Understanding Teaching-Learning Practice

John A Bowden
Pamela J Green

Playing the PhD Game with Integrity

Connecting Research, Professional Practice and Educational Context

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Understanding Teaching-Learning Practice

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For Mary (JB)
For Brit and Dylan (my PhD babies) (PG)

Preface

One function of a Preface is to provide some insights into what the authors were thinking about when they conceived the ideas for the book. For us, there were two dimensions to our thinking—the external need for serious debate about integrity in the PhD system and our own internal motivation to further unravel and critically reflect on some of the doctoral issues that we have been dealing with, both as researchers and as teachers, in recent decades.

A question we have been asked by some who heard about our book is whether we see PhD candidates as lacking integrity; is this what motivated us to write the book? In fact, the direct opposite is true. Between us, we have supervised over 40 successful PhD candidates, using qualitative approaches and mixed methods, and we have continued to supervise and advise PhD candidates up to and throughout the writing of the book. We do believe that there is a need for serious debate about integrity in the PhD system. However, our reasons for writing this book do not include a perception of any growing malevolent purpose among doctoral candidates. Rather, we see such candidates struggling within overly complex PhD systems that threaten to stifle their goal of becoming ethical researchers, mostly by neglect, indifference or unbalanced prioritisation, rather than by design. In our view, those system deficiencies arise because integrity in decision-making is not always as prominent an issue as it should be across the system. Hence, this book is focused on integrity in the PhD system, both in relation to its structure, principles, rules and processes, and also in relation to the decision-making by various individuals within the system. These do include candidates and supervisors, but also involve senior academics and managers, university executive members, policy makers, relevant state government bodies, national government departments and agencies, as well as the governments and politicians themselves. All of these participants in the PhD system influence the experiences of PhD candidates and their outcomes in various ways; our development of a moral compass framework is directed towards an ethical framework for the PhD system that optimises ethical behaviours and moral outcomes, by all and for all.

While our practice-based research has had a primarily qualitative focus, one of us brings a science background to the task (Bowden's PhD and university teaching in chemistry, as well as a Dip. Ed., and teaching and research experience, in university pedagogy) and the other a social science background (Green's PhD in literacy and sociology, and a wide range of teaching experience from primary school, to university undergraduate teaching, to PhD supervision and research management of graduate education). As experienced researchers within graduate education and as providers of research training at university level within Australia and internationally, we write about the PhD system on the basis of our knowledge, skills, experience, research and publications, related to graduate research education. Throughout our academic lives, each of us has experienced the joys as well as the challenges associated with learning to do research, through our own PhD experiences and also through supervision of the work of a range of postgraduate research candidates over four decades, more recently as joint supervisors. We have been impressed by the commitment and focus displayed by the candidates with whom we have worked, given that most of them have sincerely sought to act with integrity. Our aim with this book is to encourage all members of the PhD system to reflect on their own actions and ensure that they go forward in ways that address integrity perspectives more consciously and more directly. By doing so, they will make positive contributions to the experiences of PhD candidates and their development of research integrity.

Let us now address our own personal motivation for writing this book. *Playing the PhD Game with Integrity* did not come out of nowhere. The book is grounded in our practice-led research on doctoral work, such as projects about our moral compass framework (MCF); moral development, moral advocacy and moral mediation; the nature of capability; completion mindsets and completion contexts; supervisor–candidate relationships; and joint authorship of research publications. Consequently, the outcomes presented in the book are practice-determined and some of the chapters are based on papers we had previously published on those topics (mainly Chaps. 2–5). However, in transforming that material into chapters, we found ourselves asking new questions and rethinking previous ideas, with the book theme as the anchoring perspective. This also led to additional chapters (Chaps. 6–11) on new topics, some of which were not part of the original book proposal submission. That was because, as we forecast to the publishers, the very process of writing, especially in a joint authorship project, almost always results in the creation of new knowledge. In Chap. 9, we analyse joint authorship as a knowledge creation process and provide a theoretical explanation for why we discovered new ideas through the writing of the book. That explanation involves both agreed mutual roles in playing devil's advocate constructively and the intellectual clash between our different academic backgrounds. The combination of both contributed to making the joint writing process a learning one for us and the creation of new knowledge for readers.

The task we then faced was to tie the various aspects, both old and new, together. In order to take a holistic stance and to ensure coherence, we focused on connections between the nature of doctoral work; disciplinary and methodological

contexts; the structure of, and range of roles within, the PhD system; doctoral research processes, practices and outcomes; and consequences for professional practice.

