



Preparation for doctoral research: a narrative review

Ailie McDowall¹ · Fabiane Ramos²

Received: 1 August 2022 / Accepted: 12 April 2023 / Published online: 20 May 2023
© The Author(s) 2023

Abstract

In Australia, only two-thirds of doctoral students finish their degrees, with underrepresented students completing at even lower rates. Students who successfully complete still experience many challenges throughout their degrees. In this narrative literature review, we use *preparation and readiness for the doctorate* as a framework to examine how students are prepared for studies at the doctoral level, the challenges they experience, and the support that universities provide. We also weave our own stories of the doctorate to demonstrate how the issues raised in the literature play out for doctoral students. Our findings suggest that how students are prepared for the doctorate remains under-researched, with much of the literature focusing on issues that emerge once students commence, and the supports that are provided in response to these challenges. A future focus on preparation may provide insight into how institutional processes can better support doctoral students to successfully complete their degrees.

Keywords Doctoral preparation · Academic readiness · Higher degree by research · Research education · Transition pedagogies

Fabi: For my first day as a PhD student, I bought a nice new shirt because I wanted to look the part (the part I imagined I needed to play at least). It felt important to be a PhD student, with a great career ahead of me. ‘I am ready for the challenge, and I look really nice in my silky orange shirt. That’s a good start’. I enrolled in every single workshop available to HDR students because I was a good student.

✉ Ailie McDowall
ailie.mcdowall@jcu.edu.au

Fabiane Ramos
fabiane.ramos@usq.edu.au

¹ Indigenous Education and Research Centre, James Cook University, Building 301, 1 James Cook Drive, Townsville, QLD 4811, Australia

² USQ College, University of Southern Queensland, Building A, 37 Sinnathamby Bvd, Springfield Central, Ipswich, QLD 4300, Australia

I had always been the ‘good’ student with good grades, and I was convinced that if I just kept doing what I had always done before I’d be fine. It was not long after that first day that reality started to sink in. I felt lost and realised that I was completely out of my depth. I had to work with theory. It was a PhD, Doctor of Philosophy. Philosophy is in the very name of the degree, yet I had zero training in philosophy or how to work with theory to a high level. It quickly became clear that the preparation I received in my Master’s was child’s play compared to what was now expected of me. And even within the PhD program, apart from generic workshops, there was no formal way to learn how to work with theory.

Ailie: On my first day of the PhD, I did my workplace health and safety inductions, was shown the fire exits, got my photo taken for an ID card, was introduced to the other students in the office, and finally, allocated a computer space. I sat down, turned on my computer, and stared at the screen. Now what? Google ‘How to write a PhD’? Instead, I went into the only database I knew and started plugging in terms relating to my topic, downloading a handful of papers that looked interesting. I dropped in to see one of my supervisors, a junior academic. She gave me some advice, I smiled, she wished me well, and I went home again. It was several weeks before I met my whole advisory team, and so I kept myself busy attending workshops run by the Student Services Centre. I scribbled notes and applied what I’d learnt straight away. I went back to my computer and drew up a table to tabulate my readings. I printed and highlighted and filed my printouts, labelling anything that I found challenging ‘philosophy’.

In Australia, only 25% of full-time Doctor of Philosophy (PhD) students complete their degrees ‘on-time’, and 33% never graduate. Underrepresented students complete at even lower rates (Department of Education, 2018). The Australian PhD is the highest qualification available, and the government funds students’ enrolments for up to four years (Department of Education, 2021). Given this slow rate of completion, in this paper we review the literature on how doctoral students are prepared for studies at the doctoral level, the challenges they experience, and the support that universities provide. We analyse this literature through the framework of *preparation and readiness for the doctorate*. In the United States (US), discussions on doctoral preparation often refer to curriculum within the PhD program (e.g. Eisenhart & DeHaan, 2005). However, students’ level of preparedness before they commence the doctorate remains under-researched, and this is the focus of this narrative literature review. The narrative review has a double meaning here: we also weave our own stories of the doctorate to demonstrate how the issues raised in the literature play out for doctoral students. Reading these narratives through the framework of preparedness reveals the relationship between the challenges we each experienced; rather than treating these as single issues, as they so often are in research literature.

Doctoral education research is a large and diverse field. In this paper, we review a segment of this literature that relates to doctoral students’ preparation and readiness. We used the following search strings to interrogate OneSearch databases:

- (PhD OR Doctora* OR ‘Postgraduate research’ OR HDR OR ‘higher degree by research’) AND (prepar* OR readiness OR pathway* OR entry)

- (PhD OR Doctora* OR ‘Postgraduate research’ OR HDR OR ‘higher degree by research’) AND (support OR issue OR challenge OR problem OR training)

The literature review we present here is not systematic, rather it explores relevant literature through the lens of doctoral preparation and readiness. We draw on international literature, but prioritise Australian studies, given the differences in doctoral education in different countries (for example, in the United States students undertake coursework and a comprehensive examination as part of their PhD; in Scandinavia, students are employed by the university and undertake little if any required curriculum). We have structured this literature review based on the common progression students take through the doctorate: the motivations to apply, the pathways students take into the doctorate and the preparation offered within these pathways, the challenges—both academic and psychological—that emerge when students commence, and finally, the personal characteristics and supports that enable students to succeed. In each section, we share some of our own stories that relate to the topic at hand.

Defining doctoral preparation and readiness

‘Doctoral preparation’ has received some attention in previous literature, namely in discussions about the types of preparation doctoral students should receive to prepare them in their future research careers (e.g. Young, 2001). This theme was a common occurrence in the literature that we reviewed, and it is clear that the doctoral students have many competing demands placed on them. There are debates about the types of research training that students should be exposed to (e.g. Eisenhart & DeHaan, 2005) and students’ preparation to work in epistemologically diverse research communities (e.g. Pallas, 2001). Additionally, concerns have been raised about disciplinary requirements for doctorally-trained workforces (e.g. Carr & Galvin, 2005), government ambitions for industry collaborations and training (e.g. Owens et al., 2019; Valencia-Forrester, 2019), transferable skills (e.g. Milos, 2019), and better preparation for later university teaching and research (e.g. Jepsen et al., 2012; Schwartz & Walden, 2012). Given the number of demands on PhD students’ time, it seems pertinent to consider how students are prepared to do their primary task: that is, to undertake a major research project culminating in an independent research thesis.

