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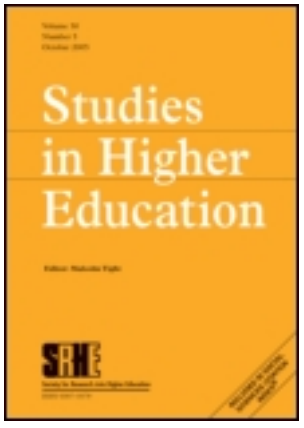

Studies in Higher Education
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/cshe20

How shall we know them? Capturing the diversity of difference in Australian doctoral candidates and their experiences

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Available online: 10 Aug 2011

To cite this article: Margot Pearson, Jim Cumming, Terry Evans, Peter Macauley & Kevin Ryland (2011): How shall we know them? Capturing the diversity of difference in Australian doctoral candidates and their experiences, Studies in Higher Education, 36:5, 527-542

To link to this article: http://dx.doi.org/10.1080/03075079.2011.594591

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Studies in Higher Education
Vol. 36, No. 5, August 2011, 527–542

Routledge
Taylor & Francis Group

How shall we know them? Capturing the diversity of difference in Australian doctoral candidates and their experiences

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Although there is general agreement that doctoral students and their experiences are diverse, in what respect this is true is in question. Most institutional practices in the collection of data in this regard have been established to satisfy government reporting requirements and concerns, such as funding, participation and equity, and efficiency. Missing is more detailed and nuanced quantitative data and analysis, complementary to those of qualitative studies, to illuminate the nature and extent of doctoral student diversity and the effects on the quality of their candidacy. Drawing on select data and findings from a national survey of Australian doctoral candidates conducted in 2005, the article questions the utility of commonly used categories for quantitative data collection and analysis, and their use as the basis of (sub)groupings to represent doctoral diversity. In so doing, it presents a more complex picture of doctoral candidature that depicts the idiosyncrasy of the individual experience, as well as generic characteristics. Central to the argument is that doctoral candidates are diversely different, bringing varying goals, expectations, career histories and family and community responsibilities beyond the academy, that shape their engagement with their candidacy.

Keywords: doctorates; doctoral education; diversity; research training; doctoral experience

Introduction

> The successful individual research experience of the doctoral student should remain at the centre of all reform attempts. (Wintermantel 2008, 1–2)

A feature of many discussions on doctoral education is the varying and sometimes unexamined perspectives on and assumptions about the nature of the contemporary doctoral candidate population. That doctoral students and their experiences are diverse is something of a truism among academic supervisors and in the literature on doctoral education. This perspective has been supported by many qualitative studies, some of them on a national scale, documenting the diversity and complexity of the doctoral experience (e.g. Delamont, Atkinson, and Parry 2000; Harman 2004; La Pidus 1997; Neumann 2003; Pearson and Ford 1997; Salmon 1992), but with limited

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ISSN 0307-5079 print/ISSN 1470-174X online
© 2011 Society for Research into Higher Education
DOI: 10.1080/03075079.2011.594591
http://www.informaworld.com

impact at the level of government or institutional policy formation. For, in parallel, in policy discussions in Australia there persists the implicit assumption of a stereotypical doctoral candidate as young, male, full-time, with few other commitments, proceeding from an honours degree and preparing for workforce entry after the doctorate, preferably as an academic. This stereotype is current elsewhere. McCulloch and Stokes (2008), writing about doctoral students in the UK, describe the stereotype of the typical doctoral student that underpins contemporary British public policy thus:

> Arguably he (and it is implicitly a 'he') is a young, full-time, funded student who is geographically mobile, without dependants, studying in a metropolitan area and intending to pursue a career as a full-time researcher or academic. (3)

Recently the stereotype has undergone some refurbishment in Australia, as the number of women enrolling in doctorates had risen to 50% in 2005 (Pearson et al. 2008), with growing acceptance that the median age is in the thirties rather than the twenties, as was first shown by Pearson and Ford (1997, 10). However, in the recent House of Representatives report in Australia (Standing Committee on Industry, Science and Innovation 2008), for example, it is of note that in the section in the report introducing the topic of 'Generic skills development and the Commercialisation Training Scheme' the statement is made that 'Submissions to the inquiry suggested that postgraduate research students may require generic skills training so that they are equipped to participate in the workforce after their studies are complete' (45). Most of these submissions were from the university sector, and they reveal that the assumption that the majority of PhD candidates are being prepared for employment is still current. This assumption leads to an undervaluing of current and prior work experience, and ignores the reality of older and mid-career professionals undertaking doctorates.

