matching; CORE intr'd
> p. 87 Core explained; diagram and eg.
> p. 88 Diff. scores; 40% cut off, clusters and isolates
> p. 89 calculations; FB new info. from re-sorted grids.

At the end of this exercise you will have achieved two important aims. First, you will have revised, in the most detailed way possible, the whole

of your thesis and, second, you will be in a position to pinpoint – at a glance – the precise location of any argument, reference or explanation you wish to use during your viva. Not only will you be able to find your way around your thesis easily but you will probably be able to give a page number to your examiners while they are still thumbing through the document trying to find something that is relevant to the current discussion and they remember having read but can't find at that moment. But you can!

In addition to these obvious advantages, you will be able to do last minute revision from the sheets of paper and not the thesis itself. This means that you can go out, spend time with friends and family, yet still be able to do some work. Your precious sheets of paper are in your handbag or your pocket to be looked at whenever you feel it appropriate or necessary to do so. The mere process of having produced the summary sheets and knowing that you are familiar with them gives you essential self-confidence when you confront your examiners during the actual viva.

This is a general approach and you might wish to develop variations on it. For example, James (French history) used his sheets to make a list in consecutive page order of all the different issues and items supporting them as they arose in his thesis. He was thus in command of where every topic came up. After the viva, James said that this was just as well, as his examiners had read his work carefully, and had a clear grasp of what he was arguing and how he was justifying his position.

Third, you need to create a list of the points *you* wish to see discussed during the viva. The oral examination is, as its name indicates, an examination. It is not, however, like any other examination you have taken. After a regular exam, you might think: 'What a pity. I swotted up on this particular topic, but there was no question on it'. In the viva, if there is something you think is relevant to your research, then you raise it. So you need a list to ensure that all points you wish underline as demonstrating your professional competence in research are raised, if not by the examiners, then by yourself.

Fourth, you need to have practice viva sessions, if you are to perform effectively in them. The toughest event in a viva is an examiner making a criticism of your work that you have never even considered. You then have to think very fast on your feet before answering. Thus an important part of your preparation is for you to find out and consider your response to as many criticisms of your work as possible, *before the viva*. Then you have time to think about a response and so be in a better position on the day. This is one outcome of a practice viva. Another is that the more you practise giving your answers, the more confident and fluent you will become. You can ask one of your supervisors to hold a practice viva with you, and/or arrange with some of your fellow PhD students to help one another by holding a practice viva on each of your theses.

What are you aiming to do at the viva?

Your aim in the viva is to demonstrate that you are a fully professional researcher, who is, on this topic, the equal of your examiners. This might sound like a big ask, and it surely is. But remember, the reward is big too: academic status and a title.

If you have submitted a high-quality thesis with your contributions clearly described, you have already taken the first step in convincing them. Your aim in the viva is to show that you have a rounded knowledge of the field, can contextualize your work in that knowledge, and explain your work in depth. Furthermore, you need to reassure the examiners about any areas of the thesis that are unclear or where there might be errors or omissions. If you have done the preliminary work as we described in the previous section, you should already be in a strong position. Make sure that you take the thesis summary document into the viva, because it is easy to forget the points that you want to make amid the stress of answering questions. In this way, you enter the viva with a list of points about your work and its contribution (my thesis is this, my distinctive contribution is that, etc.). If the examiners do not ask about what you wish to tell them, you raise the topics yourself. That is quite acceptable.

There is no need to give 'politician answers' where you don't answer the question. Instead, you should view the question as a starting point. Answer the direct question, then move on to include one of the points that you want to make that is in broadly the same area. For example, if the examiners ask you a detailed question about the dataset, you should answer their question but then take this as an opportunity to put across your point that you created the dataset yourself, and used an innovative data collection methodology.

The conduct of the viva

There are no rules for the conduct of the viva; it is up to the professional discretion of the examiners. So what happens can vary considerably. Conventions develop though: it can last two, three or four hours but is unlikely to last one or five hours; you might be asked to make a more formal 10–15 minute presentation of your work at the beginning, or not. The examiners may agree between themselves which of them will ask you about different aspects of the research. It is good practice though, however the examiners decide how to proceed, for the structure of the session to be explained to you, so that you have some idea where you are in the process.

It is becoming increasingly common for vivas to begin with a brief presentation by you, the candidate, in which you outline the main contributions of the thesis. This might seem like more work, but it is actually designed to put you at ease, by allowing you a little time at the beginning of the viva when you are in control. Some universities might offer you the option of giving such a talk. We would advise that you take it if offered.

A small number of university departments ask students to give a longer talk to a larger audience – other staff and research students in the department – before the viva.

You should take your time to understand the questions asked by the examiners and how they relate to the thesis. Some questions, particularly at the beginning and end of the viva, will be general questions about the overall thesis. The majority of questions, though, will be about specific parts of the thesis. Many questions will begin, 'on page … you said …'. Take a little time to look at the relevant page in the thesis and skim-read the paragraph the examiner is referring to, rather than diving in and giving a rambling answer. If you do not understand the question, ask for clarification. In the end, both you and the examiner will benefit if you give careful, clear answers to the questions. Also, remember that examiners are not looking to 'trick' you, and nor are you going to fail because of one bad answer.

Here is an example of a viva working in a very good way:

> James was an historian specializing in the history of the French Revolution. When he was waiting to be called for his viva he felt the usual apprehension, but reassured himself that his lead supervisor had told him that he had done an interesting piece of work. During his time as a student, he had been to a number of specialist conferences in modern French history and had heard papers from both his internal and his external examiners, and had asked some questions. They were authorities on the subject from whom he was quoting in his thesis while not completely agreeing with them. He argued that there was one occurrence during the period that they had not fully considered, and that the sources he had examined had thrown important fresh light on this event.
>
> When he entered the room he was delighted to find that they treated him as an equal, immediately plunging in to a discussion of the issues. He felt it was just like being at a conference again and so put his arguments confidently. Having read an earlier edition of this book, James had gone into the viva with a list of topics he wanted to cover, but he found that there was no need; the examiners had raised all the points themselves. The thesis was accepted with minor corrections of footnoting and referencing.

At the other extreme, the situation can be pretty rough, with your being asked critical questions about deficiencies in your work that you have not previously given any thought to. Remember that the discussion is based on your work. The examiners will not decide to give you a tough time just because they got out of bed on the wrong side that morning, but because they see deficiencies in your thesis. Thus, before the viva, you should aim to have heard all possible criticisms of your research from your supervisors and colleagues, so that you can prepare in your mind rebuttals or

justifications for what you did. Hang on to the fact that everybody is on your side, including your critical examiners. They demonstrate this by giving you concrete and detailed suggestions for improvements. You must be sufficiently open-minded to listen to, and make use of, these ideas in your resubmission.

Here is an example of a very difficult viva:

> Harry's subject was industrial marketing strategies. His supervisors considered that his thesis was rather weak, particularly in its attempts to pull the disparate data he had collected together to give a coherent answer to his research question. So much so that his lead supervisor advised him not to submit yet. But Harry was under time constraints, as his scholarship was due to run out and decided to submit in spite of this advice. He had not had time to have any practice at a mock viva and so was disappointed when the examiners at the viva, after pointing out some good parts of the work, focused on its deficiencies. They asked him what he thought he should do now to improve the work, thus giving him a chance to demonstrate his grasp of his subject and of the methodology (a questionnaire survey) that he had used. But he had not given any thought to these questions and he floundered in his on-the-spot attempts to cope with the issues. The examiners then changed tack and began to suggest to him what he might do to strengthen his thesis. But by now Harry was so flustered that he did not give the impression that he understood what they were proposing. After he left, the examiners debated whether he was capable of improving the thesis on resubmission, or whether he should be awarded an MPhil. But they did decide to give him the benefit of the doubt and allow him to resubmit.

Most vivas, of course, are somewhere in between those two extremes. There will be a sensible discussion of the issues that your thesis raises, together with some sharp questions on points where your data, your analysis or your arguments are weak. It can be quite tough because you have got to keep your end up – that is what you get the doctorate for. So you need practice. It is absolutely vital to have had the experience of presenting your work to a professional public beforehand, so that, as we said above, none of the possible criticisms takes you by surprise. This 'public' does not have to be big – a couple of academics in your department who are not going to be your examiners but who have had experience of examining would be ideal. Other PhD students should have helped you along the way, as you helped them, and they make excellent examiners in a mock viva.

Just as you need practice in writing during your study years, if the thesis is to be well written, so you also need practice in public discussion and defence of your work. This is very important, because it is quite appropriate for the examiners to consider, for example, a particular part of your argument

in the thesis to be thin, but to agree that as a result of your discussion in the viva you have justified it acceptably, and thus the thesis will not be referred back for additional written work on this score.

The results of the examination

People who have not thought much about the nature of the PhD examination usually believe that candidates will either cover themselves with glory and obtain the PhD immediately or fail and leave in disgrace. This is not so; those are the two extremes of a whole continuum of possible outcomes, which we can now consider. As always, we are presenting a general framework here: you must find out what the precise categories are used in the regulations of your own university.

- The PhD will be awarded immediately after the viva. This, although rare, is the best outcome and the one to aim for.
- The degree will be awarded, but subject to certain corrections and minor amendments, which usually have to be carried out within one month. This is often called a 'pass with minor corrections'. In effect, the examiners say to you: 'If you quickly carry out these changes, we will count your revised thesis as the first submission and award the degree'. The changes in this case are usually minor: an incorrect calculation that does not affect the argument, incorrect or inadequate referencing on a particular point, an inadequate explanatory diagram, for example. You carry out these modifications to the satisfaction of your internal examiner and gain the degree.
- The examiners say, 'Yes, but …'. They think that your thesis and your defence of it are on the right lines but there are weaknesses that must be remedied, and they therefore refer it for improvements. This is sometimes called a 'referral' or 'major corrections'. They will tell you what the weak spots are, and why, and you will be allowed a certain period – usually between six months and a year – to complete the work and re-present it. Unfortunately, you will have to pay continuing registration fees for that period, or else a re-examination fee; exactly how this works varies from university to university. You will not normally have to take another viva for a referral.
- The examiners say that, while your submission has the makings of an acceptable thesis, there are such gaps and inadequacies in it that it will have to be recast and reworked before it can be resubmitted. This is usually called a 'resubmission'. Again, they will tell you what the weaknesses are, and why, and you will be allowed one year to complete the reworking and resubmission, having to pay continuing registration fees. With a resubmission, the amount of change required means that you will usually have to participate in another oral examination to defend your new work.

The last two results, referral and resubmission, are disappointing, but they are quite common and should by no means be regarded as catastrophic. Students usually need a couple of weeks to scrape themselves off the floor and put themselves together again, but the best strategy then is to get on with the extra work as soon as possible. After all, if you are in this position, you have learned a very great deal from the examination. The examiners will typically specify in very considerable detail what they think is lacking in the work and what should be done about it. Once you get over the emotional frustration, which admittedly can be considerable, you are in a good position to polish off what is required. But don't take too long to get restarted: the emotional blocks can easily cause you to waste the time you have been given. It is a good tactic, both academically and psychologically, to get a paper from your research to be considered in a reputable journal in the intervening period.

Once you have resubmitted and obtained your degree, then of course it doesn't matter – no one will ever know. What matters is what published papers you can get out of the work. You would be surprised at the number of established academics who were referred or who have had to resubmit their theses.

The final outcome could also be:

- The examiners say that the candidate's written thesis was adequate but the defence of it in the viva was not. This is a much less usual result but it underlines the fact that the doctorate is given for professional competence. It is the candidate who passes the degree, not the thesis. If you are in this position, you will be asked to re-present yourself for another viva after a certain time (six months to a year), during which you will have read much more widely in your field and gained a better understanding of the implications of your own research study.
- The examiners consider that the candidate's thesis work has not reached the standard required of a doctorate and they do not see any clear way by which it can be brought up to the required standard. However, the work has achieved the lower standard required of an MPhil, and they can award this degree.
- That a revised version of the thesis will be considered for the MPhil degree after resubmission.

Either of the latter two outcomes is a considerable blow, not just because the PhD was not awarded, but principally because the examiners do not see a way of improving it, so it is unlikely that the candidate will either. It will probably be a result of the candidate (and, we must say, also the supervisors) not understanding the nature of a PhD and how to identify and achieve the appropriate standards. The main thrust of this book is to get you to understand and become skilled at the processes of getting a PhD, so that

you do not end up in this situation. In our experience, most students who are capable of achieving MPhil standard as a consolation prize are capable, in the right circumstances, of obtaining a PhD. In some universities, it is not now permitted – except in extreme circumstances – for examiners to award outcomes after the initial examination; students must be given at least one resubmission attempt.

Finally, the examiners could say that the candidate has not satisfied them, and that the standard is such that resubmission will not be permitted. This is the disaster scenario and, thankfully, is very rare. It can occur only when the supervisors have no conception of what is needed for a PhD, or the student is not prepared to listen and carry out what is required of them. Of course, it should not occur at all, but it does. However, if the supervisory process and research degree system matched up to anything like the standards we have been discussing in this book, it should never happen. If you did not have the ability to carry out professional research, you would have been counselled on this and advised to leave the system long before getting to the submission stage. You avoid the disaster of failure coming as a bolt from the blue by ensuring that you seek out and learn from those who do know what the process requires.

After the viva

Regardless of the outcome, you should plan to take a few days break after the viva. However well prepared you are, it will be a tense experience, and if you have corrections or rewriting to do, you will benefit from having some distance from the immediate emotional intensity of the viva to work on corrections.

If you have minor corrections to complete, these should be clear enough from the examiners' comments to enable you to complete them readily, perhaps with a little advice from your supervisor.

If you have a referral or resubmission, you will need to make a plan for working on the changes. It is a good idea to make a copy of the examiners' comments and break them down into tasks. For the more substantial tasks, think through the steps that you will take in order to do the correction. It is a good idea to discuss this plan with your supervisors before starting on the work.

In some universities, the formal regulations suggest that you will have very little support from your supervisors during the corrections process. This does not reflect common practice. Supervisors want you to succeed, and it is not in their interests to withhold support at this very late stage when you are so close to achieving your goal.

Strangely, the list of corrections given to a resubmission candidate will often be more concise than one given to a referral candidate, despite the

fact that there is more work to do. This is because the corrections required of a resubmission are of a larger and more general kind. Very often, the work required in a resubmission is close to that of the primary research done for the thesis. You might be asked to contrast your work against a body of theory that you did not mention in your original thesis, or to carry out a substantial set of additional experiments or calculations to examine some aspect that you neglected. Alternatively, you might have to re-work the whole of the thesis structurally to make the argument clearer. Again, you should get advice from your supervisors so that you do not go off in the wrong direction.

Occasionally, you might find a correction in the examiners' report that you cannot respond to. For example, the report might ask you to carry out an experiment for which you no longer have the equipment, to ask additional questions of a group of people who are now dispersed and inaccessible, or the requested work might take a disproportionate amount of time relative to the significance of the contribution it makes to the thesis. In this case, you should talk to your supervisors about whether to push back against the correction. For example, rather than making the correction as such, you might add a passage to your thesis explaining how it could be done, but then say that it was not possible because of lack of access to equipment. You should be very sparing in this. It is an acceptable strategy, but you must be scrupulous in doing all of the other corrections to a high standard.

It is important that you keep a record as you work of how you have addressed the corrections. Make a copy of the examiners' comments, and then add to each of them a note of what you have done and the page numbers in the revised thesis of where you have carried these out. This makes checking the corrections easy for the examiners.

Appealing against the examiners' decision

Universities will have appeals procedures, where you can ask that the examiners' decisions are reconsidered. These can also be used for other decisions that affect you, such as a review where you are asked to leave the programme.

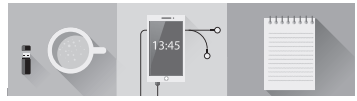
It is important to realize that appeals can only be made on certain grounds, such as an administrative oversight, bias or prejudice by the examiners, or failure to follow procedures. Importantly, these do not include appealing against the academic judgement of examiners. So, for example, it would not be appropriate to appeal because you disagreed with the examiners about a specific correction in your thesis. You could, however, appeal if an examiner had been appointed who did not meet the university's criteria for who is allowed to examine. More subtly, you might appeal on the grounds that the examiners were not appropriately expert in the specific field of your work to make an adequate judgement.

If you want to make such an appeal, you will need to read in detail your university's procedures. You should also take advice from your student union. It is important that you make it clear what resolution you are seeking from the appeals process. For example, you might want your thesis to be re-examined by qualified examiners, a tuition fee refund, or to be allowed to resubmit for a PhD rather than leaving with an MPhil. By making this clear, you focus the minds of the panel and make it more likely that you will get an appropriate decision.