In contrast to the current literature on doctoral preparation, here we focus on the types of activities that prepare doctoral students to complete this task. In doing so, we turn to the broader educational literature on academic pathways and transition pedagogies (Kift, 2015). *Academic readiness* is a broad term used to explain the status of students transitioning into new educational environments, such as school-leavers starting university (Porter & Polikoff, 2012). Whilst academic readiness is often measured through standardised achievement measures (Porter & Polikoff, 2012), qualitative understandings of academic readiness incorporate content knowledge, academic behaviours, meta-cognitive and learning strategies, and knowledge about the learning environment (Reid & Moore, 2008). Preparation is thus the activities that enable academic readiness. Here, academic preparation and readiness are

reference points to explore how predoctoral and doctoral curricula develop the academic behaviours, knowledge, dispositions, strategies, and skills that are required for doctoral level studies.

Entering the doctorate

Motivations for the PhD

Fabi: I knew I wanted to teach, and I knew I didn't want to teach children. I had been an English as an Additional Language teacher at a private language college for a few years and I understood that teaching in that industry would be unsustainable for me financially long term. I also wanted a challenge and to go beyond what I had been doing until then. It then occurred to me that teaching at university sounded like a path I wanted to take. I was towards the end of my Master of Applied Linguistics at that point and an academic career seemed appealing to me. I checked what was the requirement to become a lecturer and found out that a PhD was a must.

In researching preparedness, we found a range of studies exploring students' motivations for undertaking a PhD. Students are driven by personal motivations, such as a love of learning, an interest in research and a personal challenge; social motivations, such as being encouraged by family or academic teachers to engage in research; and professional motivations, such as broadening career opportunities or developing professional knowledge (Guerin et al., 2015; Naylor et al., 2016; Skakni, 2018; Stehlik, 2011). Guerin and colleagues (2015) suggest that students negotiate intersecting motivations at different stages of their candidature. Some students, particularly those from underrepresented backgrounds, often have additional motivations. In a study of Indigenous Australian postgraduate research students, for example, making research accessible and beneficial for students' communities were key motivators, as was the importance of having Indigenous researchers setting the agenda for Indigenous peoples (Barney, 2018b). These students also discussed the importance of being encouraged to apply by teaching staff, and previous research experience. In the United States, engaging with Latinx professors was particularly motivating for first-generation Latinx students (Bañuelos & Flores, 2021). These professors were also able to provide experiential knowledge to support students in their applications, such as sharing information about scholarships for low-income students. Motivations are included in assessments of students' own motivation, personal circumstances, and understanding of the application process (e.g. DeWitty et al., 2016; Syed et al., 2020) as a way to measure personal (rather than academic) readiness.

Whilst motivations may not relate directly to academic preparedness, understanding the reasons students choose to enrol in a doctorate provides context for students' mindsets as they commence their degrees. It would also appear that students' experiences in earlier degrees contribute to the decision to undertake doctoral research, and it is to these degrees that we now turn.

Preparation in qualifying degrees

Ailie: I didn't know it at the time, but the pathway I took to the PhD was 'traditional'. A four-year undergraduate which culminated in an Honours year, and I was deemed ready to take on the highest degree the country offered – a PhD. But my Honours experience was something more akin to factory farming than a scholarly endeavour. A hundred and thirty students were each assigned a supervisor and enrolled into specialist seminars that explored ever increasingly specific and applied knowledge. Our research methodology course focused on advanced statistics, our lecturer promising that we would be more knowledgeable than 99.9% of the population. To this day, I'm still not sure what bootstrapping is, and nor did it help me to write a thesis.

We also found in the literature a small body of Australian research that describes the pathways that students take into the PhD, which is vital to understanding what preparation best supports doctoral students. Traditionally, the primary qualification for an Australian doctorate has been an Honours degree (Kiley et al., 2009). Whilst some disciplines offer Honours degrees embedded within the four-year coursework, in most fields an Honours is an end-on degree, that is, a distinct fourth year completed after three years of undergraduate study (Shaw et al., 2013). In one study, supervisors suggest that an Honours degree prepares students with time management skills, practice in thesis writing and the ability to communicate research findings, giving a solid preparation for further postgraduate research; and students view their learning as a 'vital precursor' (Kiley et al., 2009). Honours students in an end-on degree also show more evidence of research preparedness, with higher levels of self-efficacy, motivation, a better understanding of the research environment and an orientation towards research (Shaw et al., 2013). However, universities and disciplines have considerable differences in prerequisites, curriculum and assessable components (Kiley et al., 2011). This variability makes it difficult to assume readiness for research. In a series of interviews with Honours coordinators, Kiley et al. (2011) report that it was often the Honours supervisors' role to teach research skills, but with far less support than is provided for PhD students. Furthermore, surveyed Honours students report that the requirement to *acquire* new knowledge is high, making it difficult to balance with the need to *produce* new knowledge (Manathunga et al., 2012). Some of these students are required to complete high loads of coursework and assessment that do not relate to their research project.

In addition to Honours degrees, Australian students are increasingly entering the doctorate through a variety of pathways. Bourke et al. (2006) report 46% of students having an Honours qualification, with the rest entering through coursework and research master's degrees. Kiley and Cumming (2014, 2015) argue for more research to identify Australian pathways to the doctorate, and further investigation of the training provided to students in their earlier degrees. They found that students who enter a PhD following a coursework Master's with a minor research thesis tend to feel somewhat prepared for PhD research (Kiley & Cumming, 2014), a sentiment not matched by PhD advisors (Baglin et al., 2017; Drisko & Evans, 2018; Kiley & Cumming, 2015). Rather, advisors see a coursework Master's as an unconventional

pathway to the PhD, only suitable for high achieving students. Nonetheless, student data from a range of Australian universities suggest that students with a prior Master's degree complete their PhDs earlier than students with an Honours entry qualification (Bourke et al., 2006). International studies suggest that coursework Master's degrees can be a productive environment to teach research, with supervision and students' intellectual motivation the best predictors of self-reported research skills, rather than students' personal backgrounds (Drennan & Clarke, 2009). Given the inconclusive outcomes in this small group of papers, more research is required to understand how qualifying degrees can prepare future doctoral students to complete doctoral studies.