What is our target audience? Simply put, our target audience is the wide range of people and organisations that form the PhD system. In essence, the book is both about them and for them. Candidates and supervisors are directly engaged in the learning process aimed at the candidate becoming an ethical researcher. That process is enhanced by a broader knowledge of the nature of research integrity and how it is best developed while learning to be a researcher. That includes the relationship between candidates and supervisors. Our book addresses such issues in detail. Throughout the learning process, both candidates and supervisors interact, either directly or indirectly, with a range of other people throughout the PhD system whose decisions and actions affect the candidate's experiences and outcomes. Our book is also directed, therefore, to senior academics and managers working to treat candidates fairly while encouraging efficient progress, and within both formal and implied contractual agreements. The latter can involve such resources as the provision of a safe space for experimentation, failure and new learning, as well as the existence of an intellectually stimulating environment. This book examines all of the above aspects in relation to system integrity.

University executive members are often torn by potentially incompatible responsibilities, such as financial viability and quality outcomes, and consequently wrestle with inherently difficult decisions. The need to make a profit and to enhance the standing of the university can often lead to over-enrolment within a PhD programme, in relation both to available infrastructure resources and the capacity of current academic staff to provide quality supervision to higher numbers of PhD candidates. Such conflicts of responsibility are directly addressed in this book in relation to the concept 'wicked problem'. The book provides a useful framework for such decision-making.

Our book is also relevant to personnel in a range of state government bodies, national government departments and agencies, the governments themselves and politicians. In their various roles related to PhD programmes, normally focused on local or national needs, fiscal responsibility and quality issues, they can make apparently logical decisions that, in fact, adversely affect the experiences and outcomes of PhD candidature. Decisions shaped by cost-saving, for instance, can lead to diminished PhD outcomes and lowering of quality. This is another example of a wicked problem. In this book, we argue for mechanisms that address such responsibility clashes at government level.

As we were writing the book, it became apparent to us that many of the integrity principles we were writing about had relevance beyond the PhD system and research integrity per se. We were observing, on social media and in newspapers, reports of behaviour that clashed with the integrity principles that we espouse. Consequently, the last chapter emerged with a focus on the PhD graduate in the professional workplace and analyses their roles in behaving professionally with integrity.

A contrast is made between that ideal behaviour arising from learning to play the PhD game with integrity and the behaviours we observe in the media that seem to defy or even deny integrity principles.

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Contents

Chapter 1
'Playing the PhD Game' with integrity: An overview

Abstract The notion of 'playing the PhD game' introduces the main focus of the book: on working towards success, with integrity, within the PhD system. The nature of integrity, a significant thread throughout the book, is unravelled. The main motivations behind writing the book are presented in terms of research integrity and standards of research practices and outcomes. The ways of working of key participants, such as candidates, supervisors and university managers, are central to achievement of goals within the PhD programme. Such behaviours, at both individual and collective levels, are key to ethical decision-making, progress towards success and the overall integrity of the PhD endeavour. The main tasks of the PhD challenge, seen through the lens of integrity, and what this means for coherence within all elements of the PhD game, are introduced. This chapter launches the key constructs of the book, in particular, our moral compass framework (MCF) for professional integrity. Notions of collective morality, decision-making when faced with 'wicked' problems, connected moral capability, as well as completion mindsets and contexts inform the practice-based elements of the book. What such notions mean for the conduct of doctoral research, research supervision, academic writing practices (PhD and publication), joint authorship and research training support systems are outlined (and developed in subsequent chapters). An overview of the key constructs within the book is presented as a map to guide the reader. Finally, the changing nature of the graduate research education landscape is presented, from the origins of the PhD to the increasingly complex context within which the PhD game is now played.

1.1 Introduction

This book is about how candidates can work for success within the PhD system and do so with integrity. It addresses the activities of individuals, and the professional and social principles on which their actions are based. It also involves the integrity with which the system as a whole operates. Hence, within the PhD system, it examines the nature of individual ethical behaviour for candidates, supervisors, university managers and academic staff, government personnel, relevant politicians and examiners. It explores the relationship among all of those and develops a framework to bridge the individual and the collective. The failure of any part of the system to operate

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with integrity has a consequential impact on the achievement of the goals of the PhD system and its members. At times, the impact of such integrity principles beyond the PhD system is explored, no more so than in Chap. 11.

Throughout the chapters of the book, the key issues are explored in relation to explanatory frameworks that guide appropriate behaviour; notions of moral development within a connected system; maintenance of integrity under time and work pressure; decision-making in research and research training; and writing research documents, both as a single author and in collaboration with others. Finally, the lessons learned from this exposure of the PhD system to ethical scrutiny are applied to wider personal, social, business and political contexts throughout the world.

In the process, 14 constructs that one or both authors have created, and previously reported in refereed publications, are used to develop the argument in the book. Eight constructs reported by other authors are adapted to contribute to the theme. In the process of writing the book, the authors have in addition created six new constructs. All 28 constructs are listed in Sect. 1.6 of this chapter. Further, their relationship to each other and to various aspects of the PhD system is illustrated, along with a table showing where in the book each construct is most relevant.