If your appeal is unsuccessful, you can take your appeal further, to the Office of the Independent Adjudicator for Higher Education (OIAHE; oiahe.org.uk). You will need to have completed all of the stages of the appeal process in your university before taking it to them. There is a very useful collection of anonymized decisions on their website, which is useful reading if you are thinking of making an appeal. We advise that you take this route rather than the alternative of taking legal action against the university, as the OIAHE has considerable experience specifically in higher education and is therefore much more likely to be able to resolve your issue appropriately.

For example, compensation has been awarded for inadequate general supervision during the course of the PhD, which led the student to fail or be referred, causing extra expenditure. Compensation has also been awarded when the university, after admitting an international student with a poor standard of English, failed to ensure adequate English language training and support, leading to the thesis being referred. It has also been awarded where a student was not warned early enough that the standard of work being submitted was below that required of a PhD and therefore continued, incurring extra costs, rather than being required to withdraw. Note that these issues incurred financial compensation for university inadequacies, not the academic outcome of the examination.

Chapter **11**



How to supervise and examine

Action summary

1 Be aware that:
   - students have expectations about supervision. Discuss these expectations with them, so that you understand more about your students and can help them to revise any that are inappropriate.
   - you act as a role model for students, and that they will model themselves on your behaviours, not just what you tell them to do.
   - supervision is an educational process and you will have to adopt explicit teaching approaches to provide opportunities for your students to learn how to do research.
2 Take up opportunities for training in supervision and share your experiences with others.
3 Since students can easily become discouraged, a significant part of a supervisor's task is keeping their morale high. It is important to demonstrate that you understand their problems, emotional as well as intellectual.
4 Set up a helpful climate in which there are outline agreements on what the student and the supervisor have to do. If progress is not being made, do not let the position slide. Review the agreements in discussion and renegotiate if necessary.
5 Look for ways of supporting your research students in their academic development.
6 If you are supervising your research or teaching assistant, don't forget to provide PhD supervision in addition to project management.
7 Be aware of issues around discrimination, bullying, abuse, and harassment, know how your university deals with these issues, and take active steps to reduce their occurrence. Learn how to support students who are marginalized or in some way ostracized.
8 Ensure that the allocation of scarce resources such as financial support for conference attendance, or part-time paid research or teaching work, does not discriminate against any group.

9 Prepare for the task of examining by analysing accepted PhDs in your field in order to ascertain what are the current standards of professional research required for the doctorate.
10 Ensure that the oral examination has a clear structure that is communicated to the candidate.

This chapter is principally addressed to supervisors. We consider a series of strategies for improving supervision to help you identify aspects of the role that you may not previously have considered. But this chapter will also give students some insights into the tasks of their partners in this enterprise, thus helping to improve the quality of the relationship on both sides.

In addition to the advice in this chapter, we also encourage you to engage with supervisor development activities in your university. A recent survey noted that only 76% of supervisors were satisfied with their ability to supervise effectively, supporting the need for ongoing networking and development (UKCGE, 2021), which you might find useful to read. Most universities have some kind of supervisory training activities, and less formal events where you can share your experiences with other supervisors. Supervision can be lonely. We don't have much knowledge of it beyond our own experience as supervisors. Therefore, discussing supervision with others can help you to become a better supervisor.

To improve your performance as a supervisor, you must understand what your students expect. Once you have this 'inside information', you will be in a better position to develop the skills necessary to teach the skills of research, maintain a helpful agreement about how your working relationship will function, and encourage your students' academic role development. You will also be in a position, should this prove necessary, to modify students' expectations to make them more appropriate to their particular situation.

What students expect of their supervisors

In a series of interviews, EMP found the following set of expectations to be general among students regardless of discipline.

Students expect to be supervised

This may sound like a truism but it is surprising how widespread is the feeling among research students of not being supervised. Academics, under pressure to research and publish as well as teach, consult, and undertake administrative tasks, may find that doctoral students require too much of

their time. Supervisors may come to regard students as a necessary evil. This is very different from the somewhat idealized conception of supervisors and students engaged in a high level meeting of minds which they enjoy and from which they benefit.

> Julia remained indignant about the limited help she had obtained from her main supervisor, Dr Jacobs, even a year after completion. Whilst he had made detailed comments on her work throughout, he never discussed the overall shape of her study. Therefore, when she submitted, her thesis had two main sections, each taking a different methodological approach. At her viva, the examiners thought that the work was overambitious and that neither section reached the required standard. She had to carry out major corrections, jettisoning one part and significantly expanding the other. Dr Jacobs held the view that if she had been good enough, her thesis would have been able to encompass both approaches without any problems. Julia, however, believed that it was her supervisor's role to provide this expertise in how to structure a research project and thesis, and that he should have given more advice about these large-scale aspects alongside the detailed comments.

This is an extreme case, but such inadequacies of communication between supervisor and student are not unusual. Dr Jacobs should have taken responsibility for ensuring that regular meetings were taking place between himself and Julia. He should also have taken care that these meetings included detailed discussions of the whole project so that he would know whether she was covering adequately the amount of work that they had agreed between them. Most importantly, he should have been supervising her writing by seeing early drafts of the whole thesis. If he had done this systematically, he would never have permitted her to get to the point of a final draft that did not appear to be comprehensive enough in all areas of the work undertaken. Finally, he should have informed his student that it was not likely to pass as it stood. Indeed, in many universities supervisors are required by the academic board to 'sign off a thesis' – that is, certify that it is ready for examination, and Dr Jacobs could have exercised this option if he felt that the thesis was not ready.

More subtly, the feeling of not being well supervised can derive from the fact that students define the concept of 'supervision' quite differently from supervisors. For example, Freddy and Professor Forsdike (industrial chemistry) disagreed about the amount of time spent in supervising Freddy's research. Freddy said: 'He really over-supervises, he's in twice a day to see what results I've got'. But Professor Forsdike insisted: 'We don't meet as often as we should, about once a month only'.

What was happening was that Freddy counted every contact with his supervisor in the laboratory as a meeting, while the professor thought only

of the formal tutorial appointment as contributing to supervision. What is more, Professor Forsdike reported that Freddy had plenty of ideas and that it was very much a shared meeting. This is very different from thinking merely in terms of 'keeping tabs on results', which is how Freddy interpreted his supervisor's role.

In fact, Freddy continued to feel oppressed throughout the three years of his PhD research. He said: 'I feel just another pair of hands for my supervisor. No matter what I do there's always more. I still see him twice a day and he's still on my back trying to get me to do more practical work – but I won't'. However, Professor Forsdike assumed that Freddy needed his support for as long as the postgraduate was prepared to accept it. If the two had talked to each other about it, the situation could have been resolved at a very early stage, instead of continuing, as it did almost to the end of the research period. There are, in fact, two different types of meetings. One type is minor and frequent and part of the continuing relationship. The other type is less frequent and more formal, and needs preparatory work on both sides. The difference in purpose needs to be made explicit.

Students expect supervisors to read their work well in advance

From the student's point of view, it may appear that the supervisor has read only a little of the work submitted – and at the last minute – and wishes to discuss it in the minimum time possible. It is often the case that students' only previous experience of receiving feedback on written work was related to undergraduate essays. They expect comments to be written on the script and to include an overall evaluation. Their idea of a tutorial is to discuss in detail all the points made by the supervisor. But this is not necessarily the best way to set about commenting on work, whether it is a progress report, a description of recent experimental or other research work, or a draft for a section of the thesis.

Most supervisors prefer to focus on specific aspects of students' work and discuss these in detail. This is because they wish to discourage their students from straying too far from a particular line of research. By ignoring the related, but irrelevant, issues raised by research students, they hope to communicate their satisfaction with those areas of concern that should be developed. At the same time, they trust that this strategy will dampen the enthusiasm of those students who are side-tracked into exploring all kinds of interesting ideas, which will not further the progress of the research or the thesis.

However, this way of dealing with written work can lead to considerable bad feeling and a breakdown of communication between students and supervisors. The following illustrates the problem as it was experienced by Adam and Professor Andrews (architecture):

Adam: After seven weeks of writing, he only talked about a very minor aspect of my paper. I realize now that my supervisor is not going to be of any help to me. He doesn't read what I write, so I've realized I'm going to have to get on without him.

Professor Andrews: Each time I choose a single aspect from a paper he has written and suggest that he develops it, I see his work evolving and developing very satisfactorily.

Yet Adam was not at all sure whether he was on the right track and he was unclear about what it was that he was supposed to be doing. It is here that it is essential that communication is clear between the pair. Commenting on work submitted by a postgraduate student means talking around it. The script should form the basis for a discussion. Its function should be to further the student's thinking about the project through an exchange of ideas with the supervisor. The script may be put away and used later as an *aide-mémoire* for the thesis, parts of it may even be included as it stands. But it is not a complete and final piece of work in which every word merits detailed attention. It is the task of supervisors to make clear to their students how they intend to use written work to further the research.

Students expect their supervisors to be available when needed

It is true that the majority of supervisors believe that they are always ready to see any of their students who need them, but there are many who are not quite as available as they believe themselves to be. It is good practice for supervisors regularly to take coffee or lunch with their students – or to buy them a drink (not necessarily alcoholic) – in order to facilitate easy communication.

This can be a particular problem for students who are working with a supervisor who also has a leadership role to fulfil, such as dean or head of department. People in these roles often have their diaries, emails, and phone calls managed by a personal assistant (PA). This can mean that making appointments can be difficult. Even if the PA has been told that research students may make appointments whenever they wish, the postgraduates themselves may find it difficult negotiating their way through this formal channel to ask their supervisor something that might be considered quite trivial. The result of this can be long periods without working and with increasing depression on the part of the student who is afraid of bothering the busy and important academic. On the other hand, this can engender frustration on the part of the supervisor, coupled with doubt about the student's motivation. Even where staff do not have a PA, research students still find it difficult to initiate an unplanned meeting – especially if it means having to knock on a closed door.

Sheila found that if she met her supervisor as they were walking down a corridor, or across the campus, she had difficulty getting beyond the pleasantries. Requesting a tutorial in these circumstances seemed to be inappropriate, in case the supervisor was in a hurry to get to a meeting or give a lecture. There have even been cases where students and supervisors have travelled a few floors together in a lift and the student has still been unable to say there is a problem or that a meeting is needed. Supervisors ought to be sensitive to these difficulties and maintain regular meetings, ensuring that the date of the next meeting is set during the current one. Importantly, students should not be allowed to cancel regular meetings because 'there is nothing to discuss this week/month'. Even a brief meeting provides a good point of focus for the student, and provides an opportunity for students to raise minor issues that do not merit a special appointment.

When supervisors make it clear that they do not welcome impromptu meetings with their students because of the weight of other commitments, many students find it difficult to pluck up enough courage to request a tutorial. This means that a student who gets stuck has to waste time waiting for a meeting arranged by the supervisor.

This is where emails and texts come into their own, as a way to ask quick questions and request longer meetings. Both are useful and unobtrusive ways of maintaining contact. However, neither should take the place of face-to-face contact.

Students expect their supervisors to be friendly, open, and supportive

Supervisors can struggle to strike the right tone when interacting with their students. Although there is a tension between being too relaxed and giving the impression of not caring about the student's work, versus being too formal and critical, both stances can cause students to become discouraged.

Supervisors often feel that if they have established an easy-going, first-name relationship, their students will perceive them to be friendly and open. We discussed the importance of forming this relationship from the beginning of a student's engagement with the university in Chapter 2. However, this is not always straightforward. For example, Charles, who was doing a PhD in astronomy, said:

> It's very difficult to prise things out of Dr Chadwick, so I'm not sure if this meeting today will result in a big step forward for my research. Our meetings are rather silent affairs, as I wait for him to prompt me and he gives very little feedback and only chips in from time to time. I don't get much help, information or encouragement from him. I know that he is my lead supervisor and I don't want to slight him, but I seem to be avoiding him at present.

Here, Charles is expressing dissatisfaction with tutorial meetings to the point of trying to keep out of view of his supervisor. This made life particularly difficult, as their rooms were just along the corridor from each other.

Dr Chadwick, however, still felt that things between them were reasonably satisfactory:

> Our relationship is friendly, even though I never see him outside the formal interview situation. Our meetings are irregular but fairly often, about once every two or three weeks, usually at his initiative. They last up to half an hour but could be as little as 15 minutes. Most of the time we meet to consider details of the computer program he's working on, so he has to explain the nature of the problem and then we discuss it. These programs will be used a lot and so have to be very efficient.

It is clear that Dr Chadwick does make himself available when Charles requests a meeting and takes it as a sign of success that Charles asks to see him. Although Charles avoids using his supervisor's name when talking to him, the fact that Charles raises problems confirms in Dr Chadwick's mind that he is being friendly, open, and supportive. Unfortunately, Dr Chadwick is totally unaware of Charles's inability to talk to him about research matters that are bothering him. An effective supervisor, on the other hand, would not merely stick to academic issues but would create regular opportunities to discuss their relationship.

Students expect their supervisors to be constructively critical

This is a particularly sensitive area. It is the supervisor's job to criticize and provide feedback but the manner in which this information is given is absolutely vital. If the criticism is harsh, or perceived as such by the student, considerable damage may be done. It is important to remember also, that giving praise whenever appropriate is one part, often neglected, of providing feedback. During interviews with people who had achieved their PhDs, there were as many unexpected floods of tears (from both men and women) when this topic came up as there were in interviews with those who had dropped out of their PhDs before completing. Doing a PhD is a very emotional, as well as intellectual, experience for most research students.

Supervisors will be concerned with such questions as: Is the work clearly organized? Is the coverage of the topic comprehensive? How does the information relate to prior work in the area? Are the research methods appropriate and described accurately? Is the discussion clear? Will the work make a significant contribution to the discipline? Does it have policy implications? It is very important indeed that students should have learned how to answer these questions and so evaluate their work without recourse to their supervisors by the time they are ready to submit their theses.

In Chapter 8, we explain how students need to change over the course of their research from depending on their supervisors to evaluate their progress, to relying on their own judgement of the quality of their work. It is essential that in the course of discussions with you, your students gradually become familiar with the criteria against which their work is being measured. As they become better able to mediate for themselves between their efforts and the results, by comparing what has happened with what they expected would happen, they will need to rely less and less on you for feedback. Relying on their own judgement about their work involves confidence, and this will come only from exposure to continual constructive criticism from a supportive and sensitive supervisor.

If students do not receive helpful information of this sort, there is a high probability that they will become discouraged, lose confidence, and decide that they are incapable of ever reaching the standard necessary to do a PhD, which, of course, will affect their future careers. The techniques of giving effective feedback are discussed later in this chapter (see p. 211).

Students expect their supervisors to have a good knowledge of the research area

This is often the reason why a particular supervisor is selected. However, not all of a student's supervisors will necessarily be expert in their area of research. Provided that one of them is, and there is access to other academics familiar with the field, the student ought to be in good hands. It is also of great benefit if the main supervisor's style of work and expectations of the supervisory role coincide with those of the student.

Having access to members of the academic staff other than their supervisors provides students with an additional resource. Between them, these academics will give the expertise required at different points throughout the student's PhD research. These same members of staff can also arrange introductions to specialists from other universities.

While students consider it essential that supervisors should be well versed in the research area, they don't expect them to be experts on their particular research problem. After all, one of the reasons for being awarded the PhD degree is an acceptance that the student has become an expert on that particular issue.

It can also be helpful to have an expert on the process of getting a PhD to call on (perhaps the research tutor) as well as a subject matter expert. There is more to working together than a common interest in an area of research. The relationship between students and supervisors is a dynamic one that is constantly changing. What is important is that communication about the research is clear and there is knowledge on all sides of how the work is progressing.

Students expect their supervisors to structure the tutorial so that it is relatively easy to exchange ideas

Such an expectation would appear, at first, to go without saying, but it is one with which supervisors find it extremely difficult to comply. Creating a comfortable environment in which to discuss ideas and so further the research is not an easy task. We have already seen that there is a discrepancy between students' and supervisors' perceptions of degrees of familiarity and approachableness.

Students expect their supervisors to have the flexibility to understand what it is that they are trying to say. In understanding students, the supervisor needs to be able to draw out their ideas. This is done through a process of continual questioning. Students may speak or write in a complex or convoluted manner for fear of being considered too simple, or they may not yet have managed to clarify their thoughts.

There is no pressure on any supervisor to take a course in telepathy. They may, however, need to learn some simple techniques for eliciting information from people who cannot express themselves coherently.