However, insight into a fuller conceptualisation of PhD-readiness can be found in international case studies of preparatory programs for underrepresented students. One study by Williamson (2016) reports that a first year PhD program that prepares African women for doctoral studies has had a positive effect in fostering solidarity and academic identities for the women enrolled. The focus on identity is also prominent in the United States, where several universities have trialled preparatory programs to encourage Black/African American, Hispanic/Latino and Native American students, as well as students with disabilities, to enrol in PhD programs. These programs range from first-year undergraduate programs (Luedke et al., 2019), to summer research intensives (Martinez, 2018; McCoy & Winkle-Wagner, 2015; Salerno et al., 2017) and one-year pre-PhD programs (Hall et al., 2016). Whilst most of the reported programs focus on building a scholarly identity, similar to Williamson (2016), they also report a range of outcomes including improved self-efficacy, disciplinary knowledge, research and academic skills, academic communities, and confidence in navigating professional environments. Most of these studies are limited by only incorporating immediate and self-reported evidence, with a notable exception. Hall et al.'s (2016) full year program for biomedical students offered a comprehensive curriculum, with 91% of students matriculating into a competitive PhD program. Here, students were taught how to quickly and critically analyse scientific literature, received laboratory skills training, prepared for the entry examination, developed an individual learning plan with a mentor and the program director, and received tutoring for a biomedical skills course. These students reported increased self-efficacy for scientific research and had a high retention rate in the PhD program (95%). The range of activities offered in this program may provide useful to mapping an understanding of curriculum that can support PhD readiness, given the challenges that doctoral students face throughout their degrees.

Fabi: I made up my mind and started working towards getting accepted into a PhD. I enrolled into the pre-requisite research methods and dissertation units and worked very hard. However, I was confused about the research methods course as I felt it was quite vague. With the dissertation unit, it was a massive challenge getting a full research project completed in one semester, but it was exciting being able to 'do' research. Managing to get this project done was a major motivator for me. I did not only complete the project but also achieved a High Distinction and received a full scholarship for the PhD program in Education that I had chosen. This was a proud moment. As an immigrant, writing in my second language,

knowing that I had done well in the Master's thesis, gave me the confidence to believe that I was ready for the challenges of a PhD. Little I knew that I was about to have the shock of a lifetime.

Challenges in the doctorate

Research and institutional challenges

Ailie: Some of the challenges I experienced can be explained by changing disciplines, and working in research traditions that were very different from the ones I had trained in. It took me a year or two to understand that there were different traditions of research with different underlying assumptions. It wasn't until I later began supervising students myself that I could really articulate the fundamental epistemological differences between positivist, interpretivist, critical and post-structural schools of thought. There was so much to learn, a whole new set of language that revealed a way of thinking. I was absorbing the lessons as quickly as I could, but there was always another word or concept around the corner, and everybody else seemed so sure that they knew what they were talking about.

While students' preparation for the PhD has received little research attention, the challenges that students face during their doctoral degree have been well documented, highlighting potential areas to improve preparation. Research to date has identified gaps in students' knowledge and skills for several of the key capabilities that are needed to successfully complete a PhD. These include investigations of research skills (Bamgboje-Ayodele et al., 2016), academic reading and writing (Ma, 2021; McAlpine, 2012), challenging disciplinary conventions (McDowall & Ramos, 2018), statistics (Baglin et al., 2017), academic integrity (Mahmud & Bretag, 2013), and library search literacies (Warburton & Macauley, 2014). In an Australian study, Bamgboje-Ayodele et al. (2016) analysed the limitation sections of PhD theses and interviews with final year students to explore the challenges students faced during their degrees. Research-related issues—such as problems with methodology and how to conduct a study—were central in the findings. However, the data revealed other areas of concern for students, such as insufficient resources, supervisor availability and information about university processes, as well as personal challenges including work-life balance, isolation and cultural mismatches. Similar non-academic issues that can hinder students' progress are more widely documented in the literature (e.g. Due et al., 2015; Son & Park, 2014; Velandar et al., 2021; Zeivots, 2021). Interviews with first-year doctoral students show how academic, self-organisational, institutional, and social factors can create high levels of stress and anxiety as students move from previous degrees to a more independent doctorate (Hockey, 1994). Learning to manage one's emotions and self-perception as a doctoral student becomes a challenge that students must negotiate in their first year (Green, 2016).

The types of challenges that students experience are emphasised in studies investigating the experiences of students who have traditionally been underrepresented in academia, or in their disciplinary fields. For these students, there has been a particular emphasis on personal factors in the literature, suggesting that finance, isolation and outside-of-university responsibilities may impact these students more. For example, in an investigation of success factors, Barney (2018a) identified key obstacles affecting Aboriginal and Torres Strait Islander postgraduate research students' completion: social isolation, financial pressures, being first-in-family, and complex family and community responsibilities. Similarly, women completing their doctoral studies in STEM disciplines have added responsibilities of balancing financial and caring duties, often resulting in slower completion rates (Velander et al., 2021). For culturally and linguistically diverse students, particularly those who move countries to enrol in their studies, isolation compounds with the challenges of negotiating new academic, cultural and linguistic environments (Due et al., 2015; Son & Park, 2014; Zeivots, 2021). This research, with its emphasis on the personal and social, illustrates the complex issues outside of the university which impact students' progression.

Fabi: I started reading and trying to figure out what to do. I borrowed all the methodology books I could find. I sat, I read, I struggled. I had the self-regulation and discipline to manage my time, to get things done, to work hard, but I just didn't know what to do. I could write academically but I didn't know how to create the 'original contribution to knowledge' that was expected of me. I wanted to give up. But I'm not the type of person who gives up easily. The Master's helped very little, the workshops were too generic, the initial support from supervisors was there but limited by restrictions with time. Looking back today, I realise that too much emphasis is put on the relationship with supervisors. It's unrealistic to expect that supervisors (with multiple priorities) can be the central and sometimes only source of support to students. I could not expect this from them. I know they assisted me as they could at the time.

Mental health challenges

Ailie: Sitting quietly before a supervision meeting became a habit as I calmed myself down and steeled myself up for another hour of feeling out of my depth, legs pedalling below the surface to keep myself afloat as I smiled and nodded and took notes as my supervisors directed me to concepts and theorists that I didn't understand. I stopped drinking coffee, aware that the continuous knot in my chest wound itself tighter with chemical stimulation. And I took on work, and volunteering opportunities, and service roles, all allowing me to avoid working on my thesis. I needed the work. I was scraping by with a half dozen casual teaching contracts and private tutoring sessions. I couldn't afford to say no to paid work.

Fabi: The other people in the office, in our little PhD factory as we called it, were going through similar motions. The ones further ahead in their degree would encourage the newbies, and that collegiality was a lifeline in those early dark days. I sat, I read, sometimes I cried. And that feeling on my chest, like someone was pressing it down and constricting airflow, started growing little by little. The constricting feeling on my chest soon became part of my daily life. It took me a while to understand that wasn't healthy. It was not until much later and with a lot of work that I started to heal from that weight on my chest. I kept going, I sat, I read. Theory was still not within my grasp. I felt inadequate. 'Maybe I'm not cut out for this,' I told myself multiple times.

