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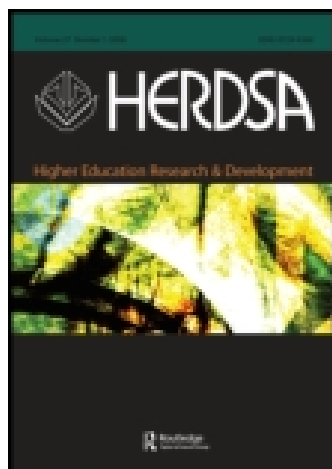
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The purpose of the PhD: theorising the skills acquired by students

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In the past decade there has been a marked push for the development of employability skills to be part of the PhD process. This push is generally by stakeholders from above and outside the PhD process, i.e. government and industry, who view skills as a *summative product* of the PhD. In contrast, our study interviewed stakeholders inside the PhD process – twenty final-year, full-time Australian PhD students – to provide a bottom-up perspective into the skills question. Using grounded theory procedures we theorise the skills students develop during the PhD as a *formative developmental process* of acquiring intellectual virtues. Drawing on Aristotelian theory, we propose that theorising the PhD as a process of acquiring intellectual virtues offers a more robust and conceptually richer framework for understanding students' development during the PhD than the instrumental focus on skills evident in contemporary debates.

Keywords: Aristotle; doctorate; intellectual virtues; PhD; skills

Introduction

The PhD is the pinnacle of university learning and scholarship but a swelling questioning of the real-world value of the PhD testifies to the epistemological ambiguities surrounding the contemporary purpose of the PhD. Government, business and industry leaders complain that PhD graduates lack the skills required for the labour markets of contemporary economies and have challenged the relevance of the PhD, given the reduced opportunities for academic work universities and increasing number of PhD graduates (Halse, 2007; Peters, 2007). The need to clarify the purpose of the PhD has been a reoccurring theme in experts' reports in the UK for more than two decades (Park, 2007; Poole, Harman, & Deden, 1998) and was a key goal of the Carnegie Initiative on the Doctorate in the USA (Walker et al., 2008).

Universities in Western countries have responded with what we term the 'skills push'. They have incorporated skills training into doctoral programs with the specific aim of equipping graduates for future employment to ensure that they can contribute to the economic development of the nation (Meek, Teichler, & Kearney, 2009; Peters, 2007). In the UK, for example, the UK Research Council and Arts and Humanities Research Board (UKAHRB) (2001) issued a *Joint statement of skills training requirements of research postgraduates* to ensure that graduates have the skills needed for careers beyond the academy (Park, 2007). In Australia, a report by the Commonwealth's Department of Education, Science and Training has prescribed the generic capabilities

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it considers necessary for success in the research workplace and in potential future employment (Borthwick & Wissler, 2003).

The skills push articulates its normative expectations of PhD graduates through lists of skills, attributes, competencies and dispositions. Characteristically, these include (but are not limited to): disciplinary knowledge; research and technical skills; project management and leadership skills; teaching competence; the capacity to communicate verbally and in writing; effectiveness as a team player and as an autonomous self-manager; administrative competence; and the capacity to be an ethical, adventurous, innovative, motivated, creative and flexible individual (Borthwick & Wissler, 2003; Council Of Australian Deans and Directors of Graduate Studies (DDoGS), 1999; Nyquist & Woodford, 2000; UKAHRB, 2001). As commentators have observed, such lists represent a ‘daunting’ set of expectations and competencies (Nyquist, 2002, p. 19) and are so extensive that it is questionable whether they can be met within the parameters of a PhD (Craswell, 2007; Richardson, 2006).

Our concern is with the epistemological ambiguities about the purpose of the PhD entangled in the skills push. Government and university policy documents reveal that there is no consensus about the *meaning* of the word ‘skills’ and it is used as a synonym for strikingly different abilities, attributes, qualities, sensibilities and competencies (Gilbert, Balatti, Turner, & Whitehouse, 2004). Nor is there agreement on *what* skills doctoral study *should* develop. Research by the European Universities Association (Borrell-Damian, 2009), for example, found that governments and industry leaders not only disagree on the specific skills that they want graduates to develop but are uncertain about the universality or specificity of particular skills, research methods and approaches for different disciplines and divided on whether skills for research and employment are binaries or complementary capacities. Furthermore, skills advocates stress the importance of the transferability of skills from the PhD to the workplace but this presumes a seamless, *linear transference* from instruction to mastery and workplace application. It ignores that students enter the PhD with pre-existing skills and capabilities (Barnacle & Usher, 2003) and that the transference of skills from the PhD to the post-doctoral workplace cannot be guaranteed because this is always mediated by graduates’ career/life choices, personal circumstances and the vagaries of employment markets.