In addition, students need time without interruption in which to concentrate on the discussion. For this reason, the expectation that their supervisors will have the courtesy not to answer the telephone during a tutorial is not unreasonable, though this has always been greeted with a laugh when put to groups of supervisors. Supervisors may also want to display a 'do not disturb' sign so that people do not knock on the office door during a tutorial. For supervisors who have a shared office or a desk in an open-plan area, it is important to book a meeting room so that the tutorial can take place in a quiet and uninterrupted location. Setting aside a period of time to discuss progress with a research student makes the student feel that they are being taken seriously and conveys the impression that the work under discussion has sufficient merit to be treated with respect. There is nothing more frustrating than to be interrupted in midstream when trying to explain a complex and, as yet, unexpressed idea. Equally, if student and supervisor are engaged in an intense discussion of a specific issue, the line of thinking is difficult to recapture.

If interrupted more than once, the student will likely feel insulted and see their work as having become devalued. Any progress that might have been made in the direction of creating a comfortable environment is sure to be lost.

During tutorials, supervisors should switch off their mobile phones and arrange for telephone calls to be diverted to voice mail. If, for any reason, a call does come through, supervisors should tell the caller that they are engaged in an important meeting and will call back. It is simply bad manners to permit any but the most urgent call to intrude into a meeting that has been arranged and for which work has been prepared. Of course, all this applies to texting too; supervisors should direct their full attention to the student during a tutorial.

In addition, supervisors should encourage their students to participate in academic seminars, particularly those provided especially for research

students. These seminars provide a training ground invaluable for developing thinking through discussion, helping students to structure their ideas into a form that facilitates writing. They also enable students to practise the skills necessary for presenting their work at international conferences. On occasion, supervisors ought to attend such seminars so that their students can see them in the role of seminar participant and leader other than personal tutor. However, if supervisors were to attend every seminar, their students might become inhibited and less likely to speak up. Gradually, seminars should help students to gain the confidence to openly discuss all the aspects of their research with their supervisor in tutorials.

Students expect their supervisors to have sufficient interest in their research to put more information in the student's path

There are a variety of ways in which this can be done. It is important that supervisors take into consideration their students' current need for help. For example, in the beginning it may not be sufficient to suggest a reference, leaving the student to follow it up in the library or online. It is useful, in a tutorial early in the PhD, to demonstrate to students the process of locating relevant articles. That is, the whole process – from using a search engine such as Google Scholar, finding the reference on the publisher's website, logging in using the university library account, and then storing and making a note of the reference in a bibliographic database. This may seem obvious or trivial, but for many students – particularly those who progressed directly from undergraduate to PhD work– this may not be something that they have previously done. Supervisors can also show a student articles and sections of books from their own collections that are relevant to the student at that point in their studies.

Later, conference papers reporting the most recent developments in the field need to be brought to students' attention. At this stage, the student and the supervisor should both be reading the relevant literature and sending journal articles to one another. In fact, the exchange of papers should be seen as an essential aspect of communication and a source of discussion.

Finally, as we have already said, supervisors have a responsibility to introduce their students to others in the field. These specialists should be able to provide information the supervisor cannot. Such contacts are important for budding professionals, enabling them to build up a network within which they can discuss their research interests.

Students expect supervisors to be sufficiently involved in their success to help them get a good job at the end of it all!

It is not a part of your duties as a PhD supervisor to place your student in work, but you may be able to provide advice that is relevant. You may wish

to talk to your students about their career aims and aspirations during the final year of their studies, if not before. This should act as a supplement to the advice given by university careers services. You are in a position to give a realistic assessment of their chances of obtaining an academic post, and explain the factors that universities are looking for when appointing post-doctoral or early-career lecturing staff. It is worth mentioning that sometimes opportunities arise in a neighbouring discipline. In a world where PhD graduates can spend many years in precarious part-time teaching posts, it is worth having an honest conversation about their future career planning.

The majority of PhD graduates will end up in non-academic jobs, and your students should know that you will not view them as failures if they look beyond academia for a career. We give advice to students in Chapter 3 about how they can present their skills in the right way for a variety of careers. Internship schemes can help students understand this too – and help you as a supervisor to make stronger connections with industry or policy-makers. You may also put current students in touch with former students who have taken a similar career pathway. In the UKCGE (2021) survey, 29% of supervisors felt unprepared to provide advice on non-academic careers, emphasizing the important role of others such as university careers services.

Establishing a role model

This is a very important aspect of your task as supervisor. It is not a case of saying 'do as I tell you' but more a case of students gradually learning to 'do as you do'. It is therefore crucial for them to see that research is important to you and that you treat it seriously. By engaging in your own research, and presenting that work at conferences and in refereed journals, you demonstrate behaviour that your students can emulate.

If you are happy to show your work-in-progress, it is beneficial to students to see the various drafts of a paper as you work on it over a period of weeks or months. Maybe they could shadow you for an afternoon whilst you prepare the slides for a conference talk. This gives them an idea of the steps (and mis-steps) involved in preparing a piece of work, and the timescales required. Clearly, it is important to emphasize that this is your way of doing it, and that each student needs to reflect and come up with a way of working that is right for them.

When you postpone a meeting with a research student because of the pressure of other work, such as administration or marking examination scripts, it suggests to the student that those areas of your work take precedence over research supervision. Similarly, if your priorities are orientated to undergraduate lecturing, postgraduates will soon understand that doctoral supervision ranks way down on your long list of responsibilities.

A key factor in doctoral students' development is the observation and internalization of their supervisors' respect for the ethical values that underpin all research. Professional codes of conduct and high standards of integrity are as important to the learning of beginning researchers as how to maintain lab equipment to the appropriate standard or how to design a valid questionnaire. Basic values such as the unacceptability of falsifying results to make them appear more satisfactory, and the need to have the informed consent of the subjects of an experiment, cannot easily be taught in an effective way. They have to be demonstrated by the supervisors in their own research practice. The fact that we now regard plagiarism as 'intellectual property theft' must be communicated, together with the strong sanctions that are imposed on plagiarists who are exposed. Recently, a professor of a British university was found guilty of serious plagiarism in his doctoral thesis presented ten years earlier. First, the university where he had studied withdrew his degree; second, the university where he worked dismissed him for bringing their institution into disrepute. The need to conform to appropriate standards could not have been more starkly demonstrated.

Teaching the skills of research

In general, supervisors are not sure how to teach the skills of research, even though their own research practice may be outstanding. In some cases, they do not even think of supervision as being a part of their teaching role. Yet it is as important to give some thought to the teaching component in supervision as it is to the research component. Important aspects of the teaching task are: giving feedback effectively, developing a structured weaning programme, talking explicitly about your working relationship, and encouraging students' academic role development. These issues are discussed in turn below.

Giving effective feedback

Giving effective feedback is one of the most important parts of your role as a supervisor. We prefer the term 'feedback' to 'criticism' or 'critique', which some students see as wholly negative. Good feedback should consist of a balance of reassuring praise of work well done and constructive criticism to help students improve. If feedback is inadequately done, it will result in one of three unfortunate outcomes:

- bewilderment and depression on the part of the student, who does not understand what is being criticized, but realizes that the work has failed;
- rejection of the criticisms by the student, who becomes defensive and self-justificatory;

- complete acceptance of the criticisms, often with limited understanding of them, which then increases the dependence of the student on the supervisor.

If students do not receive helpful information, it is likely that they will become discouraged, lose confidence, and decide that they are incapable of ever reaching the standard necessary to succeed as a PhD candidate.

There are a number of useful rules of thumb to be followed in enabling feedback to be more effective:

- **Earn the right to include criticism in the feedback.** This may appear a strange rule. Surely a supervisor is entitled to criticize students? Yes, in principle, but in order to avoid the unfortunate outcomes listed above, it is useful for supervisors to remind themselves that they have to establish this right, on a regular basis, as part of the supervisory process.
- **Underline that the purpose of feedback is to make progress.** Establish, and regularly reaffirm, that the doctoral process is a joint enterprise between student and supervisor, and that the point of feedback is to help develop the student's knowledge and skills.
- **Give the good news first.** Demonstrate that you are on the side of the student and that you appreciate what he or she has done. Point out the strengths of the work, and how it has improved compared with the previous submission. This builds student confidence and prepares the way for some constructive criticism. The appreciation must be genuine. It is not effective to say, 'Well, it's an improvement, but …' followed by extensive negative criticism. Reminding students of the strengths of the work at the end of a tutorial can also help to reinforce this message.
- **Maintain a balance between praise and criticism.** A good rule of thumb is to match the number and gravity of the criticisms with an equal number of detailed points in appreciation. If you cannot find a few positive points, you should consider whether you are being unrealistic as to what can be achieved at this stage. Alternatively, consider whether the student needs to be warned that they must improve the quality and standard of their work to avoid failure – and, if this happens several times, that they may be at risk of being asked to leave at their next review.
- **Present criticism impersonally.** Your students should not infer, 'This is your criticism of me'. Start by asking students what they think of their work. This puts them in a frame of mind more conducive to objective criticism. Preface a major critique by saying, 'I'm going to act as devil's advocate here'. Refer to comparable work which the student should emulate.
- **Present feedback related to the current piece of work.** Do not refer back to similar mistakes in previous work, since harping on past inadequacies will affect students' confidence. Only refer to previous work in

order to demonstrate how far the student has improved. So, do not say, 'You obviously have a superficial mind'. Such a comment will only act to dishearten the student, whereas what is needed are examples of how the present work is inadequate and what they must do to improve it. Again, avoid comments on the student's abilities, such as: 'Your English style is execrable. You should do something about it', since all this does is highlight the shortcoming without giving any clues about how or what to improve. If, like EMP, you believe that split infinitives and prepositional endings to sentences are not appropriate to doctoral writing, then examples might be: 'It is not good practice to split infinitives, as you have done on pages a and b', or 'On page x and page y, it is not a good idea to end sentences with a preposition'. You will look for other examples of inappropriate colloquialisms and ungrammatical constructions if, like DSP, you are quite prepared to blatantly split infinitives and think that a preposition is a very useful word to end a sentence with.

- **Present feedback clearly and unambiguously.** You should gauge carefully how much a student can take on board in one meeting. Critical feedback should be as clear and specific as possible, and be related to the level of development of the student. You should be selective in the amount of commentary that you give in one tutorial, so that the student is not overwhelmed. Instead, focus on a specific section of the work or aspect of the project, and let the student know that other elements will be discussed in a future meeting.
- **If you are only commenting on one part of the work, make it clear why.** Perhaps you want to focus on that section for the time being, so that the student is not overwhelmed. Perhaps you are happy with the remainder of the work, and are focusing your feedback on the part that still needs improvement. Whatever your reasons are, it is important to explain them.
- **Pay attention to what your students are saying in response to the feedback you give and then reply to their comments.** Your reaction should demonstrate that you have taken account of what they say in the development of your views. It is important not to be so committed to your own view of the student's work that you are (or appear to be) unwilling to reconsider your views in the light of the student's responses. Always remember that effective feedback is that which is accepted by the recipient as a basis for further work, and you have to demonstrate your ability to accept feedback too.
- **Always end a supervision session by reviewing what points have been made.** This should include the positive ones, and encourage the student to rehearse what now will be done. This 'action replay' is vital to avoid misunderstanding. Make sure that you agree the date and time of the next supervisory session to re-evaluate the work and progress.

Getting your student to do further work should not be left open-ended. Finally, students should be encouraged to write a brief summary of the meeting and, having agreed it with the supervisor, email a copy for the files of the supervisory team.

- **Use a logical framework when presenting feedback.** Apart from being specific about what precisely is wrong with the student's performance, it is also necessary to know what kind of criticism is appropriate at a given point in the student's research career. For example, a detailed critique of grammar and punctuation will not be of very much use if the ideas and general content of a piece of writing are incorrect or confused. You could tell the student that when an unavoidable delay occurs, which prevents the carrying out of an experiment or an interview for example, students should not just stop working. It is necessary to set the wheels in motion to resolve the problem and to continue with some other work such as reading, writing or analysing what has already been done. At the same time, a regular check can be kept on developments relating to the removal of the obstacle.

The student needs to be told all this as well as whether the work should be longer or shorter, contain more references to published work, have less complex sentences, contain simpler ideas or use less jargon. No matter how obvious it may seem to you, it is essential that you spell out to the student, in very precise terms, just what it is that needs to be redone and why. If all of it needs to be reworked, give explicit advice concerning how the new version must differ from the previous one. It is primarily in this way that students can discover what it is they should be watching for in their own work and so become better at judging what is acceptable and appropriate.

The reason for giving feedback effectively is that through it students can eventually learn how to evaluate their own work and so take over this part of the supervisor's job themselves. In the longer term, they have to be taught how to become independent researchers in their own right.

Recognizing students as a whole person

Supervising a candidate for a PhD involves more than just monitoring the research work. Doing a PhD is a very emotional experience, which involves the whole person. As a supervisor, you need to be able to communicate with your students about their abilities and achievements, but you also need to discuss their commitment to the PhD and any external circumstances that affect it. Throughout their registration period, it is highly probable that you will need to take account of their personal lives.

This is true of anybody engaged in supervising another human being, but unfortunately it is too often the case that managers choose to ignore the 'whole person' and patch over, rather than get to the bottom of, any

difficulties that are showing up in the individual's work. While this is true of life at work in general, it is even more true of life within the academic community. As we have already mentioned, academics do have some training opportunities but these do not usually include tuition in interpersonal skills and human relations. So it is important that you understand that research students are emotionally more involved with their studies than are most people at work. Skill in giving effective feedback and eliciting information that may be relevant to poor performance at work is therefore even more important in the supervisor–student relationship than in the manager–subordinate relationship.

What is needed here is interpersonal training in how to state honestly and directly what you as supervisor perceive to be the problem, no matter how upsetting you think this may be for the student. It is far worse for the student to think for a long time that everything is reasonably satisfactory, only to discover at a very late stage that the work is not suitable for writing up, or that the thesis will only be entered for a degree below that of the PhD. Alternatively, the student may be aware that things are not as they should be but will imagine all kinds of causes for the problem, including a sudden and inexplicable antipathy on the part of the supervisor. It is far preferable for the student to have some definite information upon which to base decisions about future behaviour than to worry that something isn't quite right without knowing why.

For example, Charles, studying astronomy, wanted to know whether or not to continue. He said: 'I'd like to if I possibly could, but if Dr Chadwick thought I wasn't capable of it I wouldn't be too upset as long as he told me. Nobody seems to want to advise me'.

Dr Chadwick was disappointed with his student's slow progress and lack of initiative. He said: 'He's probably not very organized in his work, although one would hope there's some wider reading going on'. However, Charles had reported:

> I asked him if he knew of any review articles but he doesn't think there are any. He was busy marking exam papers, so we didn't talk … I still haven't learned how to communicate with Dr Chadwick. There's no rapport between us, none at all. I saw him in the lift accidentally on the last day of last term and all we said was, 'Hello'.

On the other hand, Adam, studying architecture, reported at the very end of his time as a research student:

> My supervisor never gave me any indication of what he thought of me. I decided that he was so bored with what I wrote that he couldn't be bothered to criticize what I did. But really he was hoping that I would be the one to popularize the theories that have been around in his department for some years.

Adam had not enjoyed his years as a research student but was feeling much better as the end came into view and he had some measure of success at an international conference.

Professor Andrews explained how the situation had eventually been clarified: 'We had several discussions about the direction his work was taking'. It is sad that this only happened once Adam had received support for his ideas from others, who actually did consider them to be excellent.

These two examples are typical of the way things can develop when supervisors do not keep students informed of how they see their progress through (a) regular meetings and (b) honest feedback regarding their work.

Introducing a structured 'weaning' programme

You can help research students become progressively more academically independent via a process of weaning. This must include helping postgraduates become aware that they have sufficient knowledge and ability to trust their own judgement and monitor their own performance. This can be achieved by a structured programme that gradually reduces the amount of dependence as the research student gets further into the work. First, you should set short-term goals (and a close date for a tutorial meeting). Later, students can be left to undertake a more complex piece of work over a longer period. A date for reporting progress by a telephone conversation, email, Zoom, Skype, FaceTime or even letter should be set, together with a more distant date for a meeting. If the student has to move from the date originally arranged, an adequate explanation is required. You should also have a very good reason to give your student if you decide to change the original date.

In the final stages, the onus should be more on the student to initiate the contact than it was in the beginning, but you should still be aware of a responsibility to chase up a student who does not seem to be keeping to the agreement.

Later in the process, students must be helped to develop skills of writing and presenting conference papers, journal articles, seminar presentations, thesis chapters or even reports of work undertaken since the last tutorial meeting. Get to this point by encouraging the following activities:

- First, the student prepares a rough draft that sets out 'This is what I think', then corrects and rewrites the draft without referring to you.
- Next, after discussing the first corrected draft with you, the student prepares a second corrected draft that sets out 'This is what I and my supervisor think'. Then the student can again give the draft to you for comment.
- Eventually the student prepares a final draft that states 'This is it', and may keep it as a record. At the end, all well-written records can be used and integrated into the thesis itself.