1.1.1 Why write this book?

The motivation to foster integrity in the PhD system emerges from the importance of ensuring that candidates are given a fair opportunity to have a successful and fulfilling PhD research experience, and their future need, when joining the research community, to be suitably equipped with an ethical professional attitude and associated capability to engage in research with integrity. These issues will be explored in detail throughout this book.

There is another motivation. To the extent that research integrity across the world at any given time is less than it should be, there is considerable value to the research community in encouraging new members who are capable of raising the standard of research integrity among their professional peers. This could be a significant factor because there is evidence that research integrity across the world may be at risk. It is important that the next generation of researchers has the will and capability to help raise integrity standards. This book is about the intersection between integrity in the PhD system and research integrity. Our interest in integrity in research is in terms of that contextual relationship.

In 2017, the National Academies of Science, Engineering and Medicine in the USA made the following statements in a report on '*Fostering integrity in research*':

> Serious cases of research misconduct—including some that have gone undetected for years—continue to emerge with disturbing regularity in the United States and around the world. Increases in the number and percentage of research articles that are retracted and growing concern about low rates of reproducibility in some research fields raise questions about how the research enterprise can better ensure that investments in research produce reliable knowledge. (National Academies of Science, Engineering and Medicine 2017, p. ix)

For example, Buckwalter et al. (2015) reported that, since 1975 in the field of orthopaedic research, there has been a tenfold increase in the number of journal articles that have been retracted. The academies' report concludes that "failing to define and respond strongly to research misconduct and detrimental research practices constitutes a significant threat to the research enterprise" (National Academies of Science, Engineering and Medicine 2017, p. 2).

Edwards and Roy (2017) posit an explanation for such an observed decline in research integrity. They attribute the reduction in ethical standards to what they term a "perverse academic culture" comprising "perverse incentives" and hypercompetition (pp. 51–52). They attribute the perverse incentives to the increasing use of quantitative measures of research productivity (in some situations called performance indicators), "including publication count, citations, combined citation-publication counts (e.g., h-index), journal impact factors (JIF), total research dollars, and total patents" (p. 52). There are, in their view, consequences and "because these measures are subject to manipulation, they are doomed to become misleading and even counterproductive" (p. 52).

Elton (2004), while assessing the deficiencies in the use of such performance indicators (PIs) for research, referred to Goodhart's law,

> which states that 'when a measure becomes a target, it ceases to be a good measure' (from McIntyre in a BBC programme in 1999). The basic reason for this is that PIs, when used for control, are unreliable: they do not measure performance itself, distort what is measured, influence practice towards what is being measured and cause unmeasured parts to get neglected. (Elton 2004, p. 121)

Edwards and Roy (2017) claim that a continued overemphasis on quantitative metrics "will pressure all but the most ethical scientists, to overemphasize quantity at the expense of quality, create pressures to "cut corners" throughout the system, and select for scientists attracted to perverse incentives" (p. 53).

Such unethical research practices include fabrication, falsification and plagiarism. The references quoted in this section provide a range of examples. One example of falsification relates to the 1998 report in Lancet by Wakefield and 12 other co-authors on, among other falsified findings, a link between childhood vaccination and the onset of autism. The evidence in their report has been shown to have been altered, to skew the conclusions in favour of financial sponsors, and a range of follow-up research projects has refuted the reported link between vaccination and autism [see Buckwalter et al. 2015, e2(2)]. Yet, despite retraction of the article by the journal Lancet in 2004 and 2010, and subsequent contrary research findings, the effects of that falsified research are pervasive. There has been intense political and social dispute in various countries about the safety of childhood vaccination, a concern that owes its origin to that falsified research (Davidson 2017). The issue of concern here is not whether there is (or is not) a link between vaccination and autism. Rather, it is the fact that the 1998 research findings were falsified and that they influenced community responses in both the short and the long terms. Discovery and exposure of unethical research do not necessarily solve the problems in society that the fraudulent practice has generated. It is necessary to stop such unethical practices from occurring at all.

Ensuring that PhD graduates enter the research profession with a commitment to professional integrity is one important factor.

It might be argued that such falsified research reports are rare but, while that is debatable, there are other sinister practices that, in the context of perverse incentives and hypercompetition, have become commonplace. By becoming commonplace, they have changed the nature of research and the perspective of researchers on research integrity for the worse. Instances of a researcher publishing the same paper more than once, albeit with slight variations, and the breaking up of what should have been reported in one paper into several smaller papers are examples elaborated by Elton (2004). He adds: "This goes beyond Goodhart's law by amounting to 'playing academic games' and even sharp practice. This 'playing of games' is perhaps the most demoralising feature of PIs, as it leads to an active discouragement of professional standards" (p. 122). These practices fail to address the 'big picture' and in turn distort research goals and project planning. Society is the victim, as its research funding is used more to further the career ambitions of researchers within that perverse culture than to address world problems more comprehensively.