Inherent in the epistemological problems underpinning the skills push is a disregard for the multidimensionality of the doctorate (Pearson, Evans, & Macauley, 2008) that overlooks the development of capacities such as engagement, motivation, perseverance, resilience, innovation and creative thinking (Barnett, 2007; Dall’Alba & Barnacle, 2007; Lovitts, 2005, 2008). Such capacities are crucial in shaping productive workers and effective citizens and developing the disposition for lifelong learning that is a key human capital return to the nation of investing in doctoral education (Allen Consulting Group, 2005; Becker, 1993). Nevertheless, the skills push continues to *define and redefine* the purpose of the PhD. In Australia, for example, a dominant government discourse of the PhD is as the timely production of a particular, marketable *product* – the skilled PhD graduate – who will contribute to the economic growth of the nation (Usher, 2002).

The research problem

Our study with students was one part of a larger project, with colleagues examining the perspective of a range of stakeholders, including doctoral supervisors, government

and business and industry leaders, on the skills and the purpose of the PhD. The problem that we address in this article is whether there is a different (and better) way of theorising the purpose of the PhD and the skills students develop during the PhD. Adopting the broad definition of skills as the acquisition or development of specific capacities, abilities, aptitudes or competencies (Gilbert et al., 2004), our article addresses two questions: what skills do current doctoral students report developing during their PhD; and how might the *process* of skills acquisition be theorised in a broader context of uncertainty about the purpose and value of the PhD?

We tackled this task by examining the skills that *currently enrolled final year PhD students* reported *acquiring or improving* during candidature that they considered of value for completing the doctoral process and for their (anticipated) post-doctoral lives. Our aim was to access the insights of a group who are often the object of, but rarely participants in, the skills debate; and to offer a standpoint to counter government, industry and business agendas that have steered the skills push to date. In this respect, our article takes up the call for more nuanced insights into the doctoral process (Pearson et al., 2008) and the development of a conceptual framework and theory that captures the skills and capacities developed *during* the doctoral study (Allen Consulting Group, 2005).

Methods

Participants

Our study involved in-depth interviews with full-time, final-year PhD students enrolled at a large metropolitan university in Sydney, Australia. In contrast to North America, the Australian PhD is a research degree based on the Oxbridge model and without assessable coursework components. We focused on full-time, final-year PhD students because the PhD in Australia continues to attract a larger percentage of enrolments than other doctoral degrees, including professional doctorates, despite the development of different doctoral models and increased part-time enrolments (Evans, 2002).

Our participants were 15 female and 5 male students who ranged in age from their early-20s to over 50 years with the majority (14) being between 30 and 40 years old. The ratio of females to males was higher than the national patterns but our sampling logic was not statistical representativeness but theoretical saturation, whereby recruitment continued until no new concepts or categories emerged during data analysis and theory generation. Students were drawn from the Colleges of Business (2), Health and Sciences (8) and Arts (10), the latter consisting of students from Psychology, Education and the Humanities. In recognition that an overly zealous focus on differences can obscure important commonalities, we deliberately solicited a cross-disciplinary sample in order to identify areas of skills development shared by *all* students across a broad range of disciplines.

Data collection

In-depth, semi-structured interviews were conducted in which students were invited to describe the skills that they believed they developed or improved during the doctoral process and how these were developed and contributed to their personal and professional growth. The recursive model of interviewing was used whereby the interview proceeds as a conversation. This approach enabled students to raise issues of

personal significance and allowed us to access insights into students' experiences during their PhD, particularly the formal and informal learning that contributed to skills development (Minichello, Aroni, Timewell, & Alexander, 1990).

Data analysis

Our aim was to develop a student-driven theory of the purpose of the PhD through an analysis of the areas of skills development that were a priority for students. For this reason we utilised the inductive and deductive procedures of grounded theory described by Strauss and Corbin (1998). Interviews were recorded and transcribed, coded and then grouped into 49 concepts or areas of skills development that were subsequently sorted into seven categories or broad groups of similar concepts to generate a theory of the purpose of the PhD. The seven categories (or broad areas of skills development) were personal resourcefulness, cognition, research skills, workplace and career management, leadership and organization, written and oral communication and project management.