Another common assumption is that the exponential growth of doctoral populations in many parts of the world in past decades has led to increased diversity in the doctoral population and in doctoral programs. But in what respect is in question. Analyses of national data sets from 1996 and 2004 establish that, at the system level in Australia, there has been growth in the number of women doctoral students from 41% to 49% in total, across all Broad Fields of Study (BFOS), and growth in the enrolment of 'international' doctoral students; but patterns of sex, age and enrolment type across BFOS are largely unchanged, as is the distribution of doctoral enrolments across types of institution (Pearson, Evans, and Macauley 2008). The persistence of such patterns in the student population is also to be found in other countries (e.g. Sowell, Zhang, and Redd 2008).

The relationship between growth and diversity is complex, in part because there are varying concepts and definitions of diversity. Diversity can simply refer to a variety of entities within a system – that is, a static situation – or to a dynamic process of differentiation. Meek and Wood (1998) present an adaptation of a typology of categories of diversity identified by Birnbaum (1983), e.g.: different types of institutions (systemic); institutional differences due to historical/legal/other foundations (structural); differences in programs and services provided by institutions (programmatic); differences in the ways that teaching, research and/or services are provided by institutions (procedural); and differences in students served, faculty and administration (constituential). Such differences can be between institutions (external diversity) or within (internal diversity). Other perspectives on diversity and differentiation in higher education are discussed by Van Vught (2007), who outlines the arguments in the literature in favour of diversity, but argues that the introduction of increased competition in

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higher education has had unintended consequences in reducing differentiation. This argument in respect of Australia is supported by Marginson, who argues that the creation of a unified system (in 1988) and a 'quasi-market' for higher education has actually led to limited programmatic diversity – that is, differences in programs and services provided by individual institutions (Marginson 1998).

A further complicating factor is the diversity of interests involved in doctoral education. Policy discussions more usually reflect the agendas of the dominant stakeholders – the providers, funders and end users – that is, institutions, governments, business and industry and other employers (McCulloch and Stokes 2008; Pearson 2005). These dominant stakeholders are primarily focused on the production of the research and innovation that are seen to be critical for social and economic growth. Doctoral education, or (as commonly referred to in such circles) 'research training', is seen as important for producing the research capacity and higher order skills needed in a knowledge-based, post-industrial economy. Hence, governments are looking for a research capacity that is aligned with national priorities to ensure a return on what is a major investment (e.g. Association of Universities and Colleges of Canada 2008; Council of Graduate Schools, 2008; European University Association 2007; Park 2007; Standing Committee on Industry, Science and Innovation 2008). This issue has been given added urgency by concerns that there is an emerging competitive market for the pool of available talent of potential doctoral candidates and graduates (e.g. Douglass and Edelstein 2009; Smith et al. 2010).

In this global and competitive research and research training environment, policy attention has come to focus on the management of doctoral education, its efficiency, its quality assurance and the employability of graduates (a return on government investment for economic growth), leading to increasing regulation and restructuring by governments and institutions (Grant and Pearson 2007; Quality Assurance Agency 2008; Schreiterer 2008). The drive to restructure can involve proposals to change the provision and processes of doctoral education, and the structure of award programs, some of this in the name of innovation (e.g. Park 2005, 2007), but the rationale for such calls is not always clear. Pearson, Evans, and Macauley (2008, 369) argue that research on doctoral growth and change has been hampered by a conflation of issues arising from efforts to improve the quality of doctoral education, based on claims that existing awards are inflexible, poorly managed or unresponsive to newer clients, from provider-driven efforts to find new markets, and from institutional efforts to enhance reputation through involvement in research. Enders (2004, 427), summing up the tensions apparent in Europe in the drive to standardise and regulate, warns of the need not to 'neglect the coexistence of multiple small worlds of research training with their specific research and research training practices'.