You should encourage students to set goals that are initially short-term, but which gradually become larger and more abstract as they develop more confidence and ability. Students develop this independence at different rates, so you should adjust your style of supervision to take this into account. You should also remember that students will need closer supervision when they start the final writing up.

One student requiring guidance early on was Greg (ancient history). Dr Green explained that Greg

> usually suggests the meetings, but once last term I was concerned about him and asked to see him. I didn't have to chase him. I just make a passing reference or suggestion and next time I see him he knows the text better than I do. He works extremely well.

Dr Green saw her role as that of guide, not only because Greg was able to work well under his own direction but also because he was fascinated by the information he was accruing about the person he was researching and the times in which he lived. Every bit of additional knowledge served to motivate Greg to explore further. His main request of his supervisor was that she be ready to listen to the results of his latest detective work.

A possible paradigm for a structured weaning process in your overall supervision could be:

- **Early direction.** The supervisor introduces short-term goals, sets the work to be done, and gives detailed feedback to the student at the end of the period.
- **Intermediate weaning.** This phase involves support and guidance rather than direction. The work is discussed with the student, and joint decisions are made about what should be attempted and how long it should take. The supervisor encourages the student to evaluate any work submitted and comments on the evaluation, rather than on the work itself.
- **Later separation.** This phase includes an exchange of ideas: the student decides on the work to be done and its time limits. By now the supervisor should expect a detailed critical analysis of the work from the student without prompting.

The timing of these stages will vary according to how quickly the student develops self-confidence. The main requirement here is that supervisors should recognize the stage that students have reached in their need for support.

Supervisors should consider explaining the stages of the weaning process as they occur, so keeping their students informed. Otherwise, they may become frustrated or even demoralized wondering if they have done something wrong. Supervisors might aim to raise their own level of awareness of students' needs for feedback on their progress. Supervisors

also need to teach students, by example, how academics evaluate the results of their own work and use this evaluation as a basis for revision and improvement.

This might be achieved by discussing with their students how the work they have already done affects their plans for further work. In addition, by making explicit the interaction between what they plan to do and what they have already done, supervisors can teach their students to be more cautious and not to get carried away with overambitious projects. Supervisors who are sensitive to the needs of their students and able to teach them to become self-supervising at their own pace will derive more satisfaction from this part of their work than those supervisors who treat all their students in the same way.

Once students have learned the skills and acquired the confidence necessary to assess their own efforts, their dependence on you as supervisor will begin to be replaced by a sense of self-reliance. It is at this point that they begin to perceive you not as a tutor but as a colleague.

Maintaining a helpful 'psychological agreement'

Cast your mind back to the start of this chapter and you will recall that Freddy did not discuss with his supervisor how to conduct the research or to what extent and how often Professor Forsdike should be kept informed of results. In this case, the professor's behaviour was depressing Freddy and having an adverse effect on his work. They never discussed this problem, and the situation continued without change for most of the time that Freddy was working towards his PhD. Yet it was so easily avoidable; all they had to do was to talk to each other about the context as well as the content of Freddy's work.

A similar lack of communication existed between Adam and Professor Andrews. If Adam had assumed that his supervisor had read the paper (even though privately he believed this not to be the case), he could have asked why Professor Andrews had not bothered to mention more than a small section of it. The conversation would have been opened up enough for the professor to convey his knowledge of the content and express his doubts about the scope of what Adam had done. Such questions from Adam, asked in a positive manner, would have changed their relationship completely. Professor Andrews would have been more expansive in his comments, and Adam would not have spent most of his postgraduate years believing that he was almost totally unsupervised. Of course, if Professor Andrews had put even minimal written comments on the draft, the student would have known that it had been read. Putting a tick at the bottom of each page as you finish reading it will inform your student that nothing has been missed.

It is easy for postgraduates to become discouraged, so a significant part of your job as supervisor is to keep morale at a reasonable level. The process

of learning to do research and becoming a fully professional researcher involves periods of doubt and disillusionment, when it seems that the only thing to do is to give up. There are periods when moods are volatile, and a certain subtlety is needed to help a student through the difficult times.

Do not be taken in by rationalizations no matter how persuasive they may be. It is not helpful to concede that there is 'no need' for a meeting just now or to forgo some evidence of work in progress, because you feel sorry for the student. Of course, you should be supportive when support is needed. But when you discover that there are always new and ever more important reasons why the student should be given more time, you will need to be firm if the student is not to fall by the wayside.

If there is a good reason for a break of several months or even a year, then set it out formally as a break within the institutional framework. This will be more helpful in the long term than building up increasing gaps in work on an informal basis. It is damaging to the agreement between you for the student to live with uncertainty or lack of constraints. Therefore, it is essential that at regular intervals you:

- offer a statement of your expectations, within the teaching relationship that has already been agreed;
- ask your students what their expectations are;
- agree a compromise incorporating any changes.

Handling the situation in this way will ensure that the student doesn't feel the supervisor is either uncaring or lacking control. It would underline the fact that the supervisor and the student are in a partnership.

In order to maintain your verbal agreement at an appropriate level, it is important that you play your role as supervisor in a firm way. If you let your professional judgement be swayed by a fear of seeming to be too tough at a time of difficulty in a research student's career, you will not be providing help at a time when it is most needed. The help you need to provide is to chart a course for the student, avoiding the extremes of, on the one hand, easing the path completely and, on the other, leaving the student to founder, simply so that you might appear more sympathetic. Remember that, given the emotional journey the student is navigating, it is not just your professional expertise the student needs but also your understanding.

Encouraging students' academic role development

Research students should be encouraged to develop more broadly as academics and researchers, beyond merely doing their project and writing it up. In particular, they should learn to present and publish their research, and engage with the wider academic community in their subject beyond their own university. For students who pursue an academic career, this

brings them closer to being a fully professional researcher. It benefits all students too, by rounding out their education and giving them a wider set of experiences that deepen their engagement with their research.

This preparation entails encouraging your students to give seminars on their research and related topics and to attend seminars that others are giving. It means helping them gain the confidence to question and comment on what has been presented by the speaker. Research students should also gain experience of attending conferences, speaking from the floor (as they have learned to do in seminars), and giving papers of their own.

These papers may be of an appropriate standard for publication, in which case you, as the supervisor, must initiate the students into the secrets of getting their work published in reputable journals. In addition, you should encourage them to apply for an appropriate amount of tutoring or demonstrating work, or draw to their attention other opportunities such as summer-school teaching, particularly if they are interested in a future university teaching career.

Giving such support to your students will not take up very much of your time and energy. When there is a conference you want to go to, all you have to do is mention it to them and perhaps sign an official request for help with their expenses. Similarly, inviting them to lunch with you once or twice when you are meeting a friend from another university does not make much of a demand on you, yet it has dividends for the students out of all proportion to the effort required.

Supervising at a distance

There are people who are keen to study for a higher degree by research but cannot attend regularly at university. These include potential students who live in areas with no university; people with disabilities or chronic illnesses; carers; and those with young children who are able to work in their own environment.

The Covid-19 pandemic has demonstrated that research at a distance is increasingly possible. Many libraries and computer facilities can be accessed from home, research seminars viewed online on YouTube or university websites, and tutorials can be carried out using technologies such as Skype or FaceTime. Students who are usually able to attend face-to-face tutorials may sometimes need distance supervision, such as during fieldwork. The survey mentioned above (UKCGE, 2021) also identified a number of issues with online-only supervision. The two most important of these were lack of opportunities for informal meetings, and students finding it difficult to be honest about problems.

Carrying out effective online tutorials requires a different set of skills and practices compared with face-to-face meetings. It can be useful to come to a tutorial with an explicit set of items to be discussed, and be clear

about moving between them. This is because the subtle clues of gesture and body language that people use to navigate through a meeting are less well communicated online. Students may find it useful to begin a tutorial with a brief presentation – perhaps using PowerPoint slides or diagrams – to set the agenda for the meeting. Tools such as Zoom and Microsoft Teams allow participants to share their screens, so that both student and supervisor can look at a document such as a draft thesis chapter. Websites like Google Docs and Overleaf go one step further, allowing two people to simultaneously edit a document. Finally, in disciplines where visual communication is important, for example in discussing diagrams, the use of a shared whiteboard accompanied by an electronic pen such as the Apple Pencil, or a document camera, can allow students and supervisors to replicate the kind of work that is traditionally done face-to-face at the board.

Whether supervision entirely at a distance is possible remains to be seen. There is a distinctive aspect to how voice, body language, and physical presence come together to help spark off ideas that is difficult to replicate entirely online. It is undoubtedly the case, nonetheless, that online supervision will play some role in many students' PhD experience, and being equipped with the skills to do this effectively will become increasingly important for supervisors.

Supervising your research or teaching assistant

A particular challenge is supervising someone who also works for you in another capacity, for example as a teaching or research assistant. This is partially a matter of time management. Students will need advice about how to balance the short-term pressures of teaching against the longer-term need to work on their PhD. In particular, they need to learn not to put excessive time into their teaching as an avoidance strategy during difficult periods of their PhD studies. You should also be aware of conflicts of interest. Do your PhD students feel unable to open up to you about problems with teaching because they feel that they are letting you down or over-burdening you, and therefore you might think less of them as a research student?

> Dafna was a student finishing her PhD. In addition to her PhD work, she was also working as a teaching assistant on one of Prof. Dasgupta's modules. She had been told that Prof. Dasgupta was going to be the internal examiner for her thesis. She felt that she was not getting the support that she needed with the teaching, being required to spend long hours preparing worksheets and class exercises, which were normally prepared by the module leader. However, she suffered this in silence because she was afraid that if she raised the issue, Prof. Dasgupta would consider her less competent, and give her a harder time in her viva.

If your student is also a research assistant on your funded project, then you have two roles, as a supervisor and as a project manager, which are not entirely congruent. Sometimes, for example, the student might have gained enough data to demonstrate a point for the purposes of their PhD work, but the project requirements include a larger data-gathering exercise.

Effectiveness in this situation requires three elements of good practice from the supervisor. The first is to get agreement, as early as possible in the project, on what is the precise nature of the PhD study and how it differs from the remainder of the research programme. The second agreement needs to be on what amount of time it is appropriate for the student to spend on thesis work – perhaps a minimum and maximum per week as a guideline. Third, supervisor-managers should recognize that they have these two roles, and articulate this to their student. In their understandable commitment to managing research projects to a successful outcome, they must not neglect the important educational service, which they need to give as supervisors. This can be reinforced by a team supervision process, where you have a co-supervisor who is not involved in the funded project to help ensure that focus on the PhD is retained.

Working as part of a team of supervisors

In Chapter 6, we discuss the advantages and possible problems of team supervision from the student's point of view. Here, we review the process from the point of view of supervisors. All the supervisory tasks that we have discussed earlier in this chapter have to be undertaken by the appointed team. This may spread some of the burden, but inevitably introduces extra complications in the student–supervisor relationship.

There are several characteristics of successful team supervision:

- There is a clear lead supervisor (the term Director of Studies has been used), who takes first 'ownership' of the student's progress. The other member(s) are prepared to take a supporting role.
- This division of responsibilities is discussed and agreed among the supervisors, who are committed to functioning as a team.
- The members of the team are clearly complementary in their interests and skills. Apart from widening the range of inputs into the student's thinking and practice, this obviates any feeling of competition for the student's allegiance.
- The second and third supervisors do not merely echo the first supervisor. They are there to provide different inputs to support the student's work.
- All members of the team together meet with the student in regular progress reviews, usually termly. These full progress meetings are key to

developing an overall academic view of the student's research to which all members can subscribe.

- The members avoid giving contradictory advice at separate tutorials. This not only discourages students, it reduces their trust in the supervisors' expertise.
- At the full meeting, however, disagreements can be valuable, demonstrating different perspectives and showing that research directions are developed by active discussion of alternatives. It is important, however, that the student is actively involved in this discussion, and that a clear conclusion is reached about next steps by the end of the meeting.

The above description of the team system is couched in rather idealistic terms. We have seen such set-ups working, and participated in them, and they result in satisfaction all round. An important function of the arrangement is that it gives beginning academics, who themselves were doctoral candidates not so long ago, their first experience of supervising. This can be very helpful in communication both ways: to the experienced lead supervisor in understanding what the student is struggling with, and to the student in understanding what the supervisor is proposing. One drawback is that if the lead supervisor has to withdraw, then it is likely that the team will have to be completely reconstituted as neither of the supporting members would be in a position to take over.

But, as with any system, it does not always work out as intended.

The most common limitation is that the second and third supervisors, who are busy people, let the lead supervisor take over completely. They miss progress review meetings, and even when present give the impression of not being fully engaged. This defeats the object of the exercise. After all, one of the purposes of team supervision is to improve things when the relationship between the student and the lead supervisor is not going well. When it is, the arrangement is accepted, and the second and third supervisors are only nominally involved.

At the other extreme, the members of the panel might not be very sympathetic to each other's approach to the research (or, indeed, to each other) and allow this to be made clear to the student in meetings separately. They may even compete for the student's loyalty which is detrimental to the student's morale and progress. It needs the attention of the departmental research tutor (or equivalent role) to intervene and make other supervisory arrangements.

Most teams operate between these two extremes, with considerable variations in the input of the supporting members of the team. A feeling of mutual professional and personal respect between supervisors is vital if the team system is to work, and this should be taken into account in the constitution of the teams.

Helping your students to work in the academic environment

As we emphasize in our advice to students in Chapter 9, working in an academic environment is different from other kinds of work, and studying for a PhD is different to other kinds of study. Even if your students are coming to their PhD immediately from undergraduate or master's studies, they will still have a substantial adjustment to make in order to be productive in research.

It is therefore advisable to have an explicit conversation with your new students about their prior experiences, and their assumptions about the work environment that they are expecting to encounter during their PhD. The assumptions of a beginning PhD student who has completed a decade of professional work might be very different from someone who has just completed their undergraduate studies.

Part of this conversation is about the skills that the student already has, and those that they need to develop, including their generic research skills. A structure such as the Vitae Researcher Development Framework (https://www.vitae.ac.uk/vitae-publications/rdf-related), which gives a taxonomy of various generic research skills, could provide a starting point for such a discussion. The downside of this is that it can be hard for students at the beginning of their PhD to understand the relevance and context of these skills, so it is likely that this would be an ongoing conversation rather than a one-off discussion.

Expectations about when students will attend the university

You should discuss with your students when you are expecting them to be physically present in the department. In a laboratory, where members are expected to help each other with experiments, a regular 9–5 schedule might be reasonable. At the other extreme, some supervisors might only expect their students to come into the department for tutorials. As part of this discussion, make it clear what working spaces are available. Do students have a dedicated desk, a shared workspace, a part of the lab, or no working space in the department at all? What access do they have to common rooms, and so on? If this is not clear, students might be embarrassed to ask.

How to cope with no fixed hours of work

It is important to discuss with your students how they are going to manage their time, particularly if they are coming from a job where they are accustomed to having fixed hours of work. Another aspect of this is making it clear how many hours of work the university is expecting of them. A full-time student should be working similar hours to those required of a full-time job. You should make it clear that this is the level of commitment needed, not more or less.

Whilst we accept that periods of intense work will be necessary, for example in the run up to a conference deadline, it is important to set the expectation that a PhD should not take over every hour of your student's life. As part of this, you should ensure that students do not feel guilty about having outside interests and are encouraged to take a sensible amount of annual leave. For example, you might ask students at the beginning of the summer vacation when they are planning to take their holidays, thus making it a normal expectation that they will take some time off. A common reason for the breakdown of relationship between student and supervisor can be unreasonable expectations by supervisors about work commitments, sometimes tacitly expressed.

Allied to this, students should feel comfortable telling you that they think too much is being expected of them. This is often a case of the student not knowing how to do a particular kind of task efficiently, rather than being a genuine case of supervisors expecting too much of them. For example, students might not know how to read a paper purposefully and tactically, and waste time by trying to understand every fine detail of what they set out to read. For example:

> Kwame was a student who started a PhD after a decade working as a laboratory technician. He had performed excellently in his job, which he had taken up following a good performance in his first degree. He struggled to adapt to PhD studies. In his working life, he would show up to work each day, be given a list of tasks to do by his manager, and work diligently through them. Whilst he could focus on the details of a specific task set by his supervisor Prof. Keeble, he struggled to link his large, ambitious research question to the day-to-day tasks that he needed to do. After a year of struggle, he recognised that a PhD was not for him – however hard he tried, he could not develop the skill of taking a large, complex task and breaking it down into smaller ones.