Consistent with grounded theory, memoing was an important tool in our analysis for theorising the codes and their theoretically coded relationships. Our sorted memos revealed that skill acquisition occurs through formal instruction and informal learning that occurred both within and beyond the university and at all stages of the doctorate. Further, the same areas of skills were improved or acquired by all PhD students, although students' competency was contingent on students' personal history, discipline or experiences. In general terms, the skills articulated by students paralleled the skills that policy makers consider desirable outcomes of doctoral education, such as the acquisition of disciplinary knowledge, research skills and communication and project management skills (DDoGS, 1999; Nyquist & Woodford, 2000; UKAHRB, 2001). The one exception to this rule was personal resourcefulness (personal and social capacities). Personal resourcefulness or a similar suite of skills rarely appears in university and government policies about the doctorate or in the skills advocated by business and industry, yet this was the category of skills most valued by students. It involved developing the confidence, discipline, intrinsic motivation, resilience, tenacity and interpersonal skills that enabled students to balance the institutional, professional and personal responsibilities occurring during the PhD.

Our memos highlighted the close connection between categories of skills. Rather than being discrete and independent, each category of skills shaped and was shaped by other categories. For example, the specific sort of research skills developed by students influenced the types of workplace and career management strategies they used, the sorts of project management and communication skills they developed, and the forms of personal resourcefulness they acquired to manage their personal and professional lives. The recognition that the skills developed during the PhD are inter-related and mutually dependent is contrary to a common articulation of PhD skills – including in universities such as our own – as discrete capacities disconnected from other experiences during the doctorate.

Discussion: theorising skills development during the PhD

The goal of our analysis was to generate a workable theory to elucidate the relationship between the categories that emerged from the data. During our interrogation of the data, we heeded Strauss and Corbin's (1998) advice to continually engage with

relevant literature in order to generate new theoretical insights. In contrast to Glaser (1998), Strauss and Corbin (1998) argue that a plausible relationship between analysis and theory legitimates and warrants the appropriation of existing theories to elucidate a grounded analysis. As a result of our wider reading on skill acquisition, particularly Dreyfus and Dreyfus (1986) and Dreyfus (2001), we explored the value of Aristotle's intellectual virtues (*arête*), described in *Nicomachean ethics* Book VI (Aristotle, 2002), for informing our generation of a theory of the PhD.

The intellectual virtues are commonly rendered as: practical knowledge (*phronesis*); theoretical knowledge (*sophia*); scientific knowledge (*epistêmê*); productive knowledge (*technê*); and intuitive knowledge (*nous*). For Aristotle, the virtues are not discrete capacities but complementary, interdependent parts of a whole. *Sophia* and *epistêmê* are both part of the theoretical/thinking part of the soul (*epistêmikon*); *technê* and *phronesis* are concerned with the practical/feeling part of the soul (*logisticon*); and *nous* or intuitive knowledge encompasses both *epistêmikon* and *logisticon* because of its capacity to discover theoretical principles and learn from experience to inform practical knowledge (Pakaluk, 2005). Because the virtues are interrelated and interdependent, Broadie and Rowe (2002) argue that they coalesce conceptually into the three domains of *phronesis* (productive knowledge), *sophia* (intellectual knowledge) and *technê* (productive knowledge). To capture the interrelatedness of the virtues, Nussbaum (1986) uses the metaphor of 'a crown full of valuable jewels, in which each jewel has an intrinsic value in itself and the whole composition also adds to the value of each' (p. 374).

The relevance of the virtues for interpreting contemporary human experience has been widely recognised by scholars. They have been used to counter scientific rationality and technical instrumentalisation in theorising management practices and professional expertise (Dreyfus & Dreyfus, 1980; Gadamer, 1984; Kemmis, 2005; Schwandt, 2002), ethical practice (Crisp & Slote, 1997; MacIntyre, 2007), the social sciences (Eikeland, 2008; Flyvbjerg, 2004; Greenwood & Levin, 2005; Tabachnick, 2004) and educational practice and research (Carr, 2003; Carr & Kemmis, 1986; Eisner, 2002; Saugstad, 2002). Building on such initiatives, the following discussion extends recent theorising of Aristotle's intellectual virtues to a new area – the practice of the PhD.