Calls for change in doctoral education draw on current educational discourses of the knowledge economy, lifelong learning and human capital education, which are influencing national policy makers (Spring 2008, 352). In a challenge to such discourses Servage (2009) questions underlying assumptions, such as those implicit in human capital theory; for example, in relation to doctoral education. In an examination of the growth of and rationale for introducing professional doctorates, she examines claims such as 'that increasing levels of education are required to meet an increasing demand for high levels of knowledge and technical skills: the stated prime drivers of post-industrial economies' (766). She offers alternative theories emphasising conflict and competition in higher education, such as credentialism and the corporatisation of higher education, to explain complex forces driving doctoral reform; and she raises concerns

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about the impact of policies relying on human capital theory on 'students and graduates who may be disappointed to find that human capital theory does not deliver on its promise of status and prosperity for society's most highly educated workers' (765).

These conflicting perspectives and assumptions highlight the complexities involved in debates about doctoral education, its provision and the nature of the doctoral student population. Without an accurate and nuanced understanding of the contemporary student population and the doctoral experience, its diversity and complexity, there is the danger of policies being put in place that do not advance the interests of doctoral students. Pressures for efficiency, for which the usual proxy is timely completions, can reduce doctoral students to objects in a throughput model of inputs and outputs. In this article we argue for recognising doctoral students as diversely different and active agents, with multiple identities and priorities that can change over the course of a candidacy. We also argue for a more critical approach to quantitative data analysis that uses standard demographic and enrolment categories that can mask rather than reveal diversity.

Our argument draws on selected quantitative data on demographic characteristics, enrolment status and life circumstances from a national survey undertaken by the authors in 2005 with the support of the Council of Postgraduate Student Association (CAPA), a national advocacy body for postgraduates, and student association bodies from two universities, as industry partners and co-funders. The survey data show that individual candidates bring varying combinations of goals, expectations, career histories and family and community responsibilities within and beyond the academy. While there is a commonality of the doctoral experience overall, the individual experience is singular and particular, as detailed in many site-specific qualitative case studies, in what can be seen as an open and flexible system of doctoral study and research.

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Revealing the extent of variation

The 2005 survey was conducted online following institutional ethics approval. It included questions about the usual demographic and enrolment characteristics, but also about enrolment histories, activities in a given week and for the duration of the candidacy (e.g. doctoral studies, employment, family responsibilities), and about expectations. This enabled our research to provide more detailed quantitative information about the doctoral population and their experiences than hitherto available, and to explore the utility of commonly used data categories. The online survey was administered with the support of the Deans and Directors of Graduate Studies, as well as CAPA, which hosted the survey on its website, with invitations to participate extended to all candidates enrolled in Australian universities. The data were collected in a de-identified form to preserve anonymity for both institutions and individuals. Students in 38 (out of a possible 39) institutions participated. The data set comprises 5395 cases and in the analyses that follow, this is the number on which calculations are based, unless indicated otherwise (further detail as to the response rate, survey items and analyses undertaken is to be found in Pearson et al. [2008] and Ryland [2007]).

A profile of the survey population (Table 1), using the Meek and Wood/Birnbaum typology, indicates constituential diversity in the doctoral population, similar to earlier studies (La Pidus 1997; Pearson and Ford 1997), but more detailed analysis of the data reveals how such summary presentations can underplay the extent and nature of variation in the characteristics of the doctoral student respondents and their circumstances. This is particularly of interest given that the survey population, while broadly similar to

Table 1. A profile of the respondent candidates' characteristics as at mid-year 2005.

Respondent candidates' characteristics
• 62% women/38% men
• 31 median age/35 mean age
• 70% full-time enrolment at the time of survey
• 79% formal mode of attendance 'internal' (on-campus)
• 92% PhD by research, 4% professional doctorate, 3% doctorate by research and coursework
• 80% Australian citizens
• 70% on scholarships (33% on Australian Government scholarships)
• 5% report a disability
• 1% report being of Aboriginal or Torres Strait Islander descent

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the national population in 2005 where there is matching data, has a potential bias towards a less diverse population. Despite the over-representation of women (national 50%), and of the Broad Field of Study (BFOS) Health (national 12%), the survey population seems closer to the stereotype of a 'typical' student in terms of age and enrolment status. The survey population includes more full-time students (national 62%), and more young students. Forty-four per cent of the survey population were in the younger age grouping of 20–29 years (national 36%), and 45% first enrolled in 2004 and 2005: that is, in the first 18 months of their candidacy.