Given the multiple and diverse challenges that doctorate students face, a growing area of research investigates mental health and well-being as central aspects of students' experiences. A well-documented consensus in this body of literature is that doctoral students are at a considerable higher risk of poor mental health compared to the general population (Hazell et al., 2020) and that the doctorate itself contributes to poorer mental health outcomes (Mackie & Bates, 2019). Here, a range of risk factors are at play, including students' relationships with supervisors, finances, and their institutional and personal supportive systems (Berry et al., 2020; Hazell et al., 2020; Mackie & Bates, 2019; Sverdluk et al., 2018), social isolation (Hazell et al., 2020), and perceived career prospects (Byrom et al., 2020; Mackie & Bates, 2019). Hazell et al.'s (2020) meta-analysis established that overall, women doctoral students are more likely to experience poor mental health outcomes, with smaller studies suggesting that males are more likely to experience isolation outside of the university yet experience less anxiety in their studies (Usher & McCormack, 2021). Berry et al. (2020) suggest that this combination of personal, social, and institutional factors exist in a delicate balance.

In addition to institutional and social factors, students' preparation for doctoral studies appears to have a relationship to their wellbeing. In a survey of doctoral students in the United Kingdom (UK), those who felt well prepared for their studies were less stressed (Byrom et al., 2020). Similarly, UK doctoral students suggested that an emphasis on students receiving better training and development in research skills would be useful to support their mental health (Jackman et al., 2021). Here, it is clear that there is a relationship between the types of challenges detailed in the research literature and wellbeing. While many of the proposed interventions seek to support students' mental health literacy and coping strategies (Schmidt & Hansson, 2018; Waight & Giordano, 2018), being better prepared for doctoral studies may alleviate some of the risk factors influencing doctoral students' poor mental health.

The focus on challenges that doctoral students face (whether these be research-related, personal, institutional, or issues of mental health and wellbeing) has been a prominent focus of doctoral education research in recent decades. Reading this literature through the lens of academic readiness and preparation suggests that a diverse preparation is needed for students wanting to enter doctoral degrees, drawing together research-related skills and capacities, an understanding of how to navigate institutional and degree related systems, building the supervisory relationship, and the potential to build communities of support, amongst others. To extend this mapping of

the preparation required by doctoral researchers, we now turn to the support offered throughout the degree.

Getting through the doctorate

Personal characteristics

Ailie: I found strategies to keep myself going. A post-it note above my desk reminded me that if it was easy, everyone would do it. I often took time to look back on where I came from, amazed at how much I had learnt in a few short years. I ran. I maintained work and friendships outside of the university, which gave me some perspective which was missing at the tender age of 26. I read books on writing and slowly realised that motivation followed action (Gardiner & Kearns, 2010), and that nobody is ever ‘in the mood’ to write difficult things (Deveny, 2016)—that one had to, simply, start. I also re-formed my understanding of what a doctorate was—not a Nobel Prize, but an apprenticeship in research, an education, an opportunity to move my field along in a small step, not a giant leap.

Given the challenges that PhD students face throughout their candidatures, there has been a decades-long movement to better understand the factors that help students to persist and complete. This research helps us to further map the preparation students require to work at a doctoral level. In light of institutional pressures to ensure that doctoral students completed, studies in the 1980s (predominantly in the United States) tried to identify the characteristics and commonalities of students who persisted in their studies, particularly those from underrepresented backgrounds (e.g. Clewell, 1987; Nettles, 1990). These studies mostly focused on demographic indicators, as well as students’ experiences within their research degrees. In the 2000s, more qualitative research tapped into advisors’ knowledge of the characteristics of successful doctoral students. Lovitts (2008), for example, interviewed experienced advisors to identify the personal characteristics that predict distinguished completions: ‘practical and creative intelligence, informal knowledge, perseverance in the face of frustration/failure, tolerance of ambiguity, self-direction, a willingness to take risks, and intrinsic motivation’ (p. 323). These indicators are reflected in other studies (e.g. Skakni, 2018). In both of these studies, the authors note the difference between a coursework Master’s and a PhD, with one interviewee in Skakni’s study noting that ‘between the master’s and doctoral levels, there’s a whole flight of stairs’ (p. 933). However, many students, including students in Australian universities, do not appear to enter their degrees with the epistemic openness (that is, being open to uncertainty and complexity) that predicts more constructive metacognitive strategies (Cantwell et al., 2017).

Communities of support

Fabi: Towards the end of my first year, I met a group of PhD students from different disciplines all working with decolonial theory. This was a turning point because it felt that finally I started to receive the preparation that I needed for my PhD. Most of the people in the group were further ahead in their degrees and had trained in Philosophy. We were reading complex texts and sitting together to unpack theory and think how we could apply it to our research. This community feeling of mutual help and intellectual engagement was unlike anything I had ever experienced. Looking back now, these relationships and collective intellectual work were fundamental to help me finish my degree. The decoloniality group was also a lifeline because it opened my eyes to a whole new way of thinking academically. For the first time I was curious about theory and to find out that there are many paradigms and ways of writing that were unfamiliar to me.

In addition to personal characteristics, other studies have focused on supervisory, institutional and project factors that influence students' completions. In a review of research related to completions, Sverdlik et al. (2018) suggest that whilst supervisory relationships are considered to be the most influential factor, the university environment plays a major role by socialising students into research cultures. Support can also come from outside of the research environment. Alongside strong supervisory relationships and other students, Indigenous Australian postgraduate research students report family support and Indigenous student support centres as key elements in their success (Barney, 2018a). Similarly, PhD students in England draw on family, friends, and sport to build their resilience (McCray & Joseph-Richard, 2020).

Ailie: Somehow, I scraped through. I realised that if I was experiencing these challenges, then other people were too. As the student representative, there was an opportunity to respond systematically. My colleagues and I surveyed the broader student body, and established a series of workshops to answer some of the questions we had about theory, method, data. I joined several reading and writing groups, where we would read theory and share drafts of our writing. Far from the blind leading the blind, these groups provided friendship and working relationships with students and staff who had a better understanding of the issues I was grappling with. I sat and listened and learned. I tried out different ideas. We organised visiting academics and symposia, where we could invite in the very theorists whose work we were using. I read philosophy with a colleague who had trained in that discipline. I attended postgraduate workshops run by my discipline's national research society. These were never quite aligned to where I was in my journey, but provided insight into a range of complex issues.