The various quantitative measures (or PIs) play a role in a range of decision-making in universities about academic appointments, tenure, promotion and research funding, as well as awards and honours. Given the decreasing number of career academic opportunities, the reduction in research funding and the shift of university management systems towards a business model based on profit, individuals face a hypercompetitive market governed by these perverse incentives. There is a strong temptation to comply and that brings with it the doubtful ethical behaviour discussed above. This is not restricted to individual researchers or universities. Edwards and Roy (2017) suggest that government agencies are also subject to perverse incentives and hypercompetition, giving rise to a new phenomenon of institutional scientific research misconduct (p. 55). Edwards and Roy are also scathing about the use of university ranking systems, as they encourage institutional misuse. They argue that the reliance of the ranking systems on subjective proprietary formulae and algorithms, whose original validity has been undermined by Goodhart's law, has meant that "universities have attempted to game the system by redistributing resources or investing in areas that the ranking metrics emphasize" (p. 54). Several publications (e.g. Edwards and Roy 2017, p. 57; National Academies of Science, Engineering and Medicine 2017, p. 3) argue for more effective education and other programmes that support the integrity of research, and Edwards and Roy suggest that a PhD programme "should also be viewed as an exercise in building character" (p. 57).

This book addresses that last idea—how PhD candidates can achieve success within a system that is conducted with integrity, develop within themselves a continuing, spontaneous orientation towards doing research with integrity and have the capability to act ethically at all times. While Edwards and Roy's (2017) table of growing perverse incentives in academia is compelling in terms of the need for change, we would argue for the inclusion of, as additional effects of perverse incentives, the consequential impact on research supervision, the potential for misuse of doctoral candidates in the pursuit of research outcomes and the side effects of PhD fast tracking. The need to address the problems of research misconduct as well as

the 'unintended' consequences on PhD candidates is a recognised global imperative. Our book is about the intersection between integrity in the PhD system and research integrity across global contexts.

1.2 The book title

Advice about choosing a book title commonly argues for the title to be short, memorable, easy to say, describe what the book is about and to be provocative or attention-grabbing (e.g. see Berkun 2012; Tucker 2015). We have tried to follow that advice in creating the title of this book—Playing the PhD Game with Integrity. While we were conjuring up a title, we wanted it to give potential readers a fairly accurate idea of what the book is about—to the extent that any six words could do so. The title that we have adopted first came to mind as a description of how we saw the PhD system. It is a complex array of policies, rules and procedures at individual, institutional and national levels, through which the candidate must negotiate a personal pathway to successful completion, in a specified period of time.

We also wanted the title to be somewhat provocative and to trigger potential readers' interest in querying its logic and wondering what the book is about. Isn't game playing inconsistent with ethical behaviour? Surely the book is not advocating deceit! What is the 'PhD game' anyway? Our hope is that potential readers will assume that the juxtaposition of two seemingly contrary ideas is indeed resolved within the book and that they become intrigued enough to begin reading it.

The apparent inconsistency is not real, so far as this book is concerned. Our notion of 'playing the PhD game' is not of the same kind as some common negative perceptions of game playing or Elton's (2004) referral to deceptive research practices as 'playing academic games' that we reported earlier. Such deception is not a perspective we would espouse in relation to the PhD system. Our meaning is about playing the PhD game honestly and fairly, which corresponds with one dictionary meaning of 'play the game' (Cambridge Dictionary 2018). This involves taking every opportunity to enhance outcomes, within the particular circumstances and time constraints. Edwards and Roy (2017) remarked that "academia and science are expected to be self-policing and self-correcting" (p. 51). Professional golf, where there are detailed rules to cover virtually every possible situation, provides an interesting while imperfect analogy. The PhD system is by its nature complex, and the tasks facing candidates are more intellectually challenging than golf. However, the key role of professional integrity in world golf does represent a parallel to our advocacy of integrity within the PhD system. The rules of golf are carefully and sometimes, it may seem, tediously policed by golf authorities, but such is the integrity culture among professional golfers that most breeches of the rules are notified by the person who transgressed. The rules are formulated in absolute terms to reduce ambiguity, and as a consequence, many players penalise themselves for breaking a rule, even when they were not advantaged by the action they took; they are punctilious about observing the rules (corresponding with the Thesaurus.com 2018 definition of

'playing the game') even when their lapse is accidental. That is the kind of integrity that playing the game of golf requires. For example, a professional player named Ernie Els hit a ball into rough ground in the 2017 BMW golf tournament. Els explained:

> I thought it was plugged, so I asked my guys (playing partners) if I could check it and they said yeah. I put it back and I hit my chip shot and I just felt uncomfortable by the way the ball came out. The ball came out way too good so I felt I didn't quite probably put it exactly where I should have. Under the rules you try and put it back the way you think it should be, but I still felt uncomfortable with it, so we took a two-shot penalty. I know deep down the ball wasn't quite where it should be and I wouldn't be able to live with myself. (Stafford 2017)