Developing personal resourcefulness – the acquisition of phronesis

Personal resourcefulness is the term we use to describe the growth in practical knowledge that students acquire during the PhD and the capacity students develop to act on this knowledge. Personal resourcefulness can be understood as the acquisition of skills that enable students to become more assertive, confident, resilient, persistent and resolute in determining how to progress their PhD while balancing their other commitments. Consequently, personal resourcefulness is the reflexive, perceptual, emotional and contextual capacity that students develop during the PhD and that they used to discern and guide their actions.

For many students, learning how to manage the positive and negative events in their personal (outside-of-university) and professional (university) lives was fundamental to the development of personal resourcefulness:

The educational process isn't just academic. I found that I was acutely aware that there was a significant amount of personal growth that I needed to do in conjunction with meeting the day-to-day challenges of doing the PhD. (Ros)¹

Regardless of discipline, gender or age, students considered their personal and professional lives to be intricately entwined. However, students recognised that they needed to develop skills in balancing the competing demands of work and life. As Oliver explained: ‘and then there’s the personal stuff ... learning how to fit PhD candidature into family life [and] into personal life in terms of relationships’.

Students described numerous events and circumstances that fostered their personal resourcefulness but commented particularly on the positive impact of participating in a collegial, scholarly community. In such an environment, students were able to develop their abilities to present ideas, experiment with ways of thinking and arguments and build their capacity and confidence to engage in different settings within and beyond the university. Students’ accounts not only demonstrated the social nature of learning but also the nourishing effects of scholarly communities on their intellectual and personal growth:

Sociality is critical to my intellectual life. I know what the limits of my thinking are and the limits of my capacity to analyse, argue, speculate, imagine ... and so in relationships with others, those limits are tested, expanded, strengthened. I think there’s a set of intellectual skills that only emerge through that sociality. (James)

Hindess (1995) contends that, ‘the most important function of the university is to promote the formation of a society of individuals who can be relied on, for the most part, to regulate [discipline] their own behaviour in an appropriate fashion’ (p. 44). Coping with the contingencies, contradictions and complications of everyday life *and* meeting the commitments of a PhD required students to develop a high-level of expertise and self-discipline. For all students, the most useful and cherished skill developed during the PhD was the capacity to recognise and manage competing responsibilities. This included learning to: establish priorities; develop an effective work regime; manage their time; take control of situations to ensure goals were met; establish boundaries between different areas of their lives; and balance their responsibilities to their PhD, supervisors, university, families and friends in ways that protected their own physical, intellectual, social and emotional health and wellbeing. Yet, like any skill, self-discipline is not acquired easily or painlessly:

I’ve struggled to discipline myself. I don’t think that it’s that I haven’t succeeded ... I’m very well organised. I’m organised in a practical way, I’m organised in my thinking, it’s you know, disciplining my fear. So that’s what I mean about struggling ... disciplining myself not to worry about that. (Susannah)

Doing a PhD is an intense experience that can trigger anxiety, stress and self-doubt. In contrast to the literature that stresses the traumatic and debilitating effects of the PhD (Bartlett & Mercer, 2001; Lee & Williams, 1999), our data revealed that the struggles, setbacks and negative experiences during the PhD can have important, productive and positive impacts. The negative experiences during candidature improved students’ understanding of the world and strengthened their confidence, tenacity and preparedness to address problems and take risks. It was through such experiences that students developed the experiential knowledge and emotional resilience to become creative, resourceful problem-solvers who could calmly and innovatively surmount new difficulties.

Managing supervision was a challenge experienced by many students. Characteristically, students commenced the PhD anticipating a close and constant supervisory

relationship. In contrast, many experienced their supervisors as unsupportive and disengaged. Supervisors were often too busy to meet or seemed to be continually absent on study, conference, research or other leave. Some supervisors disappeared entirely by relocating to another university. A second common challenge was coping with inadequate departmental or institutional support. Such support is a key facilitator of PhD progression and completion (Leonard, Becker, & Coate, 2005; Lovitts, 2008) yet students described seemingly constant battles for adequate resources, funding, equipment and work space with unsupportive, even antagonistic, administrative systems and staff:

... you have to fight every inch of the way. You have to fight for every cent you get; for every square inch of desk you can use ... it's a constant battle, constant ... and it is incredibly tiring. (Beth)

On the other hand, students found working through such supervision and support difficulties to be a productive process even if the resolution was not optimum or students' problems were not fully resolved. The experiential knowledge gained from addressing supervisory difficulties increased students' capacity to understand particular situations and to determine appropriate, practical responses. These skills nurtured students' confidence in managing problems and willingness to resolve workplace challenges. For example, after a lengthy, difficult time struggling with unsupportive supervisors, Beth took the initiative to find a solution by calling a meeting with her supervisors and telling them that the difficulties in their relationship were affecting her work.