The more detailed analysis of mean ages across BFOS in Table 2, for example, confirms how the profile underplays the extent of variability. While the mean age (35) of the survey respondents (female/male 34.64/34.89) supports the more contemporary view that candidates are more likely to be in their thirties than their twenties, this

Table 2. Age of respondents across BFOS: means and range.

BFOS/means	% of total	Mean	Standard deviation	Minimum boundary	Maximum boundary
Agriculture, Environment and Related Studies	6	32.89	9.196	21	70
Architecture and Building	1	38.26	9.407	24	68
Creative Arts	4	40.03	11.931	21	75
Education	8	45.15	10.134	21	81
Engineering and Related Technologies	6	28.95	6.970	21	60
Health	20	34.47	10.343	21	76
Information Technology	5	34.09	10.466	21	80
Management and Commerce	6	38.31	10.429	22	78
Natural and Physical Science	20	28.63	7.809	16	74
Society and Culture	24	37.26	11.545	21	70
Total	100	34.75	11.011	16	81

does not reveal the full extent of the actual variation. There are different means across BFOS, with Education (mean age 45) as an outlier, as are Engineering and Related Technologies and the Natural and Physical Sciences (both with means of 29); findings similar to those in analyses of national data in Pearson and Ford (1997, 127–31). The survey students span a wide age range from 16 years to 81 years, with varying age distributions within BFOS. Table 2 shows a wide age range as a feature of all the BFOS: that is, within-group differences are as evident as those among groups. An additional analysis of the 29 respondents over 65 years of age includes representation from all BFOS bar Engineering. The oldest, at 81 years of age, is in BFOS Education, with the next oldest in the BFOS Information Technology. Investigation of these 29 cases identified 9 with scholarships, 10 of whom were full-time. The earliest first year of enrolment was 1997, whereas 7 first enrolled in the year of the survey, in 2005. These patterns of age distribution are especially significant, given the greater percentage of younger students in the survey population, in contrast to national data.

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The utility of commonly used categories for capturing doctoral student diversity

Further detailed analyses of the survey responses summarised in Table 1 raise the matter of the utility of categories related to enrolment status such as 'full-time' and 'part-time', and 'international' as opposed to 'domestic' students, in understanding the nature of the doctoral experience and of the candidate population.

The Australian government collects data on enrolment status biannually for all higher education students, as to type of attendance (full-time/part-time) and mode of attendance (internal/external/multimodal), both of which categories relate to resourcing policies. The difficulties of generalising about doctoral students categorised by mode (internal/external/multimodal) and type (full-time, part-time) of attendance, especially as they were once conflated into one category, have been raised in a previous study (Pearson and Ford 1997). Since 2000 these two aspects of attendance have been collected as separate categories by the relevant government department.

Enrolment status: type of attendance

Calculating the proportion of full-time to part-time candidates in the doctoral population is complicated by the lack of data on the extent of movement between attendance types. In the survey, respondents were asked to give their enrolment history from the year they commenced. The tracking of changes in enrolment status shows that 20% of the respondent population had changed their status at least once during their candidature to date. Table 3 shows that of the remaining respondents, 64% were always enrolled as full-time and 16% had been permanently enrolled part-time.

Table 3. Summary of enrolment history throughout candidature ($n = 5391$).

Status	% respondents
Always part-time	16
Changed status	20
Always full-time	64

This finding establishes that enrolment status can be fluid, and it supports evidence that doctoral students may choose their enrolment status strategically to optimise their time to complete and/or manage other priorities (Neumann 2003). The percentage of those changing status is probably an underestimate, given the population, of whom many are earlier in their candidature, because full-time candidates are more likely to change to part-time candidature when their scholarship runs out. There is some evidence of this effect in the survey population, where of the 20% who had changed their status, 48% (53% of whom were full-time at commencement) had done so by their fourth year of candidature (Ryland 2007, 93).