This particular case follows a long tradition, as shown in a story reported by Harig (2007) about a famous amateur golfer named Bobby Jones who, more than 80 years earlier, was competing in the 1925 U.S. Open. Without him or anyone else seeing it, Jones believed his ball had moved slightly as he addressed it in long grass. The movement gave him no advantage, and no one saw it move. Yet Jones penalised himself one stroke as designated in the rules of golf for when the ball moves. That eventually lost him the championship. Harig comments that it is a badge of honour to play by the rules and call penalties on yourself. It is a game of integrity.

We have a similar goal for the PhD system—that all candidates, supervisors, university managers and academic staff, government personnel, relevant politicians and examiners will automatically embrace integrity in all that they do, and that they will spontaneously act with integrity at all times. That is as far as the analogy with playing golf extends. Within the PhD system, the rules are not unambiguous and applied without contextual sensitivity, as they are in golf. Our meaning in this book for playing the PhD game involves achieving goals, within a particular context, by negotiating an ethical pathway through a range of somewhat arbitrary and ambiguous expectations. It matches the self-discipline and integrity of golf, but in a context where the rules are more ambiguous. The PhD system is complex. There are many rules spread across various parts of the system, so that observing them all unambiguously is impossible, especially as they are often at cross purposes. The implication is that all participants in that PhD system have opportunities and intentions for independent action, which creates ongoing uncertainty and ambiguity for any individual. Our book is about the PhD system as the overarching context, and we focus on PhD candidates playing the PhD game in a way that both enhances the integrity of their professional behaviour, their outcomes and their future work, and also contributes to a system that is ethical in all of its actions, for all of its participants. It is a game in the sense that individuals have personal goals and try to manage their own environment in ways that maximise their chances of success. However, our theme is around the ethical aspects of those processes, with each individual embarking on their journey with the intention of operating with integrity.

Playing the PhD game with integrity is the driving metaphor behind this book. The ways in which the PhD game is played depend upon how the game is scoped, what mindsets are in place, how progress is reviewed, as well as detailed expectations, such as can be found in 'rule books' and other boundary-setting policy documents. Also central to the success of the game is the impact of mentors who induct candidates into

the PhD system and help them move towards significant and successful outcomes. Other stakeholders within the system, such as academic managers, policy makers, administrative managers and examiners, also play vital roles. What does this have to do with integrity? Everything, we claim.

Through pursuing this line, we untangle key issues related to doctoral work, in particular, the ways in which crucial decisions are made that determine the integrity associated with processes, interactions and outcomes. The concept of the PhD game provides a lens through which doctoral pathways, interactions and destinations can be elaborated upon, scrutinised and strategised.

1.2.1 What does playing the game with integrity mean in practice?

We argue for PhD candidates (and supervisors) to play the game by behaving with integrity in any context. Such behaviour must, therefore, be fair, ethical and moral with respect to self, others and the context. Integrity centres on the individual's moral compass and the actions taken based on the many decisions that are made throughout candidature. As such, integrity encompasses respect, honesty and trustworthiness, as well as fairness, ethical practice and mindfulness. These key elements are the connecting pathways within the doctoral game and provide the central threads of this book. One key difference between the PhD game and, say, its sporting equivalent, a difference that adds to its complexity, is that the goal is for all players to be successful, a win-win objective that contrasts with most sports in which there is always at least one loser for each winner. That difference makes the characteristics of the PhD game described above both more important and more difficult. A challenging feature of the PhD game for the candidate is the balancing act that must be first achieved, and then maintained throughout, in order to complete successfully and in a timely manner. At the same time, the candidate must maintain integrity with respect to the inherent research decisions, processes and quality outcomes, as well as supervisory and publication matters (let alone some form of balance between doctoral life and personal life). The satisfaction and well-being of all members of the PhD system are a goal that can sometimes be in conflict with successful completion of the PhD. This balancing act is dependent upon not only the candidates but also the supervisors and other stakeholders such as progress panels, policy makers, managers (such as deans of graduate research education and research training co-ordinators) and examiners.

This book is grounded in our practice-led research on doctoral work. While we lean more towards the social sciences, together we do bring a science-based background (PhD and university teaching in the chemistry field, Dip Ed and teaching in tertiary education) to the task and a social science background (a PhD in literacy and sociology and a wide range of teaching experience from primary school to PhD). Between us, we have supervised over 40 successful PhD candidates, using qualitative approaches and mixed methods, and continue to do so. As experienced

providers of research training at university levels within Australia and internationally, we write about the PhD game on the basis of our knowledge, skills, experience, research and publications, related to graduate research education. While the data on which the book is based emanate from practice-led research within the Australian doctoral system, such as projects about our moral compass framework (MCF), completion mindsets and completion contexts, supervisor–candidate relationships and joint authorship of research publications, the conclusions drawn have global import. Consequently, the outcomes presented here are practice-determined. A focus on connections between the nature of doctoral work; the disciplinary and methodological contexts; the doctoral research processes, practices and outcomes (theses and other examinable outcomes, publications, presentations); and ensuant professional practice is made in order to take a holistic stance and to ensure coherence.