Students explained that overcoming the daily challenges encountered during a PhD equipped them with the practical knowledge to manage different situations effectively. Their assessment echoes Aristotle's view that the challenges of daily life can build the capacities of individuals (1104a30)² and also demonstrates the self-perception that testifies to the development of *phronesis* – the practical, reflective knowledge gained through experience over time of how to act in particular circumstances (Gallagher, 1993). As Kim describes below, students *recognised in themselves* a greater capacity to distinguish what impeded or facilitated their progress, make good choices and act upon their decisions:

I've really been pushed. ... It's a process of learning that has made me realise I do have a brain, I can organise my thoughts, I can express my creativity. I've got more self-belief, and I know that what I can offer does have value ... that's been the best thing for me ... I [feel] more worthwhile as a person ... my self-esteem is so much better now and my self-confidence and my belief in taking a risk and trying something that may not work out. I feel more confident about doing that in the future. Now I'm much more 'I'll try anything'. I feel that it's worth taking the risk because things can come from it that you would never believe possible. (Kim)

For students, the acquisition of personal resourcefulness (*phronesis*) was a progressive and cumulative process of personal and professional growth that increased their self-confidence, tenacity and resilience and permeated all areas of their lives. The capacity of students to reflect on their specific circumstances and to identify the links between their particular and general knowledge generated the understanding required to think and act in accordance with what is good or bad for oneself and others (1140b5-10). Such skills, captured within the category of personal resourcefulness in our analysis, speak of the reflective, lived knowledge gained through experience that informs and shapes individuals' decisions and actions (*phronesis*).

Developing cognition – the acquisition of sophia

Cognition is commonly understood as the process of perceiving or knowing. For the students in our study, the acquisition of cognitive skills (the capacity to perceive and know) involved developing their knowledge and understanding and accumulating skills in generating and applying new knowledge, theories and concepts. Central to this process was the development of critical thinking skills. These involved the ability to scrutinise and synthesise ideas and information, recognise different points of view, appropriate theory and use more sophisticated theoretical insights to interpret data and support analyses and conclusions. As one student explained:

I think the real point or strength that you get from doctoral study is it develops your ability to think critically and to see things from different points of view. I mean so often we can only imagine things in our own way, our own way of doing things and I think that doing a doctorate teaches you how to approach a problem from many different aspects. (Elizabeth)

All students confessed that this intellectual work was difficult. In the early stages of candidature, developing cognition was ‘a big thing to struggle with intellectually ... to work out exactly how I’m dealing with it ... it’s been difficult’ (Susannah). For some students, like Elizabeth, it was experienced as ‘lots of little moments when you’re struggling with something and then it just comes together’. For others it involved repeatedly revisiting ideas and information:

Sometimes it took me a while to understand but I think that that’s part of the learning experience. If I didn’t get something then I’d review what I’d written and I’d think about it some more or maybe do something else. Eventually I would get there. (Lauren)

Nevertheless, *all* students across *all* disciplines described the development of their cognitive skills as a source of joy, delight and satisfaction that assuaged the hard grind of the PhD. The duration, frequency and intensity of their happiness varied but, for some students, it was a life transforming experience:

You have to make a choice: ‘How do I see my data? How do I structure my epistemology? How do I understand knowing the truth?’... That changes the way that you view things around you. That’s one of the reasons I think why doing a PhD leads to restructuring your thinking, changing your life. (Jan)

Barnett (2007) describes an authentic higher education as one that requires students to take responsibility for their learning. This involves ‘hard work ... courage, the capacity to stand alone ... persistence and resilience’ (p. 43). Taking responsibility for their own learning was often a source of stress and anxiety for the students. Nevertheless, they reported that meeting this challenge enabled them to develop better understandings of concepts, distinguish nuanced connections between their data and wider theories and recognise how ideas might fit together in innovative ways. In short, doing a PhD developed their cognitive skills.