At issue too is the operational meaning of these categories. The underlying assumption in Australia is that part-time students spend half the time a full-time student spends on their studies; therefore government funding allocates for part-time students half the amount identified for full-time doctoral students. However, the data suggest the matter is more complicated than this. In a comparison of the time spent in a given week (8 blocks of time ranging from 'did not undertake' to 'over 60 hours') by the part-time and full-time respondents enrolled in 2005, Ryland (2007) shows that there is considerable variation within both groups. Ryland calculates the mean time for full-time respondents as 33.2 hours, and for part-time respondents as 14.1 hours, but with standard deviations of 17.4 and 14.2 respectively. Thus, some full-time students spent little or no time on their doctoral studies, and some part-timers had spent over 40 or 60 hours in the previous week. Of course, it is to be expected that there might be good reasons for some of this variation, as students go on holiday, get sick or have other work commitments in a given week. It is helpful, then, to turn to an analysis by Hopwood et al. (2009), drawing on a micro-level longitudinal study of four full-time students in the social sciences who kept weekly logs of time spent directly related to their doctorate, and the activities undertaken during this time. Analysis of the logs shows considerable variation in study patterns among the four students and in hours logged from week to week, but the amount of time spent did not relate to their satisfaction with their progress. Both studies confirm an earlier conclusion by Neumann (2003, 18–19) that the distinction between part-time and full-time enrolment, with its attendant assumption of distinctive work patterns, is of questionable utility.

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Enrolment status: mode of attendance

To explore where the respondents actually carried out their research and study, respondents were asked which doctoral activities they had pursued in the previous seven days, and then to indicate where they had undertaken the majority of these activities during that time. Table 4 shows the range of locations for doctoral activities, with the university and the home being the most popular. This table shows that the majority of respondents were not physically 'on campus' for the majority of their doctoral activities in the survey week. The pattern of locations varies across and within BFOS, but in all cases, at least 30% (ranging from 78% BFOS Education, to 31% BFOS Engineering and Related Technologies) reported undertaking doctoral activity off campus in the previous week.

Further detail on the location of candidate research activity comes from responses to a question about the location of resources (such as information technology, experimental equipment, materials and information resources) used for doctoral research and frequency of use during the candidature to date in the following locations: university, home, employer, external research agency or industry partner (Pearson et al. 2008). The responses given suggest that this range of locations for research is usual, but is

Table 4. Location where undertaking the majority of doctoral activities in past seven days.

Location	% respondents
On-campus	42
Home	33
Research Centre	8
Workplace	5
Field	3
Other	4
No response	5
Total	100

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likely to vary over time according to the nature of the activity. The use of such a range of locations for infrastructure holds for all BFOS, with 'university' and 'at home' the most frequent locations. The patterns within each BFOS also vary with, for example, those candidates in BFOS Health more likely than other BFOS to carry out their research in a research agency, while BFOS Education, Management and Commerce are more likely to use employer infrastructure support, though the numbers remain small.

Overall, these findings call into question the utility of the distinction between the modes of attendance. This conclusion is given added weight by consideration of the official government definitions as follows:

> Internal Mode of Attendance [is for a] unit of study for which the student is enrolled and is undertaken through attendance at the Higher Education Provider on a regular basis; *or where the student is undertaking a higher degree unit of study for which regular attendance is not required, but attends the higher education provider on an agreed schedule for the purposes of supervision and/or instruction;* [whereas an] External Mode of Attendance [is for] a unit of study for which the student is enrolled, and involves special arrangements whereby lesson materials, assignments, etc. are delivered to the student, and any associated attendance at the institution is of an incidental, irregular, special or voluntary nature. (Department of Education, Employment and Workplace Relations 2010, emphasis added)

At the doctoral level, this distinction is a fine one. What is important is not attendance itself but rather the extent and nature of the connection to the enrolling institution, and the consequential demands on resources, neither of which is closely connected to the current definition for modes of attendance for doctoral study and research. Nor do data collected using the category 'mode of attendance' give useful information about the doctoral experience to inform policy at the institutional level.

Enrolment status: 'international' and 'domestic' students

Another familiar distinction at both the undergraduate and graduate level in education in Australia, as elsewhere, is between domestic and international students. The 'domestic' category includes New Zealand citizens in addition to Australian citizens and permanent residents of Australia (of any nationality), leaving everyone else to be classified as 'international'. 'International' is a heterogeneous category with some fluidity,

because some 'international' students obtain permanent residency during their candidature and, thus, in government terms, become 'domestic'. Applying the official criteria to the 2005 survey population, a total of 679 (13%) meet the definition of 'international'. This group is from diverse cultural, ethno-linguistic and national backgrounds. They come from 100 countries and territories beyond Australia and New Zealand, and from all continents. The highest numbers of respondents come from: the USA (59); Indonesia (48); China and Malaysia (45 each); India (44); Thailand (41) and Germany (36). Thirty-five respondents were the sole representatives of their nations.