1.3 Three aspects of integrity that are our focus

Doctoral graduates who have successfully completed the PhD enter the professional workplace with responsibilities to the community they serve, through engagement in creative, postdoctoral activity. If PhD graduates are to succeed in creating new knowledge or new applications for society, their professional activities must be beyond reproach and inspire confidence among their stakeholders. They must both act with integrity and be seen to do so. That is the first aspect of integrity in our title.

The PhD experience is the fertile ground upon which such responsible, professional practice is built. It is the vehicle by which doctoral candidates develop a profound sense of what doing research with integrity entails. Through the experience of the PhD, candidates develop patterns of behaviour that have integrity as an implicit core principle. That is the second aspect of integrity in our book title.

PhD candidature is also an enterprise awash with challenges. Gaining access to a doctoral programme, developing a project, learning how to do research, undertaking the investigation, writing a thesis (or other outcome) and succeeding with the examination have all to be undertaken within a context of constrained resources, whether human-, material- or time-related. We address all of those aspects in this book. There are people aplenty who are more than willing to provide tips for short cuts to completing a PhD, and there may well be organisations that shape their programmes in ways that favour timely completion over quality of achievement. This can entice pressured, time-poor PhD candidates to act less than honestly and contrary to their own espoused principles. Doctoral candidates need to approach their research journey with integrity, the third aspect of integrity in our title, lest unethical short cuts undermine the development of the other two aspects. It is not possible to develop as a researcher who approaches all professional work with integrity if that attribute is not learned, practised and made second nature during PhD candidature. Inappropriate short cuts do not meet that requirement. We explore the implications of all three aspects of integrity throughout the book.

1.4 The tasks facing candidates on the PhD journey

One reason that the PhD journey involves a game aspect is that every candidate is trying to find a balance among a range of seemingly conflicting goals for their activities. Within the one enterprise, they are simultaneously:

- Learning what research entails and how to do it;
- Developing the capabilities to be a successful researcher;
- Undertaking a real research project that must, by definition, create significant new knowledge if their candidature is to be successful;
- Communicating to a set of examiners both their outcomes and evidence of their own freshly minted research capabilities.

At first glance, these goals seem to be at cross purposes. Learning to conduct research implies acquiring relevant knowledge and skills, practising what has been learned, making mistakes and modifying practices accordingly. One goal therefore is to become a capable researcher by the end of candidature, despite being less than capable along the way. This seems to be in conflict with the goal of engaging across the whole candidature period in a successful research project that creates new knowledge. It would certainly be feasible to achieve both if it were possible to access consistently high-quality support and there was sufficient time to make errors, recover and begin again, perhaps several times. However, the context for a PhD candidate is that all of the goals have to be achieved within a particular, limited time frame, and within the limits of the resources provided by the institution in which the candidate is enrolled. The latter includes institutional policies and procedures that determine access to supervision and availability of materials, equipment and other systems necessary for the successful conduct of PhD research.

In practice, such support is often not at an ideal level nor of consistently high quality, and this substantially affects the ability of a candidate to achieve the agreed goals. Access to adequate supervision greatly influences the ways in which candidates learn about research and how to do it. It is well accepted that supervision is a central element of doctoral progress (Lee 2008; Murphy et al. 2007). Furthermore, the nature of the resources available and the nature of supervisory experience in each case affect the kind of research that a candidate may be able to undertake. In addition, as discussed above, there is the significant impact of government policy that globally has focused, in the past decade or more, on timely completion, as well as increased fees and severe penalties for lack of timeliness.

PhD candidature can be portrayed as a form of reality game. Clear goals are set but in a pure sense they are not easily attained within the context within which PhD study is undertaken. Candidates need to negotiate optimal conditions with supervisors and the institution, and then manage their own capacities to learn and become capable as a researcher. At the same time, candidates need to navigate through local policies and procedures, some of which may appear to be deliberate impediments thrown up by the university. Denial of resources, less than appropriate supervision levels, and inadequate institutional systems, all are barriers to smooth pathways to success.

Getting around such obstacles is a game that PhD candidates need to learn to play. However, we would add 'with integrity' to that statement. The challenge is to get the balance right between taking time to learn, to develop research capability on the one hand and getting on with a research project that has a chance of real success within a reasonable time frame. That balance has to be achieved in honest, principled ways, that is, by playing the PhD game with integrity.