University support services

There has also been an institutional response to the challenges raised in the literature. Universities' attempts to boost their rates of successful completion has been

well documented. Academic writing has been a key area of concern in research, perhaps because of its central role in doctoral completion. Initiatives such as multidisciplinary writing groups (Cuthbert et al., 2009), peer reviewing workshops (Batty & Sinclair, 2014), thesis writing groups (Chatterjee-Padmanabhan & Nielsen, 2018), writing for publication (Cargill & Smernik, 2016) and writing improvement/feedback program (Hey-Cunningham et al., 2021) have received positive feedback from participating students and advisors. Whilst most of this research measures impact through participants' self-perceptions, Tynan and Johns (2015) were able to demonstrate an increase in writing capacity using a standardised measure following a 6-month program of tailored language support for English as Additional Language students.

Academic support extends beyond writing. Library consultations to support the development of literature research skills (Warburton & Macauley, 2014), individualised learning plans (Ayers et al., 2018), foundational statistics workshops (Cronley et al., 2019), and mentoring programs (Brown et al., 2020; Guo et al., 2018; Moore et al., 2020) are among other initiatives that have shown promise in improving commonly required capabilities after doctoral students commence their programs. The initiatives explored in this body of research also seemed to be important sources of social support, an aspect recognised as significant for students' progression and well-being. Much of the research also emphasises the importance of socialising students into their academic identities when theorising the learning students undertake in a doctorate degree (e.g. Cuthbert et al., 2009; Guo et al., 2018; Kwan, 2009).

The student support initiatives and programs that universities offer suggest institutional issues with students' preparation for the doctorate. The initiatives are remedial and aim to address the gap between the level of preparation and the expected level of students' capabilities in the doctoral curriculum. In other words, this previous research has examined programs that emerge as a response to challenges after students commence their PhD. By mapping the issues that arise, we hope to begin formulating a program of reform, whereby universities can more systemically prepare students with an aligned curriculum prior to (or early in) their degrees, decreasing the need for remedial interventions.

Fabi: For the first time since my first day, I felt that I could drop the mask that I was trying to create, the PhD student mask. The one that reads the right people and writes in a contrived way but that gets over the line. Slowly my confidence boosted, and I started experimenting with alternative and creative ways of writing academic texts and reading theorists that were more suited to my work (McDowall & Ramos, 2018). I realised that I had to look for my own preparation to be in a position to complete the PhD.

Conclusion

Ailie: I remember the day that my supervisor called me as I was on the bus, heading towards the university on a chilly winter's morning. She had read my thesis, and wanted to talk to me about it. Holding down the emotional wall, I lis-

tened intently, finally pausing her to ask, Is it a thesis? After a brief moment, she replied, Yes, it's a thesis. If I wanted to submit in the coming days, it was examinable, but she recommended I take the time to make further changes and edits, to strengthen the core and clean the argument. The day before I submitted, I re-wrote the conclusion, again, still not sure how to wrangle what I had written into a final statement, where everything I learned felt anything but final.

Many students experience personal and academic challenges throughout their doctorates, and these degrees are marked by a high attrition rate internationally. In this paper, we explored the research related to doctoral students' eventual success or failure: how doctoral students are prepared for studies at the doctoral level, the challenges they experience, and the support and characteristics that help some students to persevere. Much of the literature we reviewed focuses on issues that emerge once students commence, and the supports that are provided in response to these challenges. On the other hand, the systematic investigation of students' academic preparation and readiness prior to the PhD and its relationship to completion remains an under-examined area of research. Further investigation of preparation for the doctorate may provide insight into the challenges doctoral students experience as well as how institutional processes can better support students. The current literature does, however, provide direction as to what types of readiness and preparation are required for the doctorate. In mapping the previous research, we were able to establish that what PhD students need to be successful is multi-faceted, as are their experiences throughout their degrees. Students' dispositions, meta-cognitive strategies, research skills and disciplinary knowledge contribute to their success, as does their ability to read, think, and write critically in their disciplinary field. Students' ability to navigate sources of social support, supervisory relationships, and institutional environments also influences their progression. While the current research mostly treats these factors as fragmented, isolated and unrelated issues (similar to Sverdlik et al.'s (2018) findings), preparation may better demonstrate the complex interrelationships between student and institutional factors.

What is already clear is that preparation for doctoral level studies must be robust, given the combination of academic, affective, psycho-social and socio-emotional factors at play. While students may have little control over shaping external factors, preparation may give students more agency in mitigating some of the challenges they may face. Where previous research has investigated the issue of student success or failure retrospectively, a focus on preparation would instead centre on the responsibilities that institutions have to set students on a pathway for success in the doctorate.

Whilst this review is an initial step in a broader program of research into the question of preparation for the doctorate, we suggest that the evidence provided here already provides guidance to university educators looking to support doctoral students more systematically. In particular, those with responsibility for pathways into doctoral research, including Honours, Master's by Research, and increasingly coursework Master's programs, can start to analyse and renew their own curricula to better align them with the needs of doctoral students. Such an analysis would need to cover the range of factors: what research skills are developed through the

preparatory program? How can educators embed opportunities to practise reading and writing with different theoretical frameworks? What curricular elements can help to develop the personal dispositions and emotional regulation strategies that characterise successful researchers? How can students start to build academic communities within their fields? How do students learn to take on feedback and critique? By better preparing students for studies at the doctoral level, it may be possible to lessen the challenge for both students and advisors to bring students up to speed in the initial years of the doctorate, and to instead open more space for the new generation of researchers to exceed.

Fabi: It was hard. I sat, I read, I talked, I wrote, I cried. In the blink of an eye, I was in my third year. I managed, I made it to the finish line. I wrote my 200+ page thesis. I am a doctor now. I developed a love for theory. I battled chronic back pain and anxiety for the year after finishing the PhD. I had to do some deep digging and healing work to get to a better place. I wonder how things would have been different if I had received a more robust preparation before going into the PhD? What would this preparation look like to foster a healthier PhD experience?

Author contributions Both authors were involved in the conceptualisation of the research, literature searches, the analysis of literature, and drafting and revising the manuscript.

Funding Open Access funding enabled and organized by CAUL and its Member Institutions. Not applicable.

Data availability Not applicable.

Declarations

Conflict of interest No potential conflict of interest was reported by the authors.