These international students as a group are both similar and varied in comparison with 'domestic' student respondents in respect of their characteristics and their doctoral experiences. As would be expected given visa regulations, most (92%) are in full-time attendance and most (81%) hold scholarships of some kind. More are male (53%), and more are already academics (40% as opposed to 29% 'domestic'), but the mean age (32.42 years) is slightly lower than the average of the survey population. The distribution across BFOS is similar to that of the 2005 national and survey populations, with the larger numbers (143 and 125) in BFOS Natural and Physical Sciences and Society and Culture respectively, but proportionally more are within the BFOS Engineering and Related Technologies and Management and Commerce, and proportionally fewer in BFOS Health than for 'domestic' students.

Despite their within-group national diversity and variation in respect of characteristics such as age and gender, compared with those respondents defined as 'domestic' in terms of their expectations of the doctoral program being met, the level of satisfaction of the international and domestic students is similar (Pearson et al. 2008). These findings suggest caution in treating 'international' students as a homogeneous group on any grounds other than those dictated by official regulations for visa holders regarding length of stay, entitlements to medical care and transport concessions, among others.

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The diversity of life circumstances, expectations and goals

Responses concerning the life circumstances of candidates, their expectations and goals, reveal further variation among the respondent population, and their connections to the broader environment within and outside the institution. The range of the activities undertaken, through participation in doctoral study and research, non-academic employment, paid and unpaid academic employment, leisure, family and domestic responsibilities, and voluntary and community activity (Table 5) presents a picture of people living a full life. Most respondents (95%) worked on their doctorate during

Table 5. Participation in and time spent on doctoral and non-doctoral activities in survey week.

Activities/hours	<20	21–40	41 +	% undertaking activity
Doctoral	34	36	24	95
Paid non-academic employment	21	9	5	35
Paid academic work	23	5	2	29
Unpaid academic employment	18	1	0	18
Family and/or domestic activities	75	12	7	94
Leisure	86	5	2	93
Voluntary	31	0	0	31

the survey week, though for varying amounts of time. The majority also carried out family or domestic activity, and made time for leisure.

Employment paid and unpaid

Employment activity was varied in terms of hours spent in a week. Paid non-academic employment was undertaken by 35% of the respondents, but mostly for 20 hours or less (21%). However, many respondents engaged in both paid (29%) and unpaid (18%) academic work, specified as tutoring, demonstrating, marking, lecturing and research assistance. In the former case the majority of respondents did so for 20 hours or less (23%), but of the respondents undertaking unpaid academic activity, 75% undertook five hours or less, and less than 1% did more than 20 hours.

Additional data as to the amount of academic work undertaken during the course of a candidacy show how frequent this involvement is. Most respondents (78%) have undertaken at least some academic work, and for 71% of the respondents it is paid. The paid activity undertaken by most respondents is tutoring/demonstrating (58%), both by those with and those without scholarships. These findings reflect in part the involvement of those respondents (30%) who give being an academic member of staff (full-time, part-time or on study leave) as their main occupation; but this does not negate the finding that participation in academic work of some kind during a candidacy is a common activity in the Australian system, even though there is little in the way of formal programs for teaching assistants, as is found in the American system.

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Domestic responsibilities

Ninety-four per cent of the respondents report spending time on domestic responsibilities, with the majority spending up to 20 hours in their survey week. There are some variations according to enrolment status and gender. Full-time enrolees (2005 status) report less time than part-time enrolees on domestic activities, but among those enrolled full-time the time reported for domestic responsibilities is similar for both men and women, in contrast to part-time enrolees, where women report more time spent thus than men. Ryland (2007), however, advises caution in assuming women spend less time on their doctorate, as other factors such as time spent on employment, affect the allocation of time.

The findings on domestic responsibilities also relate to the number who are partnered and have children, with 58% living with a spouse or partner and/or with dependent children (27%), with family circumstances little different for those with 'international' status. In all, there is no clear relationship between mean ages, BFOS or family circumstances. Analysis shows that the number of children within BFOS is similar for men and women, but age is the variable most strongly associated with the number of children.