As illustrated above, students can struggle with the unstructured nature of the day, particularly if they are coming from a job where they were given tasks on a day-to-day basis by a line manager. Such students need you to tell them about how the role of the supervisor differs from that of a manager at work. Furthermore, discussing how to plan work is very useful. In particular, both student and supervisor need to recognize that when doing a PhD, you need to keep in mind various different time-scales – the whole PhD, the current project, the immediate piece of work – and how they interrelate.

Part-time and mature students

In Chapter 9, we provide specific advice to part-time and mature students, and if you are supervising any of these students, we encourage you to read this section. As a supervisor, you should pay attention to how part-time

students can be integrated into the departmental culture. This can be a challenge because they sometimes cannot attend activities, such as research seminars and training courses, that are held during core working hours. Perhaps you can work with other supervisors of part-time students to help them organize an out-of-hours journal club or discussion group in the department. You will also need to have a more direct conversation with them about how to manage their time and their working space.

Many new PhD researchers will be 'mature' students, having dedicated years to family or work responsibilities before embarking on their post-graduate studies. For these students, conversations about expectations can be particularly important, as they might bring out tacit assumptions about styles of work that are inappropriate for the PhD. You should avoid ageist biases about the intellectual capabilities of mature students, or their ability to focus on work. Equally, you should make sure that you don't make excessive demands on them, or think that they will be more competent than younger students, because of their wider experience. Introducing them to mature student groups within your university is useful.

Helping students adjust to the British cultural environment

It is also important to understand what assumptions your students are bringing to their PhD because of the culture in which they carried out their previous studies. For example, some educational cultures stress deference to teachers (or more broadly, deference to elders), and students from such cultures can struggle with developing the independence required for PhD studies. Helping such students to respectfully disagree and present their own perspective is a challenge. One way to help with this is to use role-playing exercises where they have to argue for a randomly chosen position on some topic or other – ideally, one far from their academic field. This can help students to recognize the difference between taking a well-argued academic position in conflict with others, versus having a personal conflict with that individual.

More challenging can be students' assumptions about gender, race or status roles. We give some examples in Chapter 9 about how to tackle these difficult issues, which you might find useful if confronted by any such problems.

Language

A particular challenge for many students is working in English for the first time. Even if students are competent users of English, that does not imply a competence with academic English. Another difficulty can be understanding the rich variety of figurative language used in everyday conversation. It is

important to strike a balance where you are not over-simplifying, but where you help the students to develop their vocabulary and use of language. Do not shy away from using a more complex phrase or expression, but offer a brief explanation. Working through a passage of writing in fine detail can be of value, whether this is the student's own writing or something from a published work. It is important, however, to emphasize that this is an exercise and that you will not be able to pay this amount of attention to every piece of writing.

Giving advice on language can be particularly problematic for supervisors who do not have English as their first language. Again, this is where group supervision can help. Many universities also have a variety of support mechanisms to aid students with their writing: group workshops, writing-focused buddy schemes, and in some cases one-to-one tuition. Your students might find these particularly useful if you do not have the confidence to help them develop their writing.

Role models, mentors, and support groups

In addition to what they learn from you as a supervisor, students learn from a wider group of people around them. Most immediately, they might learn subject-specific material from other academics such as through lecture courses, conferences, research seminars, and interactions online.

You should encourage your students to get to know each other, particularly students at different stages of their studies. This could be facilitated, for example, by having some group supervisions or running a discussion group or journal club. Students can learn from one another, not just about their subject, but about the patterns of work at each stage. This can also help them to battle the feelings of loneliness and isolation that many research students feel.

Of more interest is what they learn from others about the *process* of doing a PhD. What role models do they have for PhD success, and how do these shape their view of what doing a PhD means? The 'role' that role models can play varies: your students might learn from other students who are a year or two further on from them, or they might model themselves on a successful person from their background or demographic. As a supervisor, you can assist in this process by discussing a diverse group of examples of successful people in your field, and ensuring that visiting seminar speakers represent a wide range of people.

Having such role models can help students with their motivation by providing examples of success. It is important, however, that they do not overestimate what is required in their PhD. As we point out in Chapter 4, even people who made a revolutionary change in their fields such as Marx and Einstein made competent but modest contributions to knowledge in their PhD theses, and only later made their transformational contributions.

Some institutions will have more formal mentoring/buddying schemes for PhD students. We discuss these in more detail in Chapter 9, and you should encourage your students to get involved in them. You should also draw your students' attention to the breadth of support groups that exist in most institutions.

If you grew up with some familiarity of PhD study – for example, a close family member had a PhD or was studying for one – remember that not everyone is in the same boat. Many people will not have had any experience of PhD study in their upbringing, and so it is important to make explicit some of the assumptions that might be second-nature to you. Indeed, one of the roles of this book is to articulate these assumptions clearly.

Supporting students when things go wrong

Whilst we hope that students will progress through their PhD work without any problems, it is a sad fact that issues such as harassment, abuse, discrimination, and bullying sometimes do occur, and that students may have health concerns.

In Chapter 9, we discuss how students can tackle such situations. Your role as a supervisor is primarily to be a supportive sounding board, and not to casually dismiss students' concerns. In addition, you should make sure that you are familiar with the processes and support that are available within your institution for such students, so that you can direct them to the right unit.

Stress and health issues

Students benefit enormously from avoiding negative stresses in their lives. Not everyone will be healthy throughout their studies, and many students are successful whilst managing a long-term physical or mental health condition.

Your primary role as a supervisor is to look after your students' academic development, and not be responsible for their health. You are not their doctor or counsellor. Nonetheless, you can help your students stay healthy by modelling and encouraging healthy study habits, and making it clear that you expect students to have time for exercise, de-stressing, and to have a personal life and interests outside of their PhD.

A particular challenge can be supervising a student with a longer-term condition, particularly a mental health condition. Unlike a short-term mental health or physical setback, a period of recuperation, through interrupting their studies, will not necessarily return them to full health.

Some students will have to manage an ongoing, potentially life-long condition, alongside their studies. It is our conviction that such students can be

successful, but as a supervisor you need to consider how to make supervision work best for them. In Chapter 12, we give advice to institutions about how to develop a better support system.

In particular, some of them will have an uneven pattern of work based on the ebbs and flows of their condition, reactions to medication, etc. Therefore, you will need to adapt your assumptions about progress. As long as the student is making good long-term progress, you should not be overly concerned about short-term dips in productivity.

Harassment, abuse, discrimination, and bullying

How do *you* avoid being a bully or being abusive to your students? Almost no-one sets out to act deliberately in this way, but clearly some people do slip into such patterns of behaviour. You should be aware of the impact on students of what you say.

Think about what you say and how it might be interpreted, particularly by someone who may be a little afraid of you owing to the power dynamic in the supervisor–student relationship. In particular, be aware of the impact of your language on students with autism, or students whose English skills are weak, who might interpret what you say in a very literal way.

> Shadacia was a PhD student in Dr Sakamoto's lab. One day, at the weekly lab meeting, Dr Sakamoto mentioned (as a joke) that rather than spending some recent grant money on a new spectrometer he was going to spend it on taking the lab members on holiday. Shadacia interpreted this literally, and saw the next phase of her work fall apart because she would not have the equipment that she needed for her experiments. She ran out of the meeting, and refused to speak to her supervisor for weeks. Their relationship never got back on track, and she had to transfer to a different supervisor in order to complete her PhD.

Furthermore, it is important to take colleagues seriously if they call you out for inappropriate behaviour. It is very easy to be defensive in the face of such an accusation – 'what, who, me?' – and learning to take such feedback seriously is an important part of your professional development.

Another way to avoid problematic behaviour is to understand your own, tacit biases. You should take the opportunity to attend sessions on unconscious bias, which aim to bring to the surface subtle biases that you might have about particular groups in society, and use this awareness to correct them. You should also be aware of microaggressions – small behaviours that can make people uncomfortable. A common example in the international environment of a university, is not bothering to learn how to pronounce the diversity of names that you will encounter. This can easily be perceived as you not caring about students from other nationalities.

Exploitation

It is important that you do not slip into a pattern of exploiting your students. It is reasonable to expect PhD students to help with the wider life of the department and your research group. This could be through helping with public engagement in your subject, organising research seminars and conferences, assisting with student recruitment, and doing day-to-day tasks in the lab.

This can, however, tip over into exploitation. You should not expect your students to be a sort of personal assistant, nor should you expect them to spend their own money. If you ask students to help with a larger project that isn't directly related to their PhD, this should be balanced out with some benefit – payment for the additional work or credit on a publication. Again, small amounts of help are reasonable, but some supervisors can get students to do a lot of work (e.g. for a single-author book, public talk or policy briefing) for which they get minimal credit. Avoid over-burdening students and think about ways in which you can give them credit. Similarly with teaching – a short talk about a student's own research in a lecture is fine, but expecting them to take your lectures and classes for a couple of weeks whilst you are away (on top of their own teaching) is in most cases unreasonable.

It is important to recognize that as a supervisor, you can be a 'single point of failure' for your student. If you fail in your supervision, then the student can fail to make progress on their PhD. This is one of the reasons why we strongly advocate a team supervision approach.

As noted in Chapter 9, students are also capable of exploitation. This is particularly the case where they are working with vulnerable populations. You should be aware of this – and ways to mitigate it – when discussing such tasks with your students.

Of course, bullying and harassment can work both ways. You should be aware of the potential of abuse being inflicted on you by students, and make effective use of staff unions and support groups if this happens. More broadly, having a network of colleagues (whether formal or informal) with whom you can discuss such problems as well as the loneliness of supervision can be of great benefit.

How to examine

Supervisors are not allowed to be the examiners of their own students, but they are often called upon to examine others. They act as internal examiners for students of their colleagues and external examiners for students of other universities. How should they set about this important task?

First, we must reiterate that it is not possible to set rules and regulations that allow the standards for a PhD to be established in a mechanical or bureaucratic way. In general, examiners look for conceptual understanding,

critical ability, and an explicit and well-structured argument. There is usually basic agreement within a discipline concerning what examiners are looking for in a good candidate.

Even so, EMP found that supervisors and examiners find it difficult to articulate the competence required for a good PhD. They tend to see each as a unique product not open to generalization. They claim to recognize when a thesis is really bad, but say that only experience teaches them to know what is interesting and exciting.

The regulations of the university usually include phrases like 'making a significant contribution to knowledge or understanding' and 'demonstrating a capacity to undertake independent research'. These have to be applied in a range of situations that inevitably involve a judgement on the part of the examiners as to a particular student, in a particular discipline, at the time of examination.

Examiners, like students, have to be aware of what standards are being applied in their discipline by regularly reading and pondering newly successful PhD theses. They need also to be aware of articles being published in journals in their field to be able to recognize what currently is considered worthy of publication in their discipline.

The examining process may be helpfully compared to refereeing articles submitted for publication to journals. These give an idea of standards at the forefront of the discipline. They help examiners to address such questions as: Does the thesis show impressive depth? Does the student demonstrate excellent critical understanding of the issues involved? Has the student creatively integrated the research material to indicate attractive future lines of work? In practice, these questions are about demonstrating the student's competence: is there sufficient depth, adequate critical understanding, sufficient integration of the research material? Having addressed such questions, the examiners then have to decide: is this good enough?

It may be helpful to reflect that, just as a First and a 2.2 are both regarded as acceptable honours degrees, so a PhD thesis may be considered acceptable even if it is not consistently excellent.

Students, however, are often confused about what is required of them and this is where guidelines on method and form are important at the beginning of the PhD journey. Even when provided with some information, students can still feel frustrated that what they are being told does not accord with what they were hoping to hear. One student expressed what many feel when he said: 'At the seminar where the basic outline of a thesis was recommended there was an emphasis on the problems of having to reduce an exotic, once in a lifetime experience to a dry as dust thesis format'. It is here that supervisors have to help students come to terms with the fact that there is a standard form to which the thesis must adhere.

One topic that is often raised in the discussion subsequent to the oral defence, is the problem of assessing a candidate who has clearly been the victim of inadequate supervision. By implication, the supervisors involved

will feel that they, too, are being examined and become very defensive in arguing their case. Indeed, it was for this very reason that supervisors were eventually precluded from being internal examiners of their own students, as used to be the procedure in most universities.

Examiners have therefore to decide whether it is fair that the candidate be penalized for what is patently a failure of the supervisors. Nonetheless, since standards have to be maintained, sympathy for the candidate will be properly limited to allowing the conditions for the resubmission to be as generous as possible.

As noted in Chapter 3, funders put considerable pressure on universities to complete the process of doctoral education and get candidates to submit their theses within four years of registration. As a result, they have pushed up the percentage of students who submit within this time. But this change has led some to wonder whether the limit imposed has caused a rush to submission and therefore an increase in the proportion of candidates who are referred for further work.

A less fortunate outcome would be pressure on examiners to allow borderline theses to pass on the argument that the university department needs to achieve a certain threshold of passes for appraisal purposes. These pressures must be stoutly resisted, if for no other reason than that research funding bodies strongly proclaim that it is not their purpose to drive PhD standards down, only for them to be achieved more efficiently.

As we discuss throughout this book, the aim of the PhD process is to help the student to become a fully professional researcher. The PhD examination reflects this, as described in Chapter 10.

The degree is awarded based on the candidate's academic achievements, which include the thesis itself, defence of it at the oral examination, and any supporting material in the discipline that the candidate has carried out and published. The viva is thus a key part of the examination, and it is inappropriate to decide that the thesis itself justifies the award of the PhD degree before it has been defended. This is for two reasons.

First, it is one of the functions of the viva for the examiners, through their questions, to satisfy themselves that the thesis is genuinely the work of the candidate; they even have to sign a declaration to that effect. Second, as we explain in Chapter 10, one of the possible, though rare, outcomes of the process is for the examiners to decide that the written thesis was adequate, but the defence of it at the viva was not. The PhD will not then be awarded and a new oral examination will be arranged, allowing the candidate time to gain a better understanding of the implications of the research and thus to conduct a better defence.

The oral examination

The oral examination is what remains of the original formal public disputation that took place on the presentation of a thesis in the Middle Ages, after

which the audience voted on whether to award the doctorate and admit the candidate as a member of their faculty. Now the oral examination in Britain consists of a discussion prompted by questions and comments from two or, occasionally three, examiners.

There are considerable variations in the conduct of the viva. Candidates' descriptions of their experience of the viva range from a pleasant after-tea chat to a persecutory inquisition. We give what we consider to be a useful structure for the examination that avoids these two extremes.

We must begin by pointing out that most students are given little or no information about what to expect in the oral examination. However, there are some publications that have tried to rectify this by providing some detail about what goes on (Murray 2015; Smith 2014), which may be of help to both candidates and examiners.

As Tinkler and Jackson (2004) point out, the oral examination 'is a source of concern and confusion for many supervisors and examiners'. Since nobody talks about it formally, much of what candidates believe happens is told to them not by their supervisors but by other research students – they may not even know who is going to be present. They may have heard that there will be general discussion of the whole thesis, and that sometimes enormously long PhDs are criticized on just one small detail. Students expect something really tough, with examiners who try to take their work apart in order to give them the opportunity to defend it. They see it as a battle and most are terrified.

One way to reduce this fear is for the supervisor, or another experienced examiner, to explain carefully to the student what they should expect in the viva, both in terms of structure and content. It is also important to explain to the student what they need to prepare (see Chapter 10). You should emphasize that, whilst standards are high and the examination must be rigorous, the examiners and student are ultimately on the same side, all wanting the student to succeed.

In addition to the candidate and examiners, some universities also appoint an additional academic to chair the meeting. If you are asked to do this, your role is to ensure that the discussion is conducted in a clear and orderly fashion, but not to take part in it. In universities that do not appoint a chair, the internal examiner must manage this role alongside asking questions about the work.

It is important for the examiners to agree the roles they will take and the structure of the viva in advance. Will you ask the candidate to do a brief presentation at the beginning (we discuss the merits of this in Chapter 10)? If so, you need to inform the candidate in advance. How will you structure the questions? This is often arranged in an immediate pre-viva meeting. You should also make sure that you include some brief preliminary material to put the candidate at ease: a common question is, 'How did you come to study this topic?'

Remember also that the viva can last a long time. We recommend that they should not last more than two-and-a-half hours. It is important to let

the candidate know that they can ask for a short break if needed, and for the chair or internal examiner to suggest one if the viva is likely to run over two hours. This allows the examiners to review what has taken place and the candidates to renew their energies.

Most universities allow the supervisor to sit in on the viva as a silent observer. In some universities, this requires the permission of the student. It is up to you to judge whether this is appropriate. It is an advantage for the student to have a familiar person in the room, but some supervisors find it difficult to refrain from comment.