Ethical approval Not applicable.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

References

- Ayers, N. L., Kiley, M., Jones, N., McDermott, M.-L., & Hawkins, M. (2018). Using learning plans to support doctoral candidates. *Innovations in Education and Teaching International*, 55(3), 248–256. <https://doi.org/10.1080/14703297.2016.1233074>

- Baglin, J., Hart, C., & Stow, S. (2017). The statistical knowledge gap in higher degree by research students: The supervisors' perspective. *Higher Education Research and Development*, 36(5), 875–889. <https://doi.org/10.1080/07294360.2016.1264373>
- Bamgboje-Ayodele, A., Ye, M., Almond, H., & Sakulwichitsintu, S. (2016). Inside the minds of doctoral students: Investigating challenges in theory and practice. *International Journal of Doctoral Studies*, 11, 243–267. <https://doi.org/10.28945/3542>
- Bañuelos, M., & Flores, G. M. (2021). 'I could see myself': Professors' influence in first-generation Latinx college students' pathways into doctoral programs. *Race, Ethnicity and Education*. <https://doi.org/10.1080/13613324.2021.1969906>
- Barney, K. (2018a). Community gets you through: Success factors contributing to the retention of Aboriginal and Torres Strait Islander Higher Degree by Research (HDR) students. *Student Success*, 9(4), 13–23. <https://doi.org/10.5204/ssj.v9i4.654>
- Barney, K. (2018b). 'We need more mob doing research': Developing university strategies to facilitate successful pathways for Indigenous students into Higher Degrees by Research. *Higher Education Research & Development*, 37(5), 908–922. <https://doi.org/10.1080/07294360.2018.1467382>
- Batty, C., & Sinclair, J. (2014). Peer-to-peer learning in the higher degree by research context: A creative writing case study. *New Writing*, 11(3), 335–346. <https://doi.org/10.1080/14790726.2014.932814>
- Berry, C., Valeix, S., Niven, J. E., Chapman, L., Roberts, P. E., & Hazell, C. M. (2020). Hanging in the balance: Conceptualising doctoral researcher mental health as a dynamic balance across key tensions characterising the PhD experience. *International Journal of Educational Research*, 102, 101–1575. <https://doi.org/10.1016/j.ijer.2020.101575>
- Bourke, S., Holbrook, A., & Lovat, T. (2006). Relationships of PhD candidate, candidature and examination characteristics with thesis outcomes. Conference Proceedings. <https://nova.newcastle.edu.au/vital/access/services/Download/uon:9597/ATTACHMENT01>
- Brown, R. D., Geesa, R. L., & McConnel, K. R. (2020). Creating, implementing, and redefining a conceptual framework for mentoring pathways for education doctorate students. *Higher Learning Research Communications*, 10(2), 20–37. <https://doi.org/10.18870/hlrc.v10i2.1188>
- Byrom, N. C., Dinu, L., Kirkman, A., & Hughes, G. (2020). Predicting stress and mental wellbeing among doctoral researchers. *Journal of Mental Health*, 31(6), 783–791. <https://doi.org/10.1080/09638237.2020.1818196>
- Cantwell, R. H., Bourke, S. F., Scevak, J. J., Holbrook, A. P., & Budd, J. (2017). Doctoral candidates as learners: A study of individual differences in responses to learning and its management. *Studies in Higher Education*, 42(1), 47–64. <https://doi.org/10.1080/03075079.2015.1034263>
- Cargill, M., & Smernik, R. (2016). Embedding publication skills in science research training: A writing group programme based on applied linguistics frameworks and facilitated by a scientist. *Higher Education Research and Development*, 35(2), 229–241. <https://doi.org/10.1080/07294360.2015.1087382>
- Carr, E. C. J., & Galvin, K. T. (2005). Doctoral preparation: Issues and relevance for clinical leaders. *Journal of Research in Nursing*, 10(6), 601–624. <https://doi.org/10.1177/174498710501000604>
- Chatterjee-Padmanabhan, M., & Nielsen, W. (2018). Preparing to cross the research proposal threshold: A case study of two international doctoral students. *Innovations in Education and Teaching International*, 55(4), 417–424. <https://doi.org/10.1080/14703297.2016.1251331>
- Clewell, B. C. (1987). Retention of black and hispanic doctoral students. *ETS Research Report Series*, 1, i–89. <https://doi.org/10.1002/j.2330-8516.1987.tb00214.x>
- Cronley, C., Black, B., & Killian, M. (2019). Teaching note-preparing doctoral students to confront the grand challenges: Strengthening baseline statistical skills. *Journal of Social Work Education*, 55(2), 389–395. <https://doi.org/10.1080/10437797.2018.1544520>
- Cuthbert, D., Spark, C., & Burke, E. (2009). Disciplining writing: The case for multi-disciplinary writing groups to support writing for publication by higher degree by research candidates in the humanities, arts and social sciences. *Higher Education Research & Development*, 28(2), 137–149. <https://doi.org/10.1080/07294360902725025>
- Department of Education. (2018). *Higher degrees by research completions cohort analysis, 2007–2017*. <https://www.dese.gov.au/higher-education-statistics/resources/completions-rates-higher-degree-research-students-cohort-analysis-2007-2017>
- Department of Education. (2021). *Research training program: Research block grants*. <https://www.dese.gov.au/research-block-grants/research-training-program>
- Deveny, C. (2016). *Use your words: A myth-busting, no-fear approach to writing*. Black Inc Books.