Leisure and community/voluntary activity

The great majority of respondents (96%) give leisure as an activity, but mostly for 20 hours or less. Additionally, almost a third of the respondents (31%) participating in community/voluntary activity indicate a similar amount of time allocated to this activity. Examples of this latter activity, as itemised in the survey, include charity, cultural, religious, political or environmental activities. This finding confirms the existence

of extra-curricular activity undertaken by many doctoral students, which is often overlooked when discussing doctoral study, presenting an overly narrow focus on the formal academic pursuit of the doctorate (Cumming 2007, 35)

Goals and expectations

One indication of motivation and goals is the way in which respondents view their candidature. Overall, and within all BFOS, there is limited agreement on the nature of the candidature, with 'professional development' given by only 44% of the total population, as shown in Table 6. There is considerable variation as well, with those in BFOS Health ranking this most highly (56%) and with Society and Culture least highly (32%). This variation exists within all BFOS as well as across them. Only in the BFOS Health and Management and Commerce is there agreement of over 50%, and even then the figure remains in the fifties. While the range of responses raises the issue of terminology, as these terms have varying meanings for doctoral candidates, their supervisors and others, the varying use of terminology also reflects presumably different perspectives among those involved in PhD programs as to their purposes and educational nature.

This variation is not so surprising if we take into account the respondents' personal and professional circumstances and the range of disciplines clustered under some BFOS, such as Health, where there is a mix of laboratory and clinical disciplines involved. Other factors are also important. As with other academic work, doctoral

Table 6. Views on candidature across BFOS.

BFOS/Views %	Education	Knowledge production	Personal development	Professional development	Training
Agriculture, Environment and Related Studies	17	11	11	49	7
Architecture and Building	5	30	8	49	0
Creative Arts	12	21	18	42	1
Education	22	20	15	36	2
Engineering and Related Technologies	16	14	13	49	4
Health	12	10	10	56	9
Information Technology	13	17	19	43	6
Management and Commerce	16	11	17	52	2
Natural and Physical Science	22	11	9	45	9
Society and Culture	20	25	16	32	3
Total*	17	16	13	44	6

*Asked to choose one option from a menu, less than 1% gave 'leisure', 1% gave 'other'; 2% did not respond.

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work is mediated by institutional contexts and by the research and doctoral education environment. This mediation is becoming more complex as research migrates from teaching and research departments into research centres, and more interdisciplinary research is undertaken (Austin, Kiley, and Pearson 2009; Pearson 1999). Moreover, as with individual academics (Välimaa 1998), they are likely to be influenced by a range of connections within and outside the academy that are additional to the culture of their disciplinary community.

The variation in perspectives can also be linked to differing goals for post-graduation employment. Only 39% of respondents give university work as their preferred destination, and the next largest group (23%) give 'not sure'. A further 15% nominate the public sector, 14% the private sector and 5% the non-profit/community sector. Of interest is that of those giving 'university' as their employment destination, 47% are those claiming to be an academic member of staff in 2005. However, a sizeable number of this latter group of academics (39%) do not plan to continue in academia after they graduate. Some are looking to other fields in the private and public sector and, like many others who are not academics, are uncertain about their future plans.

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Discussion and conclusions

These analyses of the survey data challenge assumptions informing policy formulation as to the 'typical' candidate, and the existence of discrete and stable subgroups such as 'part-timers' or 'internationals' with common expectations and needs. The survey data show that within-group differences are as important as among-group differences, even within BFOS. Candidates bring varying goals, expectations, career histories and family and community responsibilities to their candidature. These reach beyond the academy, and shape how they engage with their doctoral candidacy. The result is the complex and particular individual experiences recorded in many qualitative studies.

The findings question the utility of commonly used categories used for official data collection and, subsequently, for research and policy purposes. Ross (2001) argues that models and categories in use for higher education policy and management purposes were initially established for undergraduate purposes, and are not necessarily appropriate for doctoral education. This is borne out by the findings from the survey. Full-time and part-time status can be fluid as candidates adjust to changing circumstances over the duration of the candidature, and individual work and study patterns will vary among both full-time and part-time enrolees. Those enrolled as 'internals', which in Australia is often taken to mean being on campus, despite the official definition as quoted earlier, can be in various sites off campus (even overseas) undertaking their study and research. This reflects, as argued by Pearson and Ford (1997), an open and flexible system of doctoral study. This open and flexible system is not to be seen as a version of distance doctoral research and study separate from the norm of so-called 'traditional' doctoral education, but a more accurate description of the existing system of doctoral education in its entirety. Assumptions as to the relationship between enrolled status and attendance, and the cost, efficiency and productivity of doctoral students require critique. Doctoral research, as with any research, is a creative process that will not flourish within rigid regulation and constraints of time and place. Conditions for research and study need to be as flexible and responsive to individual student needs and circumstances as possible, and outcomes need to be understood and appreciated as unfolding over the life of the graduate and not just 'on completion'.