Outcomes of good supervision

In concluding our discussion of how to supervise and examine, let us reflect on what we believe would constitute a satisfying result of good supervisory practice for both the student and the supervisor. This would entail:

- a doctorate of quality completed on time;
- advancing the topic as a result of the research;
- a paper presented at a conference, so that the student has faced external criticism;
- meeting other professionals, allowing the student to argue with and impress them so that they may be used as possible additional referees;
- a paper published in an academic journal, so that the student has experienced the journal refereeing process;
- the student being adequately prepared for a future professional research career, inside or outside of academia;
- a stimulating experience for both the student and the supervisor, which has set the student on a research career.

The self-evaluation questionnaire and topics for discussion on doctoral supervisory practice, given at Appendix 2, are intended to help you focus on the issues raised in this chapter.

Chapter **12**

Institutional responsibilities

Action summary

1. Ensure that the university fulfils its responsibilities in relation to PhD students.
2. Provide support to doctoral students through the establishment of facilities for departments, additional essential information, and any necessary language tuition.
3. Provide a clear handbook for doctoral researchers and regular two-way communication between the university and students.
4. Provide resources for the allocation of teaching credit for doctoral supervision.
5. Provide appropriate regulations for doctoral education and a forum for the regular review of the nature of the PhD.
6. Ensure that medical and counselling staff are aware of the specific needs of PhD students, and that supervisors are trained to supervise students with a long-term health condition.
7. At the departmental level, ensure that the doctoral research tutor has sufficient authority to monitor and improve the functioning of doctoral education.
8. Regularly review the selection methods and criteria for acceptance of students into the department.
9. Develop guidelines for the selection of supervisors and appropriate supervisory behaviour.
10. Provide mechanisms for establishing collaborative groups, buddy systems, and opportunities for students to meet across the university.

This chapter is aimed at university decision-makers. The infrastructure provided to support doctoral students is an important part of their success, and consequently an important part of the research success of the university. In the last couple of decades, pressure from quality assurance and funding bodies, as well as reflection on PhD study within universities, has

led to a number of changes in doctoral education. In particular, this has included more careful and consistent monitoring processes for student progress, improved skills training and career development for PhD students, and increased commitment to training and development of supervisors. Our aim in this chapter is not, therefore, to recapitulate what is already well discussed elsewhere, but to discuss opportunities for universities to improve their PhD students' experience, the quality of their work, and the efficient completion of PhD degrees.

University responsibilities

A university-wide graduate school or research institute for doctoral students

Most universities have now established a graduate school (graduate college, research institute or researcher academy). This provides institutional recognition that PhD students are an integral component of the university for whom resources are available. By running training courses and networking events, it helps to build a community of scholars across the university. In some universities, this same unit is responsible for the generic training and development needs of postdoctoral staff, too.

The graduate school has a number of tasks, including providing facilities for departments to support doctoral research activities, mounting a university-wide structured induction procedure, contributing an informative (and comprehensible) university research student handbook, and supplying, where necessary, English language tuition focused on writing in a style appropriate for a PhD.

It also has a training role. The training is identified by widespread use of a needs analysis (TNA) to inform selection of training programmes. The second task is to provide support for supervisors, including provision of resources for training (particularly in the non-technical, relational aspects of the supervisor's role) and in recognition for teaching credit of supervisory activity. The Researcher Development Framework (www.vitae.ac.uk/researchers-professional-development/about-the-vitae-researcher-development-framework) is now the accepted benchmark.

Clear handbooks, web pages, and induction events are important; in particular, these should emphasize which areas are the responsibility of the graduate school and which are delegated to departments.

Support for students

Facilities for departments to support doctoral research activity

The university should have some facilities such as common rooms that are dedicated to postgraduate students, beyond the working facilities available

in departments. These can provide a focus for PhD students to meet one another from across the university. These could be organized by faculty or spread evenly across campus, and should be in a visible location, ideally on the ground floor of buildings to encourage casual use. It is a good idea to hold some induction events in these rooms so that students become accustomed to going to them. The institution should ensure that there are adequate facilities for research students such as, for example, laboratory space and apparatus, access to a technician, as well as the more general resources of adequate library and computing services.

In order to encourage successful research and a feeling of belonging to an academic community, universities must set aside financial resources for research students' use. The majority of these are likely to be modest: purchase of software, subscriptions to online services, laboratory consumables, photocopying, etc. The largest cost is likely to be travel. It is important that the university ensures that each department has a clear and well-publicized policy for making decisions about when travel to a conference will be funded: does the student have to be presenting work, or are they allowed to attend events in order to broaden their knowledge of the field? A similar policy should apply to training courses, fieldwork, and library/museum visits. As well as a policy for making these decisions, the application process should be clear.

It is also important that facilities and resources available for full-time students are at the disposal of the increasing numbers of part-time students. Library hours, for example, may need to be extended so that students who are not on campus during usual working hours can still gain access to books and journals. The availability of computer facilities and specialist statistical help may also need to be extended, as might the availability of skills training courses. Similarly, it is important that students based at remote campuses or study centres have access to such facilities and activities, either through online access or through supported travel to a relevant location.

Handbook and communicating with students

The handbook for university research degree students should be regularly updated. It is an important part of communicating the nature of research degree study and the university framework within which it takes place. Key information should include: a description of the university structure, regulations for registration, upgrading, fees, examinations, awards, and a code of practice for supervisors and research students. This should be prepared with the participation of research student representatives. The code spells out what can be legitimately expected by students of supervisors (e.g. appropriate expertise of the supervisor in the subject and topic, minimum frequency of supervisory tutorials, prompt and constructive response to submitted written work). It also describes what supervisors can expect of

students (e.g. to work conscientiously and independently, to keep a lab record of experimental work, to present written work at the agreed time). The handbook should be clear and formal, but written in a way that is accessible to students. A model to follow is the *Highway Code* (Department of Transport, 2021), which presents a mixture of law and good practice in a way that is accessible to all road users.

It is also the responsibility of the institution to provide, within its regulations, an ethical and professional code for staff to follow. This should provide guidelines particularly relevant to research students, such as the ethical aspects of experimentation and data collection, the inadmissibility of plagiarism, and data falsification. Issues of harassment and establishing appropriate relationships between staff and students should be included. Remember, too, that it is only through anonymized monitoring of demographic characteristics that universities can tell whether they are treating students fairly and if they are really providing access to research degree study for students from different backgrounds. Correctly implemented, it can help to inform not only against barriers to access but also against barriers to successful progression once access is gained.

The university should maintain regular two-way communication with research students. Termly newsletters can provide a sense of belonging in the university, give motivating examples of success, and supply a steady feed of advice to students. A particularly successful model is where these are jointly produced by the graduate school and a team of students, providing a mix of student voice and professional production. There should be easy means for students to voice both ideas for improvements and concerns, whilst not over-burdening students with too many surveys. One way to realize this is with an online 'suggestion box' together with publicity when suggestions have been taken up.

English language support where necessary

When students from non-English-speaking backgrounds are accepted for a research degree, it is the responsibility of the institution, not the individual supervisor, to provide English language training. The university should make provision for this by offering classes to all who need them. Native English speakers, especially someone with dyslexia, may benefit from these classes too, as academic and scientific writing is very different from writing of other kinds. Furthermore, it is important that students improve their English throughout their studies. For example, by submitting papers early in their programme, by presenting written work to their supervisors frequently from the beginning, and by giving presentations both within the university and at external conferences and workshops. It is important, too, that standards of English are carefully examined at entry, and that potential supervisors are not allowed to override these in their excitement to take on a new student.

Induction, support, and encouraging a culture of belonging

Institutions must have a good induction programme for welcoming students into the university and ensuring that they know how their PhD programme works and how to study effectively. Most students will not know anyone who has studied for a PhD before, or how PhD research differs from undergraduate and master's study. Therefore, it is important to explain the various aspects of how to become an effective PhD student. This should not only be concerned with the formal rules; it should also cover a range of topics about how to work effectively, including time management, how to develop research skills, managing supervisors, and work/life balance. It is important to explain even the most basic ideas. The suggestions in Chapters 2 and 9 will be helpful here. Events where students get to hear from a variety of people – administrators, supervisors, and a diversity of students at different stages of study for the PhD – are important. This should not neglect advice for specific groups such as part-time and mature students.

Schemes where students can meet each other both within the department and across the university are another valuable source of support. These should either be run directly by the university, or encouragement and funding be given to the student union to help organize them. They range from buddying and mentoring schemes, where students are supporting each other in small groups, to societies and activities for PhD students, including those with specific needs.

It is particularly important that universities have strong policies and practices to tackle the worst excesses of power: harassment, abuse, discrimination, and bullying. Some of these actions will be targeted at people in positions of authority such as supervisors. These include training in unconscious bias, how to avoid common pitfalls that can result in unacceptable behaviour, and active bystander training so that staff are empowered to intervene where they see these behaviours. A clearly communicated set of behavioural norms should be established, together with effective disciplinary processes for staff who violate these. The university should also ensure that such norms are part of the day-to-day working culture to avoid problems happening in the first place. It is also important that students are aware of how to raise complaints, and that these are seen to be taken seriously and acted upon rapidly by senior staff. Such abuses of power, however, can also be committed by students, whether in relation to another student or someone with whom they are working, such as a participant in a study. There are more detailed ideas about these topics in Chapter 9.

An important part of tackling these abuses of power is to have a strong and well-publicized mechanism for whistleblowing. Students should know where to take their concerns, outside of the usual complaints structure, to raise an issue to be investigated. The anonymity of whistleblowers is paramount, and any issues raised need to be investigated quickly. A collaborative

approach between the university and students union would be a good way forward.

Overall, the aim should be to encourage a culture of belonging (Pathak, 2021) in the university across all research students. One way to improve this can be to form working groups that include a wide diversity of students, focused on breaking down barriers to this sense of belonging, and finding out what students need to know about PhD study. We advise that student participants in these groups are paid for their time, so as to involve students who would otherwise be excluded from participation because of pressures of paid work, childcare, etc.

Even though around a quarter of research students are not full-time, there is a need for more awareness of the difficulties experienced by part-time students, as discussed in Chapter 9. These difficulties occur in many areas, but in particular, time allocation and financial pressures during the period of study are common causes of stress for many of them. Sources of support during the period of study must therefore be given special attention in order to ensure that nobody is accepted until the department is satisfied that the applicant will not suffer undue financial hardship as a result of their registration.

Careers support specifically aimed at doctoral researchers is important. PhD graduates go into a wide variety of jobs, and university careers services should be aware of the distinctive needs of research students in presenting themselves to employers, so that they run appropriate events and give relevant advice. This includes helping students to present the skills that they have learned during their PhD in a such way that they are comprehensible to employers outside of academia.

Support for student health and wellbeing

It is important that students have access to support for both mental and physical health. In a recent survey of research students (Pitkin, 2021), only two-thirds of PhD students thought that their university provided sufficient support for health and wellbeing.

Clearly, much of this support will be provided by university-wide services such as the medical centre and counselling services. It is important that the graduate school work closely with these services so that they can provide appropriate support specifically for PhD students. We would recommend that a working group is set up with students, supervisors, and these services so that the support provided takes into account the specific needs of doctoral researchers. For example, there are important contrasts with undergraduate education, particularly because at the PhD level students are working on a single large project under the supervision of a small number of supervisors. Therefore, problems with supervisors can have an enormous personal impact, and it can be difficult for PhD students to detach mentally from the stresses of their work.

It is important that these services are mentioned to PhD students at induction. It is easy for institutions to neglect this, making the false assumption that postgraduate students will know about it from their undergraduate years. Furthermore, induction can usefully include some sessions on topics such as time management, recognizing stress, interpersonal relations, and developing an appropriate mindset, thus giving students a toolkit to help them cope with the vagaries of PhD study.

One problem with mental health support in universities is that a large number of different issues are included under the 'mental health' umbrella. These include (a) the day-to-day stresses of everyday life; (b) ongoing issues caused by intolerable external factors, such as workloads and interpersonal interactions; and (c) potentially life-threatening individual health conditions. It is naive and dangerous for institutions to group all of these together in a single approach. Support for the day-to-day stresses (e.g. through mindfulness or meditation sessions) can be useful, but these do not address the more significant issues. If they are the only source of support, these efforts can seem patronizing and tokenistic to people with more serious conditions.

The recent UKCGE (2021) survey noted that only 56% of supervisors felt adequately supported by their institutions with regard to the mental health and wellbeing of their students. One area that is often neglected is the need for supervisors to receive training in supervising students with ongoing disabilities and mental health needs. Supervisors must recommend that students with mental health issues consider getting appropriate professional support from a counsellor, therapist or doctor. Supervisors should not be acting as amateur counsellors. Nonetheless, there will be students with ongoing, long-term mental health needs who will require continuing academic supervision. Training supervisors to provide such supervision is essential. This complements support that students are getting with their condition from appropriate professionals – neither is sufficient alone.

The health needs of PhD supervisors should not be neglected. We would encourage a university-wide consultation on how working patterns impact on staff health, and to disseminate examples of healthy working practices, and how the management of departments can support this.

The recent Covid-19 pandemic has also demonstrated the need for universities to pay attention to the physical health of all members of the university. In situations such as these, it is important that universities take appropriate professional advice and communicate clearly what the institution's policies are, for example in terms of social distancing, mask wearing, ventilation, etc., and not leave these to individuals.

Resources for supervisors

Teaching credit for doctoral supervision

It is important that doctoral supervision is incorporated into workload allocation models used by departments to apportion teaching, research,

and administrative duties. If supervision is seen as an added extra that supervisors should feel privileged to take on because of status, then it is easy for supervision to fall behind because it is being done out of the goodness of their heart and supplementary to their 'real' duties. The recent UKCGE (2021) survey showed that only 52% of supervisors were confident that supervision was fully recognized in their workload allocations, with a further 23% being unsure about this. This is an issue that has been raised for many years – indeed, it was mentioned in the first edition of this book (Phillips and Pugh, 1987) – so it is time that this important issue is dealt with once and for all. Some institutions inappropriately regard supervising PhD students as research work rather than teaching and so give no teaching credit. Supervision needs to be recognized as an important staff role and counted as time spent on teaching duties, in a similar way to lecturing and attending to the needs of undergraduate students. Supervision of research students should be accounted for in staff planning schedules and budgeted for accordingly, both in terms of staff time and financial costs.

Exactly how much time should be allocated will vary from discipline to discipline, but it should be enough to allow a regular, substantial supervisory meeting, time to thoroughly read the student's work, and time to keep up-to-date on research literature of relevance to the student's project. Guidelines should also be established on the appropriate limit to the number of research students that one academic may supervise; six is often seen as an appropriate maximum, provided that there is good back-up support from the research tutor and other academics in associated roles. Knowing that the supervisory role is taken seriously, and is one of the factors when considering promotion, would encourage supervisors to support students in the manner put forward in this book. Overall, making resources available to ensure that supervision is an integral and recognized part of an academic's responsibilities would greatly improve the effectiveness of doctoral education.

Faculty/departmental doctoral research tutor

The role of the faculty/departmental research tutor needs to be supported throughout the university in order to ensure the proper functioning of the doctoral system. This support should allow a considerable amount of the academic's time, say a half, to be devoted to this post with consequent reduction in teaching duties.

There are a variety of titles that may appropriately be used for this role, including sub-dean for research students, convenor of the doctoral programme, and director of graduate studies. We refer in this book to doctoral research tutor. As it is a departmental responsibility to implement this role, its functions and duties are described below.

Training and networking opportunities for supervisors

Training for supervisors to increase their effectiveness is now the norm for new staff, and more experienced academics are also encouraged to attend. Most universities fund sessions to help staff deal with key stages in the management of research degree projects. Universities must make sure that these are available to part-time staff and staff at satellite/overseas campuses. Topics such as the university's guidelines on higher degrees, the role of the internal examiner, ethical issues in research, how to aid students in formulating their research question, and other problems in supervision are commonly discussed. Training in effective interpersonal relations and acting in an assertive, confident manner are also important. Increasingly, institutions are emphasizing that tasks need to be carried out in a humane and respectful way. The fact that mere competence is no longer sufficient should be emphasized in training groups and supervisors' attention should be drawn to it in the handbook. This also provides a gateway into training against bullying and abusive behaviour, as discussed above.

Attending a workshop on improving supervision that is run in a collaborative way enables participants to contribute to the process and so learn from each other as well as from the workshop facilitator.

A well-designed programme would encourage all participants to think about supervision in ways that may not have occurred to them before. This might include different aspects of the role of supervisor with special emphasis given to students' points of view. It could include discussions on some of the aspects of students' expectations of their supervisors that we have been suggesting in this book, together with how to respond to their different needs at different times during their course.

Depending on the make-up of the group and their requirements, other topics might include the specific needs of international students, supervising students with long-term mental health needs and disabilities, or managing joint supervision. As well as giving advice based on research and the practical experience of established supervisors, role-play sessions can also be useful. These might involve learning how to conduct a mock viva or to give constructive criticism, or could even be based around a real issue that someone in the group is currently struggling with – in confidence, of course.