- DeWitty, V. P., Tabloski, P. A., Millett, C. M., Hambrick, M. E., Shreffler, M., Downing, C. A., & Huerta, C. G. (2016). Diversifying the pipeline into doctoral nursing programs: Developing the doctoral advancement readiness self-assessment. *Journal of Professional Nursing, 32*(5), 68–75. <https://doi.org/10.1016/j.profnurs.2016.03.002>
- Drennan, J., & Clarke, M. (2009). Coursework master's programmes: The student's experience of research and research supervision. *Studies in Higher Education, 34*(5), 483–500. <https://doi.org/10.1080/03075070802597150>
- Drisko, J. W., & Evans, K. (2018). How prepared are MSW graduates for doctoral research? Views of PhD research faculty. *Journal of Teaching in Social Work, 38*(2), 198–213. <https://doi.org/10.1080/08841233.2018.1441940>
- Due, C., Zambrano, S. C., Chur-Hansen, A., Turnbull, D., & Niess, C. (2015). Higher degree by research in a foreign country: A thematic analysis of the experiences of international students and academic supervisors. *Quality in Higher Education, 21*(1), 52–65. <https://doi.org/10.1080/13538322.2015.1032002>
- Eisenhart, M., & DeHaan, R. L. (2005). Doctoral preparation of scientifically based education researchers. *Educational Researcher, 34*(4), 3–13. <https://doi.org/10.3102/0013189X034004003>
- Gardiner, M., & Kearns, H. (2010). *Turbocharge your writing: How to become a prolific academic writer*. Thinkwell.
- Green, E. (2016). “Half the fun is getting there”: A beginner's guide to doctoral study. *Nurse Researcher, 23*(6), 26–30. <https://doi.org/10.7748/nr.2016.e1446>
- Guerin, C., Jayatilaka, A., & Ranasinghe, D. (2015). Why start a higher degree by research? An exploratory factor analysis of motivations to undertake doctoral studies. *Higher Education Research and Development, 34*(1), 89–104. <https://doi.org/10.1080/07294360.2014.934663>
- Guo, F., Kang, N., & Shi, J. (2018). Preparation for the scholar's role: First-year doctoral students in Tsinghua University. *Asia Pacific Education Review, 19*(2), 169–185. <https://doi.org/10.1007/s12564-018-9529-6>
- Hall, J. D., Harrell, J. R., Cohen, K. W., Miller, V. L., Phelps, P. V., & Cook, J. G. (2016). Preparing post baccalaureates for entry and success in biomedical PhD programs. *CBE Life Sciences Education, 15*(3), ar27. <https://doi.org/10.1187/cbe.16-01-0054>
- Hazell, C. M., Chapman, L., Valeix, S. F., Roberts, P., Niven, J. E., & Berry, C. (2020). Understanding the mental health of doctoral researchers: A mixed methods systematic review with meta-analysis and meta-synthesis. *Systematic Reviews, 9*(1), 197–197. <https://doi.org/10.1186/s13643-020-01443-1>
- Hey-Cunningham, A. J., Ward, M.-H., & Miller, E. J. (2021). Making the most of feedback for academic writing development in postgraduate research: Pilot of a combined programme for students and supervisors. *Innovations in Education and Teaching International, 58*(2), 182–194. <https://doi.org/10.1080/14703297.2020.1714472>
- Hockey, J. (1994). New territory: Problems of adjusting to the first year of a social science PhD. *Studies in Higher Education, 19*(2), 177–190. <https://doi.org/10.1080/03075079412331382027>
- Jackman, P. C., Sanderson, R., & Jacobs, L. (2021). Developing inductions to support mental health and wellbeing in doctoral researchers: Findings from a qualitative co-design study with doctoral researchers and university stakeholders. *European Journal of Higher Education. https://doi.org/10.1080/21568235.2021.1992293*
- Jepsen, D. M., Varhegyi, M. M., & Edwards, D. (2012). Academics' attitudes towards PhD students' teaching: Preparing research higher degree students for an academic career. *Journal of Higher Education Policy and Management, 34*(6), 629–645. <https://doi.org/10.1080/1360080X.2012.727706>
- Kift, S. (2015). A decade of Transition Pedagogy: A quantum leap in conceptualising the first year experience. *HERDSA Review of Higher Education, 2*, 51–86.
- Kiley, M., Boud, D., Manathunga, C., & Cantwell, R. (2011). Honouring the incomparable: Honours in Australian universities. *Higher Education, 62*(5), 619–633. <https://doi.org/10.1007/s10734-011-9409-z>
- Kiley, M., & Cumming, J. (2014). The impact of changing government policies and institutional practices on master's by coursework students in Australia: A viable pathway to the PhD? *Journal of Higher Education Policy and Management, 36*(1), 99–111. <https://doi.org/10.1080/1360080X.2013.861052>
- Kiley, M., & Cumming, J. (2015). Enhanced learning pathways and support for coursework master's students: Challenges and opportunities. *Higher Education Research and Development, 34*(1), 105–116. <https://doi.org/10.1080/07294360.2014.934335>

- Kiley, M., Moyes, T., & Clayton, P. (2009). 'To develop research skills': Honours programmes for the changing research agenda in Australian universities. *Innovations in Education and Teaching International*, 46(1), 15–25. <https://doi.org/10.1080/14703290802646164>
- Kwan, B. S. C. (2009). Reading in preparation for writing a PhD thesis: Case studies of experiences. *Journal of English for Academic Purposes*, 8(3), 180–191. <https://doi.org/10.1016/j.jeap.2009.02.001>
- Lovitts, B. E. (2008). The transition to independent research: Who makes it, who doesn't, and why. *The Journal of Higher Education*, 79(3), 296–325. <https://doi.org/10.1080/00221546.2008.11772100>
- Luedke, C. L., Collom, G. D., McCoy, D. L., Lee-Johnson, J., & Winkle-Wagner, R. (2019). Connecting identity with research: Socializing students of color towards seeing themselves as scholars. *Review of Higher Education*, 42(4), 1527–1547. <https://doi.org/10.1353/rhe.2019.0074>
- Ma, L. P. F. (2021). Writing in English as an additional language: Challenges encountered by doctoral students. *Higher Education Research and Development*, 40(6), 1176–1190. <https://doi.org/10.1080/07294360.2020.1809354>
- Mackie, S. A., & Bates, G. W. (2019). Contribution of the doctoral education environment to PhD candidates' mental health problems: A scoping review. *Higher Education Research and Development*, 38(3), 565–578. <https://doi.org/10.1080/07294360.2018.1556620>
- Mahmud, S., & Bretag, T. (2013). Postgraduate research students and academic integrity: "It's about good research training." *Journal of Higher Education Policy and Management*, 35(4), 432–443. <https://doi.org/10.1080/10360080X.2013.812178>
- Manathunga, C., Kiley, M., Boud, D., & Cantwell, R. (2012). From knowledge acquisition to knowledge production: Issues with Australian honours curricula. *Teaching in Higher Education*, 17(2), 139–151. <https://doi.org/10.1080/13562517.2011.590981>
- Martinez, A. (2018). Pathways to the professoriate: The experiences of first-generation latino undergraduate students at hispanic serving institutions applying to doctoral programs. *Education Sciences*, 8(1), 32. <https://doi.org/10.3390/educsci8010032>
- McAlpine, L. (2012). Shining a light on doctoral reading: Implications for doctoral identities and pedagogies. *Innovations in Education and Teaching International*, 49(4), 351–361.
- McCoy, D. L., & Winkle-Wagner, R. (2015). Bridging the divide: Developing a scholarly habitus for aspiring graduate students through summer bridge programs participation. *Journal of College Student Development*, 56(5), 423–439.
- McCray, J., & Joseph-Richard, P. (2020). Towards a model of resilience protection: Factors influencing doctoral completion. *Higher Education*, 80(4), 679–699. <https://doi.org/10.1007/s10734-020-00507-4>
- McDowall, A., & Ramos, R. (2018). Doing decoloniality in the writing borderlands of the PhD. *The Australian Journal of Indigenous Education*. <https://doi.org/10.1017/jie.2017.23>
- Milos, D. (2019). Embedding transferable skills into the higher degree by research candidature. *Studies in Graduate and Postdoctoral Education*, 10(3), 173–179. <https://doi.org/10.1108/SGPE-04-2019-0046>
- Mohamed, A. T. F. S., Amir, A. F., Ab, N. K., Rahman, E. A., Rahman, A. Q., & Nasir, A. (2020). Preparing for PhD: Exploring doctoral students' preparation strategy. *Studies in Graduate and Postdoctoral Education*, 11(1), 89–106. <https://doi.org/10.1108/SGPE-03-2019-0038>
- Moore, S. E., Hines-Martin, V. P., & Gattis, M. N. (2020). Paying it forward: The role of senior black faculty in preparing junior faculty and black doctoral students for career success. *The Journal of Negro Education*, 89(2), 146–157. <https://doi.org/10.7709/jnegroeducation.89.2.0146>
- Naylor, R., Chakravarti, S., & Baik, C. (2016). Differing motivations and requirements in PhD student cohorts: A case study. *Issues in Educational Research*. <https://doi.org/10.3316/aeipt.213872>
- Nettles, M. T. (1990). Success in doctoral programs: Experiences of minority and white students. *American Journal of Education*, 98(4), 494–522.
- Owens, A., Brien, D. L., McAllister, M., Batty, C., Carson, S., & Tuckett, A. (2019). Researching, implementing, and evaluating industry focused and cross-disciplinary doctoral training. *International Journal of Doctoral Studies*, 14, 651–671. <https://doi.org/10.28945/4422>
- Pallas, A. M. (2001). Preparing education doctoral students for epistemological diversity. *Educational Researcher*, 30(5), 1–6. <https://doi.org/10.3102/0013189X030005006>
- Porter, A. C., & Polikoff, M. S. (2012). Measuring academic readiness for college. *Educational Policy*, 26(3), 394–417. <https://doi.org/10.1177/0895904811400410>