Most institutional data collection practices have been established to satisfy government reporting requirements related to matters of funding, equity of access, and efficiency across the system. These do not produce sufficient, nor necessarily appropriate, data, to assist in monitoring internal institutional quality, or to inform educational decision-making on issues in curriculum, pedagogy and supervision, nor to assist other stakeholders, such as postgraduate associations, in assessing their members' needs nationally and locally. The problem does not rest principally with government data collection for such purposes, but rather with uncritical use of these data for other purposes. Marsh, Rowe, and Martin (2002), in a paper on PhD students' evaluation of research supervision, argue the importance of a multilevel perspective in higher education research. They state that:

> Almost all data for higher education are inherently multi-level … research, policy questions, data, and statistical analyses that are appropriate at one level of analysis may be inappropriate or even misleading when evaluated at another level of analysis. (315)

Similarly the use of government categories developed for undergraduate courses, such as modes/types of attendance, in doctoral reporting is problematic, as is conceptualising (sub)groupings based on these categories as stable with common characteristics. This invests meaning in these groupings that is at best misleading, and masks the very diversity that is of significance.

An alternative perspective to focusing on such (sub)groupings of doctoral students is to capture the diversity in the doctoral experience by assuming that all doctoral students have both common and particular characteristics that will affect their experience, and to recognise that these characteristics may change during the candidature. Doctoral students may be viewed as 'diversely different', as they use their own experience, knowledge and abilities to negotiate their particular doctoral path in their research and institutional context, and in their wider personal and social contexts. 'Diversely different' acknowledges difference without attributing specific group affiliation, recognising that people have multiple identities that may change over time (Sen 2006). Thus, a doctoral student might be a medical science researcher, a casual tutor, a mother of primary school children, a keen environmentalist and a committed supporter of a community choir for the disadvantaged. Another might be a mid-career academic researching industrial relations in a global context, living in university accommodation on a scholarship, travelling often for research purposes as a research assistant in a funded project, and with responsibilities for parent care in his home country.

Doing research, developing original ideas and relating to peers and supervisors within the institutional framework of a doctoral program provide the structure of what is common to the experience of being a doctoral student. But the path is different for each individual student, given their idiosyncratic life circumstances, career histories and goals. Bringing together the structures and the individual paths is the open and flexible system of doctoral education that can encompass Enders' (2004) 'small worlds of research training' and the particular experiences of the diversely different doctoral students. These doctoral students are active players in the production of research as well as being 'in training'. In earlier analyses, Siddle (1997) in Australia and Enders (2002) in Germany, estimate that doctoral students carry out some two-thirds of research activity. They should be recognised as key stakeholders in the process of doctoral education and research production, not as inputs to an educational pipeline. They too, like institutions and governments, make a major investment in undertaking doctoral study and research,

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building their intellectual capital and developing higher order skills for their current and future careers, and for society and the community more broadly.

It is of note that at a recent major conference on the reform of doctoral education in the European Union, the 'successful individual research experience of the doctoral student' was agreed as central to reform attempts to develop the talents needed for a research and innovation system that will form the 'backbone' of the future European economy and society (Wintermantel 2008, 1–2). Completing doctoral candidacy is essential, but not sufficient. What also matters are other criteria, such as a good-quality thesis, productive research and scholarly experience with outcomes that open up further research potential, an empowering experience leaving a capable researcher and scholar ready and motivated for an academic or research career, or for creative work in industry, professional or community settings. For such outcomes, government and institutional policies and procedures must provide flexible conditions to allow independence and creativity to flourish.

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Acknowledgements

This article draws on research conducted for an Australian Research Council Linkage Project 2004–2006, entitled 'Working students: reconceptualising the doctoral experience'.

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