In Aristotelian terms, this process corresponds to the acquisition of *sophia* – the wisdom produced by combining the knowledge generated through scientific ways of knowing (*epistêmê*) with the intuitive skills gained through experience (*nous*) (1141a15-20). *Sophia*, however, is more than intellectual or intuitive, experiential knowledge. As students’ knowledge (*epistêmê*), personal resourcefulness (*phronesis*)

and experiential intuition (*nous*) developed, they were more prepared to take intellectual risks in their PhD. Intellectual risk-taking heightened students' emotional investment in their studies which, in turn, intensified their feelings of ownership over and commitment to their learning and the PhD. Secreted within the process of skills development described by students are resonances of Aristotle's conceptualisation of the emotions as a mode of recognition that inform intellectual understandings (1139a35). It is through combining *epistēmê* and *nous* with productive emotionality that the wisdom of *sophia* is constituted.

Developing research and other skills – the acquisition of technê

Students were unanimous that doing a PhD improved their technical skills in areas such as identifying and searching data bases, using specialised laboratory and computer equipment and utilising technology for analysing data and managing projects. Many students received formal instruction in these technical skills but they achieved mastery both by working on their PhD and experiences beyond their PhD, for example by working as research assistants. It was through a *range* of experiences that students: developed their project management skills; learned to determine priorities and achieve deadlines; became skilful in producing outcomes despite a limited budget, equipment failures or administrative impediments; and developed expertise in transferring their knowledge of ethical behaviour with research participants to their interactions with others within and beyond the university.

Students described how their experiences in different work contexts as employees or researchers equipped them with skills for life beyond the PhD:

Learning how to manage the project, learning how to write, improve your writing skills, getting up and talking in front of people, being able to communicate ... has been one of the greatest things ... these sorts of skills – the ability to research, basically to go and find information, to draw connections between seemingly separate fields and drawing all of those things together, I think it is an experience that has grown me as a person ... they're life skills that I don't think I would have learnt anywhere else. (Elizabeth)

The informal learning students acquired in areas unrelated to their PhD had a productive impact on the skills that students' developed as they worked on their PhD. This was explicit in students' accounts of learning to write:

Having worked on a research project and having had to write research reports; having to write summary analyses and work that up into publications ... I've learned how to structure a 7000 word article, how to maintain engagement with the reader, how to work with data in an economical way because of word limits etc. ... So those writing skills have been particularly valuable. (James)

The dynamic described by James is about more than mere skills transference. It highlights the illusionary divide between the PhD and life beyond the PhD and how the flow of skills and expertise feed the deep understanding (*sophia*) and reasoning (*phronesis*) involved in moving from technician to craftsperson. It is through this process that students produce a completed PhD – and that is at the heart of Aristotle's concept of *technê*: 'the creative, productive use of expert knowledge to bring something into existence or accomplish a particular objective and to give an account of what has been produced' (Halse & Malfroy, 2010, p. 87).

Conclusion: theorising the PhD as the acquisition of intellectual virtues

Our discussion illustrates the micro practices that generated the categories of skills that emerged from our data and how these categories relate to the Aristotelian virtues of *phronesis*, *sophia* and *technê*. A particular strength of conceptualising skills in terms of the intellectual virtues is that it captures students' experiences of skills development as a *process* of acquiring and improving an interdependent suite of skills from a range of contexts that transcend disciplinary boundaries to fashion students' personal and professional growth.

Our analysis suggests more than an alternate framework for skills development. It reframes the purpose of the PhD as the *acquisition of an interrelated suite of intellectual virtues*. Theorising the PhD in this way is not an attempt to assert an ivory-tower notion of the PhD or to disconnect the PhD from the real world. Rather, as Aristotle argued in *Nicomachean Ethics* Book VI and Nussbaum (1986, 1990) reminded us, it is through the development and application of the intellectual virtues that individuals flourish in their daily life and work and contribute to the wider human good.

We acknowledge that our theory is based on one metropolitan university in Australia and needs to be examined in other local, national and international contexts. Nevertheless, we propose that theorising the PhD as the acquisition of intellectual virtues moves beyond the limited economic agendas of the skills push. It shifts the lens from the instrumental production of the skilled PhD graduate to the progressive building of virtuous individuals who contribute to society through their productive actions. The rationale for such a theory is clear. We cannot know in advance what work opportunities will be available in the future, what skills future employers may require or how national and global developments will affect future labour markets. For these reasons, it is sensible to attend to the logic of the skills push but to avoid its excesses by rejecting its epistemological claims over the PhD. A theory of the PhD as the acquisition of intellectual virtues accomplishes this goal because it offers a theoretically rigorous language and method for capturing how students' experience the PhD while also holding open the need to accommodate an unknown future.

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Notes

1. Pseudonyms are used.
2. References to Aristotle's work follow Bekker numbering conventions.

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