There are many tensions implicit in supervising research students, and a list of questions that may help supervisors think about these is given in Appendix 2. Discussion of these questions could form a useful session during supervisor training.

Institutions should encourage all supervisors, whether new to the role or experienced, to attend at least one such training session because of the considerable benefits to be gained. They will meet other academics from different departments and disciplines of the university and have the opportunity to share experiences. They may well pick up some tips on the

supervisory process and discover that some of their difficulties are shared across disciplines.

The UKCGE (2021) survey identified a lack of opportunities to reflect on supervisory practice. Informal networking events, where supervisors share their experiences across the university, can provide a valuable contrast with formal training.

In conclusion, bad supervision breeds bad supervision, and research students will continue to feel neglected and depressed if their needs are ignored. If, on the other hand, today's universities encourage supervisors to act conscientiously in their work, we will have a contented group of PhD candidates ready to pursue their research and future careers.

Putting in place appropriate regulations

Upgrading and monitoring of students' progress

Almost all universities now have a formal process in place for monitoring students' progress at a number of points during their PhD journey, usually in the form of a written submission by the student, followed by an interview by a review panel. These processes have several valuable functions: reassuring the student that progress is being made, giving the student a sense of the standards that are expected by the institution, providing a wider range of feedback on their work than would be provided by their main supervisor, together with an opportunity to present and defend their work.

We think it important that the university should set up a common procedure for these reviews. Particularly commendable is the model of having an initial review a few weeks into the first year of study. This settles the student into the pattern of having regular meetings and enables them to familiarize themselves with the members of the review panel.

The most important monitoring point is the upgrade meeting, where a student loses their preliminary status as an MPhil student or 'probationer research student' and is accorded full PhD student status. Such recognition will require the presentation of proof of progress and a clear plan for future work, as evidenced by a substantial report and a rigorous viva. This provides good experience in presenting and defending one's work and can also be used as an opportunity to teach and prepare the student for what is ultimately required to obtain the PhD. It is vital at this stage that universities make it clear to any students who are failing to meet the required level. Letting them progress past this stage is damaging to students and supervisors alike. Time will be wasted on both sides, and there is a high likelihood of eventual failure.

Further ideas for monitoring student progress are set out by the Quality Assurance Agency (2018). We recommend that individual universities keep centralized records of student progress and successes, to allow the university to analyse, for example, the comparative progress of different demographic

groups and to assess the impact of policies designed to improve progression and completion.

One area that is currently in need of further attention is monitoring of progress after submission. We would recommend that universities adopt a more rigorous process both in terms of supporting students who have major work to do post viva, and monitoring the various stages in the process. For example, one area where many universities are weak is in the time taken to appoint external examiners, yet this is not picked up by monitoring processes.

Appointment of external examiners

Examiners represent the academic peer group to which the doctoral student aspires. The thesis is the demonstration that the candidate has made a research contribution of a sufficient standard to be admitted and to have the title conferred. The British system attempts to equalize the standards across all universities by requiring at least one external examiner from another institution to be appointed.

It is extremely important to students that institutions approve the appointment of examiners as quickly as possible. A continuing frustration for students is that, after all the work has been completed, they have to wait an inordinate amount of time for the viva. This could, of course, be due to the potential examiner not responding to the request but equally it could be due to administrative delays in the university's higher degrees office.

To maintain integrity, it is important for the regulations to state that external examiners must be in a position to make an independent assessment. There can be a tendency, particularly in disciplines that are relatively small in academic numbers, for the supervisor to propose a professional colleague who may turn out not to have sufficient independence.

Two examples will illustrate the dangers. The first was a proposal that the external examiner be a professor at another university who was intending to make a job offer of a postdoctoral fellowship to the candidate. This would, of course, be conditional on the student passing the degree. In the second case, the external examiner proposed seemed a very appropriate academic in the field. It was purely by chance, since they had different professional names, that the approving committee discovered that he was the husband of the lead supervisor. In neither of these cases was approval given.

The oral examination and beyond

There should be clear regulations and advice to students and supervisors both for the oral examination and for the process of corrections and revisions.

Regulations concerning the viva should include:

- Who is present apart from the student and examiners? Is the supervisor allowed to be present, perhaps only with the permission of the student? If so, is their role that of an observer only? Will there be an independent chair, and if so, what is their role?
- Who is allowed to be an internal examiner? In particular, with the prevalence of team supervision and monitoring panels, is there any restriction on secondary supervisors or progress panel members to be internal examiners?
- Should the viva begin with a brief preliminary talk from the student? Is this compulsory or optional? It can help to put the student's mind at rest, by giving them a few minutes where they are in control.
- The university should decide whether or not departments are free to ask students to give a talk to staff and PhD students across their department before the viva. This has the advantage of celebrating and communicating the achievement of students, but it can be uncomfortable if a student has to resubmit or fails.
- What kind of report is needed on the viva? Should the viva be recorded in case of complaints or appeals?
- If vivas are to be conducted online, what particular considerations need to be put in place? You might find Chapter 10 helpful here.

Beyond formal regulations, the student handbook should explain clearly what candidates should expect from the viva, what they are allowed to take into the viva, how long it will last, a reminder that they are allowed to ask for breaks, what they need to prepare, and a statement as to whether or not there is a formal dress code. This written advice can be usefully supplemented by face-to-face or online sessions where experienced supervisors and successful students share tips and give examples from their experience, to try to de-mystify the viva.

A similar mixture of clear regulations and formal advice is needed for the corrections process after the viva. Typically, the university regulations are clear about the various outcomes and the amount of time allowed before the revised thesis should be submitted. If a university regulates that students are allowed almost no supervision while they are working on their corrections, then this is unacceptable, as they desperately need support during this final phase. Therefore, institutions should ensure that their university regulations provide for this support.

Intellectual property rights

With the realization that knowledge is the key resource in modern society, issues of the ownership of such knowledge are becoming increasingly

contentious. The law of 'intellectual property rights', which attempts to protect the rights of knowledge generators, including researchers, is continuing to develop fast. The proper treatment of the research and writing produced by doctoral students is one aspect of this that is the subject of much debate.

In law, all authors – including doctoral students – are entitled to the copyright benefits from their written and published work. In addition, they are entitled to exert their 'moral rights' of recognition and integrity. Recognition (called 'paternity rights' in law, even if the author is a woman!) means that they are entitled to require to be named as the authors of any writing, including any quotation of their work, and this protects against plagiarism. Integrity means that they are entitled not to have their work changed on publication in ways in which they disapprove.

The first contentious issue is that some universities ask doctoral students, even though they are not employees, to assign their intellectual property to the university. Their argument is that the provision of resources for the carrying out of the research entitles the university to own the output. As it is unlikely that written research material (as distinct from inventions and patents) will generate much income, it would appear to be rather invidious for universities to insist on taking these rights from students. It is pleasing to see that an increasing number of universities are allowing PhD students to retain these rights.

A second issue of contention is that of the appropriate recognition in published papers of the relative contributions of student and supervisor. Should a supervisor be named as joint author of a paper on the basis of carrying out doctoral supervision, even without making a contribution to authorship? Or is an appreciatory footnote the appropriate recognition for supervisory guidance and support? Some departments are placing pressure on research students to include their supervisor's name on journal papers, regardless of whether or not the supervisor has made a contribution to the writing.

In the UK, these pressures have been exacerbated by the Research Excellence Framework, which seeks to assess the research output of universities funded by the government. The regulations for the 2021 Research Excellence Framework (2019) state clearly that 'research undertaken solely by research students is not considered as having been carried out by staff while working in the submitting Higher Education Institution'. A joint paper with a student, however, counts equally as one of the papers that the academic can submit for assessment. Thus if supervisors need to improve their lists, they may insist on joint papers with their names included. How justified is this practice?

There are large variations between the cultures of different disciplines here, as we discussed in Chapter 1. For example, in the sciences the main supervisor may typically have developed a line of study, obtained funding from UKRI based on previous work, and appointed a student to carry out

the designated research. In these circumstances, the argument for joint authorship is apparent. In the social sciences and the humanities, research students often come with their own topics within the field in which the supervisor is expert, and academics give a service of research supervision in much the same way as they give a service of undergraduate teaching. In this case, joint authorship appears less justified, unless the paper is actually jointly written.

Conflict arises when students are unaware of the appropriate conventions and supervisors appear to press arbitrarily for their names to be included as authors. It is important therefore to have a full discussion early in the doctoral research, so that agreement can be obtained on the appropriate practice. The PhD student handbook should contain a section giving advice about authorship practices, with examples from a number of disciplines.

Some universities have established guidelines on such matters. Typically, such guidelines include listing names in order of contribution to the work and that all authors agree on both the list and the order. A further sensible suggestion is that all those listed have the ability to present a seminar on the subject. Given that conflicts may arise, clear guidelines are needed on student recognition. The situation would be eased if papers published by doctoral students were counted in the Research Excellence Framework in their own right.

The PhD in a practice-based discipline

In practice-based disciplines such as art, music or design and technology, there is an ongoing debate on the form of a PhD. Since knowledge is advanced in these disciplines largely by means of professional and artistic practice, an original, creative artefact may be appropriately included as a part of a PhD submission. This is now accepted in most universities.

The debate concerns the extent to which an 'artefact', such as a sculpture (represented, if necessary, by photographs or a videotape) or a musical composition (represented by an audio recording), can be accepted as standalone evidence of a contribution to knowledge and development of the discipline that justifies the award of a PhD. In fact, there is a gradual shift towards the artefact being the main focus of the doctoral research with explanatory text only as a supporting document.

What place do videos, computer programs, crafted objects, and so on have as a contribution to actual research? Currently in the practical disciplines, discussion centres on the extent to which doctoral students should be required to account verbally for their research, rather than letting the finished work (performance, exhibition, composition, etc.) speak for itself.

The accepted approach is to require both artefact and text. The debate centres around what the weighting should be between them. It is usual to insist on a permanent and publicly accessible form for each part of the thesis. The creative part must be fully open to examination by illustration, exhibition

or multimedia presentation. Some argue that the developmental process of the work be made public, perhaps by including all the rough drafts that eventually led to the finished product, thus externally demonstrating the thinking involved. The presentation of this developmental history might even be considered acceptable in lieu of an analysis in words.

However, institutions require that, in addition to the creative component, students must show that they have a theoretical as well as a practical understanding of their area. They must be able to provide a rationale for the work undertaken. If there has been no previous academic work in the field, then it is incumbent on candidates to cite relevant thinking from other areas or to espouse a specific theoretical approach. In addition, the project needs to be set within a larger context involving current issues. It is important to demonstrate how the research being presented expands on what has already been done. This contribution could change previous work by using different materials or develop it with new tools. As reported in Chapter 5, to date, we know of no institution that accepts a completed artefact without any supporting written document.

Departmental responsibilities

Departments are a key factor in successful doctoral education. Senior academics should be considering the department's role in terms of the following questions: How are departments helping their postgraduate students to learn and to succeed in their research? What strategies have been introduced to enable students to learn from people other than their supervisors? Have self-help groups or buddy systems been established to assist students in learning from one another? Are arrangements in place for students to develop their conceptions of what constitutes excellent research in their discipline and their role as researchers?

The departmental research tutor

Each department should ensure that they receive resources to establish a research tutor role. Tutors should have this administrative responsibility formally recognized as part of their overall workload.

If a lecturer is appointed, this has the advantage that students perceive the research tutor as accessible. This is important because small problems, if confronted at an early stage, can be prevented from erupting into major difficulties that threaten the very continuation of the student's studies. If a senior lecturer or professor is appointed, there is a real probability that students will hesitate to go to the research tutor with their concerns.

The problem when the tutor is a lecturer is in ensuring that all members of the department take the role seriously. This is vital for the role to be

effective because there will be times when the research tutor takes issue with senior colleagues about their treatment of one of the research students. The appointment of a senior member of staff as research tutor recognizes the importance of doctoral education in the work of the department. There are fewer problems of status in acting on behalf of a student but more problems of approachability.

There are a number of tasks for the tutor to carry out. In order to ensure that at least one person has an overall picture of the students entering the department, the tutor should be involved in all applications and acceptances. The maintenance of standards requires that all students be interviewed. The tutor, either in person or by nominating a colleague, should participate in the interview process.

The research tutor should take an active role in monitoring the progress of research students. In a small- or medium-sized department, the tutor could chair all of the progress panels, to allow consistency of standards across the department and so that examples of good practices are disseminated across supervisory teams. This means that the research tutor becomes very experienced in the actions that follow monitoring meetings, such as counselling a student, supporting a supervisor, and negotiating with a colleague. This also gives the research tutor wide experience of how the process works, so that they can communicate ideas about improving the progress monitoring system. One way to make this manageable is to have the progress monitoring sessions at specific times during the year, so that the research tutor's schedule is not overwhelmed. In a larger department, a number of panel chairs might need to be appointed, and regular communication with the research tutor maintained. In most universities, there will be an institution-wide system for progress monitoring, but some might delegate the details to each department, in which case it is the research tutor's duty to implement a sensible system.

An important but delicate aspect of the tutor's work is the monitoring of the relationship between the student and the supervisors in order to ensure that it develops well. This covers the ability and motivation of the student and the interest and commitment of the supervisors. The tutor may have to act as a conciliator or arbiter when interpersonal conflicts occur.

Another role that the research tutor plays is to manage the transitional process when a supervisor leaves the university, or where the relationship between the student and one or more members of their supervisory teams breaks down. In the latter case, we provide substantial advice (Chapter 6), which could be used as part of training new research tutors in how to handle this delicate situation. Where a supervisor leaves the university, there are two main issues. First, if the supervisor is moving to a new university, will the student follow them? Second, if the student stays, what support is in place to move to a new supervisor, and how is it decided who this new supervisor will be? The institution should have clear guidance to support the research tutor in making these decisions.

The tutor will need to liaise with supervisor colleagues to ensure that there are sufficient resources provided to back up the proposed research. These might include, for example, equipment and the cooperation of a lab technician. Help in obtaining access to fieldwork sites, such as schools or industrial organizations, may be given.

An important task of the tutor is to interpret the university guidelines, as discussed above, concerning the upgrading to full PhD status and other monitoring points. This requires a consistent standard to be maintained, which is communicated to all students so that they are aware of what is required of them. When there are different practices in operation, students understandably become extremely anxious about whether or not they will be upgraded. This can inhibit their ability to study.

It is good practice, therefore, for all new students in the department to have an opportunity to discover what a PhD looks like. They should be required to read and evaluate recently accepted PhD theses in order to understand what it is they are aiming for. If asked to do this on their own, students often emerge from the document depressed, and convinced that they will never be able to write anything even remotely resembling it in either length or quality. Being asked to carry out a task, in pairs or small groups, helps students to come to terms more easily with what is required. Such a task should include:

- a summary of the research – one always has to set out what is being criticized before being able to deal with the criticism;
- a description of the contribution of the research and why they believe the examiners decided it was worthy of the PhD degree;
- a clear understanding of the criticisms of the work and any inadequacies, which would lead them to do the study differently.

This analysis should be presented in a departmental doctoral seminar, so that students may begin to acquire the confidence of presenting their ideas to others for feedback. It also begins the process of enabling students to feel that the task they are undertaking is something of which they are capable.

The research tutor must become an expert in the administrative arrangements needed for submission and examination of the final thesis. The tutor is then in a position to help colleagues who deal less frequently with this stage of the process. Finally, the research tutor has a major part to play in all the activities described in the following sections.

Improving the selection of students into the department

Selection of students into the department is very important indeed and should be carried out systematically. In order to widen the pool of possible applicants, we suggest that there should be a special open evening for

research students at which prospective supervisors talk about their research interests and the facilities that can be offered. This could be an online event, allowing students from around the world to attend.

All departments are looking for students who have the potential to be successful in completing their research and writing their theses to the required standard within given deadlines. While training in admissions selection is now mandatory for all institutions, we know that we are not very good at selecting research students who will be successful. Selection would be improved if a wider range of characteristics were to be taken into account. For example, degree classification should not be taken as the only indicator; special weight should also be given to performance in undergraduate student projects and master's dissertations. There is value, too, in allowing success on extended projects outside the degree, such as summer research internships, to compensate for weaker performance in exam-based modules. It should be recognized, however, that not every student has the opportunity to dedicate time to such activities.

In addition to interviewing, classic tests of problem-solving and flexible thinking should be considered. The aim of such tests is to diagnose creativity and the approach that the applicant takes to solving problems. The correctness of the answer is only of secondary importance in identifying research potential. These procedures should also include a personal interview, either face-to-face or online.