- Reid, M. J., & Moore, J. L. (2008). College readiness and academic preparation for postsecondary education: Oral histories of first-generation urban college students. *Urban Education, 43*(2), 240–261. <https://doi.org/10.1177/0042085907312346>
- Salerno, J. P., Gonzalez-Guarda, R., & Hooshmand, M. (2017). Increasing the pipeline and diversity of doctorally prepared nurses: Description and preliminary evaluation of a health disparities summer research program. *Public Health Nursing, 34*(5), 493–499. <https://doi.org/10.1111/phn.12341>
- Schmidt, M., & Hansson, E. (2018). Doctoral students' well-being: A literature review. *International Journal of Qualitative Studies on Health and Well-Being, 13*(1), 1–14. <https://doi.org/10.1080/17482631.2018.1508171>
- Schwartz, B. N., & Walden, W. D. (2012). From doctoral student to faculty member: PhD project alumni's evaluation of their preparedness. *Journal of Diversity Management, 7*(1), 35–45. <https://doi.org/10.19030/jdm.v7i1.6934>
- Shaw, K., Holbrook, A., & Bourke, S. (2013). Student experience of final-year undergraduate research projects: An exploration of "research preparedness." *Studies in Higher Education, 38*(5), 711–727. <https://doi.org/10.1080/03075079.2011.592937>
- Skakni, I. (2018). Doctoral studies as an initiatory trial: Expected and taken-for-granted practices that impede PhD students' progress. *Teaching in Higher Education, 23*(8), 927–944. <https://doi.org/10.1080/13562517.2018.1449742>
- Son, J. -B., & Park, S. -S. (2014). Academic experiences of international PhD students in Australian higher education: From an EAP program to a PhD program. *International Journal of Pedagogies & Learning, 9*(1), 26–37. <https://doi.org/10.1080/18334105.2014.11082017>
- Stehlik, T. (2011). Launching a career or reflecting on life? Reasons, issues and outcomes for candidates undertaking PhD studies mid-career or after retirement compared to the traditional early career pathway. *Australian Journal of Adult Learning, 51*, 150–169.
- Sverdlik, A., Hall, N. C., McAlpine, L., & Hubbard, K. (2018). The PhD experience: A review of the factors influencing doctoral students' completion, achievement, and well-being. *International Journal of Doctoral Studies, 13*, 361–388. <https://doi.org/10.28945/4113>
- Tynan, L., & Johns, K. (2015). Piloting the post-entry language assessment: Outcomes from a new system for supporting research candidates with English as an additional language. *Quality in Higher Education, 21*(1), 66–78. <https://doi.org/10.1080/13538322.2015.1049442>
- Usher, W., & McCormack, B. A. (2021). Doctoral capital and well-being amongst Australian PhD students: Exploring capital and habitus of doctoral students. *Health Education, 121*(3), 322–336. <https://doi.org/10.1108/HE-11-2020-0112>
- Valencia-Forrester, F. (2019). Internships and the PhD: Is this the future direction of work-integrated learning in Australia? *International Journal of Work-Integrated Learning, 20*(4), 389–400.
- Velander, S., Silva Martinelli, F., Idam Sari, D., Ali, F., & Biber-Freudenberger, L. (2021). A dichotomy of domestic and academic pathways: Challenges of motherhood in an international doctoral program on land science. *Journal of Land Use Science*. <https://doi.org/10.1080/1747423X.2021.2015002>
- Waight, E., & Giordano, A. (2018). Doctoral students' access to non-academic support for mental health. *Journal of Higher Education Policy and Management, 40*(4), 390–412. <https://doi.org/10.1080/1360080X.2018.1478613>
- Warburton, J., & Macauley, P. (2014). Wrangling the literature: Quietly contributing to HDR completions. *Australian Academic and Research Libraries, 45*(3), 159–175. <https://doi.org/10.1080/00048623.2014.928992>
- Williamson, C. (2016). "Views from the nano edge": Women on doctoral preparation programmes in selected African contexts. *Studies in Higher Education, 41*(5), 859–873. <https://doi.org/10.1080/03075079.2016.1147728>
- Young, L. J. (2001). Border crossings and other journeys: Re-envisioning the doctoral preparation of education researchers. *Educational Researcher, 30*(5), 3–5. <https://doi.org/10.3102/0013189X03000503>
- Zeivots, S. (2021). Outsiderness and socialisation bump: First year perspectives of international university research students. *Asia Pacific Journal of Education, 41*(2), 385–398. <https://doi.org/10.1080/02188791.2020.1779028>

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Ailie McDowall is a Senior Lecturer in Indigenous Studies and convenes the Higher Degree by Research programs at the Indigenous Education and Research Centre, James Cook University. Her research interests are in higher education and research education, with a particular interest in the education of post-graduate research students.

Fabiane Ramos is a Lecturer in the tertiary pathways program at USQ College, University of Southern Queensland. Her current research focus is on widening participation in higher education and transition pedagogies, with a particular interest in inclusive pedagogical practices for CALD (culturally and linguistically diverse) students.