It is imperative for PhD candidates to maximise the value that they derive from every day of their candidature and from every person who supports them. There are many factors that influence achievement of the multiple goals that make up the PhD challenge, and candidates must develop a plan to maximise the positive and minimise the negative factors. In that sense too, the PhD journey is a game; there are many choices about how to proceed, and each candidate must find a pathway most likely to lead to success. A candidate without foresight may quietly read the literature for 6–12 months and then spend 6 more months developing what they perceive as a 'perfect' research project. It may be that none of the assigned supervisors has the capacity to support such a project and more time is spent finding suitable supervision. Whatever the relationship was between the candidate and the original supervisors, effort is now needed to develop the new relationships. It may be that data collection does not begin until more than 2 years after initial enrolment and could take up to a year to complete. The formal completion time of 3 (or even 4) years has been reached before analysis begins, and this takes a further 12 months to complete. By this stage, the university policy is that supervision officially ceases, and the candidacy is in jeopardy. The thesis (examinable outcome) has still to be written, but there is no formal support from supervisors or the university system per se. Termination of candidacy looms large, especially given the economic rationalist landscape in which the PhD resides. The question then arises as to how this might be avoided. Our response is by playing the PhD game better while maintaining (even restoring in some areas) integrity within the entire PhD system.

1.5 Two central themes of the book: Integrity and coherence

In order to illustrate the provocative title we chose for this book, we have so far addressed various aspects through a game metaphor. We will move away from that explicit metaphor now, as we discuss the two main themes that form our focus on the PhD challenge. Throughout the rest of this book, the metaphor will not be addressed explicitly but it remains as a driving force behind the writing.

The first theme is integrity. We focus on the issue of integrity in relation to the capabilities developed by doctoral candidates for professional practice; the manner in which they conduct their candidature; the influence of policies and processes developed by their university and their supervisors; and the impact of goals, funding systems and management processes at the levels of state and national governments. Our emphasis is on the development of a capability to act with integrity as a consequence of engaging successfully and ethically with PhD candidature. We argue

that such a capability is significantly influenced by the moral positions taken by supervisors; the university, local and national government agencies; and the research community. We take the firm stance that how candidates experience the PhD is significantly influenced by how others throughout the system behave. Upon completion, PhD graduates then bring such capability development to previously unseen professional situations and become well positioned to contribute significantly to practice with integrity. The impact on others is potentially ongoing.

Viewing the PhD through a lens of integrity, it is strikingly apparent that coherence is vital. This is the second theme of the book. We argue the need for coherence across all aspects of the PhD, especially between research findings, candidature matters, contextual influences, teaching–learning practices and learning outcomes as represented by capability to engage in professional practice. The book is structured around the first theme, and the second theme is highlighted within each chapter as relevant to its content.

Those involved in the PhD system are concerned with integrity, especially in terms of decisions that determine options, practices and outcomes. Our goal is to inform, challenge and perhaps even reassure those involved in the PhD system (doctoral candidates, prospective candidates, research supervisors, doctoral examiners, graduate research education policy makers and enforcers, academics involved in research training, those involved in risk management, methodological experts and academic writers). As the book title indicates, we focus on the PhD and the production of the thesis as the final examinable outcome. However, the issues raised here hold true for those pursuing doctorates in other forms, such as exegesis and artefact doctorates, professional doctorates and industry doctorates. Compelling implications for professional activity after graduation and inspiration for ongoing research flow from the themes of the book. Further and perhaps most importantly, the implications for integrity as a universal attribute are relevant to all situations and contexts in life.

1.6 An overview of the book: By chapter and by key construct

Our MCF for professional integrity, which is introduced in Chap. 2, informs decision-making within higher education, including within the PhD. One aspect of the integrity story is the system in which it operates; our MCF takes into account individual decision-making, through the lens of collective morality and moral development within multi-level systems (local, national, global). This mirrors the entire global research enterprise as presented in the Academies' report:

> The research enterprise is a system of individuals, organizations, and relationships that requires its constituents to fulfill their responsibilities in order to be effective. In contrast to simple systems, which are stable and whose components interact through well-understood cause-and-effect relationships, the research enterprise is more akin to a complex adaptive system characterized by dynamism and self-organization … some components of the research enterprise operate at a local level (research institutions) or a national level (research funding

> systems, to a large extent). Other components, such as publication and the dissemination of knowledge, operate largely at a global level. (National Academies of Science, Engineering and Medicine 2017, p. 14)

In Chaps. 2 and 3, we show that for such complex systems to be viable, our recently reported constructs—collective morality, moral advocacy and moral mediation—have to be embraced (Bowden and Green 2014; Green and Bowden 2015).