A short test of writing in academic English is also an effective aid to selection. Asking applicants to summarize a research report, a published paper, or to read and précis an article in a newspaper while in the presence of the member of staff (to ensure that it is their own work) is a way of ascertaining that they have the necessary command of the written language to commence study. When graduates with a PhD from a British university demonstrate to their new employers that their command of English and their ability to express themselves professionally is not up to expectation, confidence in our universities is undermined. This leads to fewer applicants over time and may well be a false economy.

An additional problem with the increasing number of research students is a tendency in some departments for them to be allocated to supervisors. This is a trend that should be avoided. Academic staff should have the full support and encouragement of their department to be involved in the selection of their own research students. Regardless of any prior contact, each applicant should be interviewed by any potential supervisors and another member of the academic staff of the department, usually the research tutor. Engaging supervisors closely in the selection process also helps to avoid the problem where students are accepted more for reasons of income than because of their research potential.

The procedures might also involve a formal research proposal together with some evidence of having knowledge of the subject area. Some

departments insist that no new student be accepted without a clear-cut research proposal. Some consider the research proposal to be more suited to the upgrading procedures once the student has been working for a year or more towards the research degree. Other departments do both, one at the beginning and a more mature proposal at the end of the first year.

There is no reason why we should expect PhD students to be in a position to write acceptable research proposals prior to receiving any training. In fact, it is unlikely that a well-constructed research proposal would be possible before the student has spent some time developing the necessary skills in a research environment. Therefore, if institutional regulations require it at the time of entry, applicants will probably need some help in preparing the proposal from a member of staff of the department they are hoping to join. In addition, some guidance on which aspect of a topic is likely to be looked on favourably by a particular member of staff would make sense at this stage.

If the applicant is able to provide a proposal at the time of the selection interview, it is of great assistance to the staff making the decision whether or not to offer a place. The proposal would allow the selectors to ascertain whether there is anybody available and willing to supervise the specific topic, and whether the applicant is aware of what is involved in constructing and conducting the research and has sufficient background knowledge to commence work at the level required.

Selection of supervisors

An important departmental responsibility is the setting up of adequate criteria for the selection of supervisors. There are two factors involved, and they do not necessarily correlate: first, the academics' past experience of research and present level of research activity in the chosen field, and second, their past experience of supervision and present degree of commitment to the supervision of research students.

Ideally, only supervisors who are high on both aspects would be selected – and even then they would normally require some training to be fully effective. The fact that the supervisor is an enthusiastic and successful practitioner of research, and is seen to be so, is a very important input to the successful completion of the PhD by the student. Students who experience their supervisors as being very involved in non-research activities – teaching, administration, policy, consultancy – at the expense of doing research, very soon come to devalue their research work and are less likely to complete. Active researchers are also necessary to give the contemporary professional knowledge and skill that PhD students need to acquire.

Experience of supervision to successful completion of the student's PhD is such an important factor that at least one of the supervisors must have achieved this.

Guidelines on appropriate supervisory behaviour

Universities should ensure that it is departmental policy to provide guidelines on the expectations of supervisors, which may be established across the university, and should stipulate:

- the maximum number of students that a supervisor may supervise (in particular as a lead supervisor);
- the maximum amount of time a member of staff might reasonably be expected to take to respond to written work presented by the student (as recommended in Chapter 6);
- that research students and supervisors agree how their working relationship will function, including the minimum number of meetings per annum (as recommended in Chapter 6);
- that the student be informed of relevant university and departmental regulations and administrative requirements in good time for them to be adhered to;
- that the student be provided with early information regarding satisfactory or unsatisfactory progress;
- that supervisors introduce their students to a variety of people and ideas within the academic community;
- that advice be given on ethical and welfare issues and how to overcome related difficulties;
- that supervisors refer their students to these guidelines and any other official documents relevant to their status as postgraduate research students.

In addition, the research tutor should work to encourage the good supervisory practices described in Chapter 11.

Support groups for research students

The context in which students are working is vitally important. The aim must be to establish a 'research-rich environment' where students can gain both academic knowledge and personal motivation from the encompassing research activity. Departments should ensure that their research students are not suffering from feelings of loneliness and separation from their peers in addition to any family or friends in order to conduct their research. Non-completion has as much to do with feelings of isolation and alienation as it has to do with any lack of intellectual ability. Support and encouragement from fellow doctoral students helps to alleviate these persistent problems.

For these reasons, departments should make it easy for their students to meet regularly with others in their situation. The research tutor needs to set up meetings for research students so that they have a feeling of belonging to the university and are able to develop a sense of identity as a member of

a research community. The timing of these events should take into account part-time students, students with children, etc. For example, events could be held at different times of the day/week, so that all students get to attend some of them. As well as face-to-face meetings, this could also include setting up an online forum. This entails accepting demands on them as individuals to perform and to conform to deadlines.

Research students have to be constantly reminded that they are not working in isolation and that there are people who are interested in their work and their progress. This will help to develop their commitment. A contributory factor to non-completion is the belief by students that they wouldn't be letting anyone down if they decided not to continue. But this is not the case, as they would be letting the department and the university down. Indeed, if they have external funding, the university would be penalized because of their non-completion.

By ensuring that students meet their peers, departments can help them to discover that they can help themselves and others in a variety of ways. Given gender and cultural differences in communication and debate, however, it is very important that departments consider ways of introducing self-help groups in such a way so that the groups are appropriate for all students.

This chapter has addressed some of the issues that we consider vital to the survival of the PhD as a constantly evolving system. At a time when academic policy-makers are seriously trying to improve this aspect of higher education, it is crucial that policies be defined that work to the advantage of the whole system.

Conclusion

The ideas in this book are all based on systematic study and practical experience, over many years, of the PhD in operation. Taken as a whole, they form the basis of a coherent reappraisal of the system and thus make a contribution to the developments currently being introduced. As well as improving the quality and completion rate of doctorates, these policies would greatly improve the experience that individual students have of actually doing a PhD.

Appendix 1

Self-evaluation questionnaire on research student progress

This questionnaire has been designed as a tool to allow you to consider realistically your own personal situation as a doctoral student. The items have all been stated positively so that ideally each one of them should be marked 'Strongly Agree' (SA). Those items that are not marked SA or 'Agree' (A) act as pointers to a diagnosis of what could be improved in your situation. After first completing the questionnaire individually, it would be sensible for you to share your diagnosis with fellow doctoral students in order for you to help each other to work on strategies and tactics for improvement.

In order to focus your views on your progress towards a PhD, please give your opinion on the statements below. As you go through the questionnaire, please list on a separate sheet the reasons for your opinion. This sheet then acts as an agenda for you to work on, to improve your progress.

SA = strongly agree
A = agree
U = undecided
D = disagree
SD = strongly disagree

My progress

P1 I am fully committed to getting my PhD whatever the problems I encounter.

SA A U D SD

P2 Under no circumstances will I take a new job before finishing my PhD.

SA A U D SD

P3 I understand clearly the standards that I will be required to achieve in my thesis.

SA A U D SD

P4 I am confident that I can make 'an original contribution to knowledge' in my thesis.

SA A U D SD

P5 I have a plan for my work which I stick to, and so can evaluate my progress.

SA A U D SD

P6 I regularly set myself realistic deadlines and achieve them.

SA A U D SD

P7 My research work is directed towards making a contribution by having an argument to maintain (i.e. a thesis).

SA A U D SD

P8 I take every opportunity to produce written work (reports, draft papers, draft chapters) in order to improve my writing skills.

SA A U D SD

P9 Overall, I am satisfied with my progress towards the PhD.

SA A U D SD

Support from my supervisor

S1 My supervisor is an experienced researcher with a good knowledge of my research area.

SA A U D SD

S2 I am confident that my supervisor understands the level of work required for a PhD, and neither under- nor overestimates it.

SA A U D SD

S3 I am in regular contact with my supervisor, who is always available when needed.

SA A U D SD

S4 I get a great deal of help from my supervisor, who is friendly and approachable.

SA A U D SD

S5 My supervisor always reads my work well in advance of our meetings.

SA A U D SD

S6 My supervisor has not 'taken over' my research, but allows me to develop it independently.

SA A U D SD

S7 I am always punctilious in keeping appointments with my supervisor.

SA A U D SD

S8 My supervisor is equally punctilious in keeping appointments with me.
SA A U D SD

S9 I have a good friendly relationship with the departmental secretary which helps to keep me in contact with my supervisor.
SA A U D SD

S10 Overall, I am well satisfied with the quality of supervision that I am receiving.
SA A U D SD

Support from my department

D1 The department provides adequate physical and financial resources for my research (e.g. lab or other working space, equipment, library access).
SA A U D SD

D2 The department provides opportunities for research students to meet and receive support from each other and I have taken advantage of them.
SA A U D SD

D3 The department provides a stimulating seminar programme for doctoral students to which I contribute.
SA A U D SD

D4 The department provides opportunities for good professional contact with academic staff which I have taken up.
SA A U D SD

D5 The department provides opportunities for social contact with academic staff which I have taken up.
SA A U D SD

D6 The department encourages and supports attendance at conferences and other academic gatherings which I have taken up.
SA A U D SD

D7 The department organizes meetings to discuss the nature of the doctoral process and the relevant university regulations applying to my research work which I have attended.
SA A U D SD

D8 Overall, I am satisfied with the support I receive from my department.
SA A U D SD

Appendix 2

Self-evaluation questionnaire and topics for discussion on doctoral supervisory practice

This questionnaire has been designed as a tool to allow you to consider realistically your own personal situation as a doctoral supervisor. The items have all been stated positively so that ideally each one of them should be marked 'Strongly Agree' (SA). Those items that are not marked SA or 'Agree' (A) act as pointers to a diagnosis of what could be changed. After first completing the questionnaire individually, you might like to share your diagnosis with fellow supervisors about issues that need addressing.

Self-evaluation questionnaire on doctoral supervisory practice

In order to focus your views on doctoral supervision, please give your opinion on the statements below. As you go through the questionnaire, please list on a separate sheet the reasons for your opinion. This sheet then acts as an agenda for discussion.

SA = strongly agree
A = agree
U = undecided
D = disagree
SD = strongly disagree

My supervisory role and practice

R1 I give my students support, encouragement, and stimulation.
SA A U D SD

R2 I have a 'research active' career, including publications, to be a role model for my students.
SA A U D SD

R3 I am able to devote sufficient time to supervise my students adequately.

SA A U D SD

R4 I meet my students regularly to discuss their research projects.

SA A U D SD

R5 I have ensured that my students have easy access to me.

SA A U D SD

R6 I have established a 'weaning process' to encourage my students to increase their independence over the period of the project.

SA A U D SD

R7 I am able to read and consider students' written work well in advance of tutorial meetings.

SA A U D SD

R8 I consider how to structure tutorial meetings with my students to improve the flow of communication.

SA A U D SD

R9 I am able to give effective feedback to my students.

SA A U D SD

R10 I am able, where appropriate, to maintain eye contact while commenting on students' work, or otherwise demonstrate my interest and engagement.

SA A U D SD

R11 I am able to be 'constructively critical' when commenting on students' work.

SA A U D SD

R12 I comment on all sections of written work presented by my students.

SA A U D SD

R13 I assist my students to select and develop a promising topic for research.

SA A U D SD

R14 I acquaint my students with the latest relevant research publications.

SA A U D SD

R15 I encourage my students to make critical use of published work and source materials.

SA A U D SD

R16 I assist my students in making critical use of published work and source materials.

SA A U D SD

R17 I give guidance on thesis writing as well as thesis content.
SA A U D SD

R18 I help the student to understand the concept of 'originality' as it is applied in the topic researched and the methodology employed.
SA A U D SD

R19 On topics on which I am not an expert, I ensure that my students obtain appropriate advice from others.
SA A U D SD

R20 I am always present at my students' public presentations about their research and give feedback on their performance.
SA A U D SD

R21 I review and give feedback on the draft of a completed thesis prior to submission.
SA A U D SD

R22 I advise and assist on students' publications that might flow from the thesis.
SA A U D SD

R23 I demonstrate interest in my students' subsequent careers and am willing to help further them.
SA A U D SD

Topics for discussion

Conflict is inherent in the role of supervisor, which means that you will frequently find yourself faced with dilemmas. Although implicit, these tensions are there in supervision and need to be confronted. This section of the questionnaire is aimed at helping you to recognize and work out how best to handle these tensions. You may find some of the questions easy to answer and feel that the issue being considered is not a problem for you. But other questions may be more challenging.

Here are some topics for you to think about; discuss with colleagues or just use as a self-help guide.

Resolving the conflict – which of these is true for you?

C1 Do you always achieve your goals when commenting on students' work or do the students persuade you to their point of view?

C2 Do you experience tutorials with your student as a rewarding encounter or a frustrating meeting?

C3 Do you perceive yourself to be an interested reader of your students' drafts or a detailed copy editor?

C4 Do you consider yourself to be supervising the student or supervising the research?

C5 Do you believe that supervisors should terminate supervision if they think the project is beyond the student or support the student until the thesis has been submitted regardless of quality?

C6 Should supervisors assist in the actual writing of the dissertation if the student has difficulties, or be very wary of contributing too much to the dissertation?

C7 Are you of the opinion that staff–student relationships are purely professional and personal matters should not intrude, or that close personal friendships are essential for successful supervision?

C8 Is it more important for supervisors to initiate frequent meetings with their students or for students to decide when they need tutorial meetings?

C9 Do you think that supervisors should be available to help students with all problems that arise during the course of study, or that they are not trained counsellors and should not attempt to be all things to their research students?

Appendix 3

Examples of first approaches to prospective supervisors

This appendix gives three examples of the first approach that could be made to prospective supervisors. The first two are in the form of emails; the third is a short form of a research proposal that might, for example, be used as part of the application form for a PhD programme.

Example 1: A student with a clear project in mind

Dear Prof. Cattermole,

I am currently preparing applications for PhD study in the 2022/23 academic year, and I was wondering if you would be interested in being my supervisor. I recently read your book concerning 18th century house building, and aspects of your approach, based on careful analysis of builders' and suppliers' tax records, was of particular interest to me. The topic that I propose to study in my PhD is ship building in the similar area, and I propose to use a similar method to yours in analysing the financial records held at the Admiralty during that period. This will build on my MA dissertation from 2017 where I analysed naval pay records. I hope that you would be interested in talking further about this. Please do let me know if this would be of interest to you, and perhaps we could talk further before I prepare my formal application?

Good wishes,

Camilla Chappell

Example 2: A student with broader interests looking for a project

Dear Dr Jankovic,

I am currently preparing applications for PhD study in the 2022/23 academic year, and I was wondering if you would be interested in being my supervisor. I see that you have published widely in the area of non-linear dynamics, and became particularly interested in this area during a final year module in this subject, as I found that it allowed me to connect

various areas of mathematics that I had studied earlier in my degree, in particular connecting areas of analysis and topology that had previously seemed to be distinct topics. I was wondering if you had any ideas for projects in this area that you would recommend, and if so, whether you would be interested in talking further about this.

Good wishes,

Julian Jefferson

Example 3: A proposal summary for a practice-based programme

For my PhD, I propose to develop my practice in the area of improvised music by creating a number of performances that involve interaction between performers and audience members.

This will build on my previous practice and on my previous studies. I have been a piano and voice performer in the free improvisation tradition for the last fifteen years, working with a number of groups, in particular the Rummidge Improvisation Collective. This has given me a deep understanding of the practice of improvised music in this tradition. My academic studies consisted of a BA(2:i) in Performing Arts at the West Midlands University, where I was awarded a Dean's Prize for the best practical performance in my year, and an MA (merit) in music from the Royal Rummidge Academy, where I specialized in piano performance.

A key motivation for doing a PhD is to develop my practice in a way that is more strongly informed by the theoretical frameworks that have been developed in the last couple of decades for understanding improvised music. In particular, I am interested to explore whether Lewis's theory of multidominance [1], and Borgo's links between collective improvisation and ideas of chaos, complexity, and actor-network theory [2] can be used to underpin new forms of interaction between performers and audience. I will also explore how the ideas of Kimmel and Hristova [3] on co-creation between performers can be extended to examine co-creation between performers and audience.

My plan for my PhD study is to develop these ideas through a number of performances. Each of these will be informed by my theoretical readings, by discussions with audiences and fellow performers, and by personal reflection on my performance practice. They will be documented via a combination of video recordings and performance materials, which will be included in my PhD submission. I have good contacts with the Midlands New Music Festival, which will provide me with regular performance opportunities.

I envisage my final submission to consist of the documentation of a number of these performances, together with a reflective document in which I take each performance in turn, and discuss how that performance was designed based on reflections on previous performances and my theoretical

readings. This document will also contain the results from a number of interviews that I will carry out with audience members following one of the later performances.

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