Using Rittel and Webber's (1973) notion of 'wicked' problems to frame decision-making where there are no clear solutions but only resolutions, we look at the PhD journey and the major decisions that need to be made along the way. We show how the uncertainty that arises in transitional periods (Baillie et al. 2013; Meyer and Land 2006), while the wicked problems are being dealt with, can be managed. This is achieved by using the MCF to guide comprehensive, collective resolutions and avoiding narrowly perceived, less useful short cuts. In Chap. 3, the framework is extended through a lens of moral development (Bazerman and Messick 1996; Jones 1991; Kohlberg 1973; Rest 1986; Trevino 1986; Velasquez and Rostankowski 1985). This leads to the ways in which we face conflict in times of considerable uncertainty and change.

The MCF then leads to a construct that we created during the writing of this book—connected moral capability. In Chap. 4, we show how this construct represents the attributes necessary to behave with integrity in complex situations involving a range of people and perspectives. The MCF is the framework that guides action, and connected moral capability comprises the related attributes needed to respond appropriately.

The new double helix model of capability development is introduced in Chap. 4 and is focused on knowledge capability, research capability and moral capability. It represents the interplay between capability development and experience. Chapter 4 draws on work done earlier by one of the authors on capability for an unknown future, in which the constructs' knowledge capability and relationality, as well as discernment and simultaneity, are central factors (Bowden 2004; Bowden and Marton 2003). It builds on the notion that the capability to act effectively in future professional roles should be the central curriculum goal in undergraduate education (Baillie et al. 2013; Bowden 2004; Bowden et al. 2000). University undergraduate students learn through interaction with current knowledge so as to become capable, some years in future, of dealing with situations in professional, personal or social contexts that cannot be specified in advance. It is argued in Chap. 4 that this capability notion is central to research training in the PhD environment and that its implementation is necessarily principle-based. Development of the capability to discern key aspects of any situation, consideration of the range of possible responses and formation of ethical judgements about how to proceed are represented as key elements of acting as a professional with integrity. Examples from PhD projects are presented, and the range of potential responses is canvassed and analysed, in terms of their integrity status.

Chapter 5 presents our theoretical model of completion mindsets and completion contexts. In essence, this model emerged as we responded to the pressures on candidates and their supervisory panels to complete well and on time. Our research shows

how important it is to adopt a completion mindset in the pursuit of doctoral success. The chapter shares PhD success stories from the perspective of the candidate and builds on Green's (2003) RIP (relational, intellectual, physical) model for supervision, adding E (emotionality) as a key component to form the more comprehensive RIPE model. These theoretical frameworks and practicalities are extended through the application of a core element, namely integrity, and in so doing provide learning opportunities for outcomes in professional life. The notion of 'spaces of influence' (Green 2005) is highlighted in terms of the creation of spaces to scaffold opportunities where doctoral candidates engage in learning for an unknown future, as they work alongside influential others in their pursuit of success.

We argued earlier for the importance of research integrity per se, as well as integrity within the PhD system. We presented the literature that suggests that research integrity has internationally been in decline in recent decades (Buckwalter et al. 2015; Edwards and Roy 2017; Elton 2004; National Academies of Science, Engineering, and Medicine 2017). Chapter 6 addresses integrity principles for research in various countries. The principles are published as codes, apply to all researchers, including PhD candidates, and have been developed over the last decade in relation to that reported global decline in research integrity. In Chap. 6, we also explore issues of relationality and 'the myth of objectivity' (Bowden and Green 2010a) and then move to matters of research integrity, with particular emphasis on those pertaining to qualitative research. We consider the decisions made in all aspects of research including protocols, processes (prior to entering the field, in the field, post-field) and outcomes. Matters for research participants including well-being, confidentiality and anonymity are raised under the umbrella of integrity. Further, we consider community expectations and how they are linked to the researcher's own moral compass. Avoidance of bias, even if unobserved or undetectable, is an essential integrity principle highlighted in Chap. 6. The chapter draws on a range of qualitative research examples, using developmental phenomenography as a methodological case study. The role of research teams and devil's advocacy as a device to ensure research integrity is also explored.

In Chap. 7, matters of integrity are illuminated through practical elements of the doctoral experience for research candidates. These elements include planning and conducting the research, while managing supervisor–candidate relationships, and preparing for and negotiating examination processes. Intellectual property (IP) issues arise when research outcomes, such as publications and patents, emerge.

Writing with integrity is the focus of Chap. 8. Academic writing practices and outcomes demand high standards with respect to quality, and integrity is an essential element considered here. The practices behind writing outcomes, such as theses, conference papers, publications and reports, demand that authors write within ethical responsibilities to participants, colleagues and organisations, as well as self. Doctoral writing undergoes rigorous examination processes in which integrity is a necessary but insufficient condition for success. Examiners demand evidence of conceptually complex and significant contribution with respect to outcomes. Evidence of flexibility and adaptability as well as an understanding of relevant contexts is vital, as are integrity matters. While professional standards of English language usage and