DOCTORAL EDUCATION IN SOUTH AFRICA: MODELS, PEDAGOGIES AND STUDENT EXPERIENCES

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DECLARATION

I hereby declare that the work contained in this thesis is my own unaided work. It has not been submitted for degree purposes to any other university.

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Date: _____ of _____ 2009

ABSTRACT

People who hold doctoral degrees are considered valuable national resources able to produce knowledge to address pressing problems, and important sources of labour for the higher education sector. However, in 2006, only 1100 people graduated with doctoral degrees in South Africa. This limits the potential for research and improvements in higher education. In addition, 618 of those graduates were white, making it difficult to address equity concerns. Within the higher education sector there are debates about how to increase enrolments in doctoral education and the best way to run PhD programmes for effective learning, high quality research results and for efficiency.

But there is little South African-based empirical research into what makes people undertake PhDs, how the programmes work and what learning and knowledge result. This study explores how different stakeholders – national and institutional policymakers, academic staff and doctoral people – understand the PhD; how these understandings influence the practice of doctoral education; and how different practices affect the PhD experience and the learning and knowledge produced. The primary research question I address is: **"How do existing models and pedagogies of doctoral programmes shape the learning of doctoral people and the outcomes of doctoral programmes in South Africa?"**

The origins of the Doctor of Philosophy degree are often traced back to the nineteenth century reforms of German universities when the idea emerged that all scholars should be actively involved in research. But this is a simplistic view. By examining the evolution of the PhD in greater depth, it becomes clear that it has undergone continuous change and has always served both the high-minded pursuit of knowledge and the more prosaic pursuit of skills for employment. The literature reflects ongoing tension between the scholarly view of the PhD as knowledge generation by an emerging scholar, and the labour market view of the PhD as developing high-level research skills. In the South African context both of these views can be observed, but I also identified a view of the PhD as ongoing personal development through an engagement with knowledge.

The three views of the PhD are underpinned by different discourses which inform the practice of doctoral education. In South Africa, the traditional model of individual supervision dominates, and it varies by discipline, department and supervisor. But patterns

of practice can be discerned and I identify four of these and discuss how supervisors construct their individual supervision practice.

Doctoral education is also a function of the people who do PhDs. Much of the research undertaken in the overdeveloped world focuses on younger people who are starting out on academic careers. However, in South Africa, many people doing PhDs are older and midway through careers which are often not academic. This leads me to propose a model of intersecting contexts, as an alternative to McAlpine and Norton's nested context model of doctoral education, which more accurately reflects the local situation. I discuss the PhD experience and make use of the intersecting contexts model to develop the notion of *congruence* between the PhD, the contexts and the PhD person with more positive experiences being related to higher degrees of congruence. Finally, I consider how the outcomes of doctoral education, the learning and knowledge which result, relate to the expectations of the different stakeholders.

The research took the form of a qualitative study with a multiple case-study design employing theoretical replication. I examined doctoral education in four academic units at three South African universities with the units selected to represent different disciplines. All four units were in previously advantaged universities from the English-speaking tradition and all were successfully producing PhD graduates.

These rich pictures of how doctoral education takes place contribute empirical evidence to current debates about the PhD in South Africa. At a conceptual level I identify the competing discourses about what a PhD is. I provide a more nuanced understanding of the practice of doctoral education within the overarching model of individual supervision. The intersecting contexts model provides a way to understand the expectations and circumstances of doctoral people and the notion of congruence illuminates their varied experiences. Finally, the study confirms that the outcomes of doctoral education, in terms of learning and knowledge generated, meet at least some of the expectations of policy-makers, supervisors and people who do PhDs.

Keywords: doctoral education; postgraduate education; doctoral supervision; PhD programmes; knowledge; complex adaptive system; agency

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Administrative staff are the unsung heroes of higher education who contribute organisational and social skills so often lacking in their academic counterparts. Hanging about in unfamiliar departments gave me ample time to observe and be impressed by how these incredible women (and they were all women) deal with students, academic staff and other organisational matters. I would particularly like to thank (in chronological order)

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ABBREVIATIONS AND ACRONYMS

CAQDAS	Computer-assisted qualitative data analysis software
CBD	Convention on Biological Diversity
CE	Christian Era
CEE	Civil and Environmental Engineering
CHE	Council on Higher Education
CSIR	Council for Scientific and Industrial Research
DoE	Department of Education
DST	Department of Science and Technology
EBE	Engineering and the Built Environment
FRD	Foundation for Research and Development
GEF	Global Environment Facility
HAU	Historically advantaged university
HDU	Historically disadvantaged university
HEMIS	Higher Education Management Information System
HEQC	Higher Education Quality Committee
HEQF	Higher Education Qualifications Framework
IT	Information technology
ICT	Information and communications technology
MAM	Mathematics and Applied Mathematics
NCHE	National Commission on Higher Education
NGO	Non-governmental organisation
NQF	National Qualifications Framework
NRF	National Research Foundation
NSFAS	National Student Financial Aid System
P&DM	Public and Development Management
RQS	Resource Quality Services (of the Department of Water Affairs and Forestry)
SADC	Southern African Development Community
SAPSE	South African Post-School Education
SAQA	South African Qualifications Authority
UCT	University of Cape Town
UNISA	University of South Africa
UKZN	University of Kwa-Zulu Natal
Wits	University of the Witwatersrand

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Chapter One

INTRODUCTION

An overview of this study, its purpose and framing

1.1 Introduction

"SA desperate for new PhDs" (Nombembe 2007), "The route to the knowledge economy" (Malada & Netswera 2007), "Where are all the black postgraduate students?" (Ngobeni 2006), "More researchers on the cards: plan to increase grants" (Pretorius 2007) – recent newspaper headlines in the Sunday Times and Mail & Guardian reflect some of the current issues surrounding doctoral education in South Africa. Doctoral graduates are believed to be critical for the success of the country in the knowledge economy, there is a need for more of them, and too few of them are black.

In raising these issues, the press reflects a keen interest in doctoral education at the level of policy. The Department of Science and Technology (DST) bemoan the fact that few undergraduates move into postgraduate research and is seeking ways to keep science graduates in the research system (DST 2006:12). In an address to a conference on "Human Resources for Knowledge Management in South Africa" in Cape Town in 2005, the Minister of Education listed six critical issues for improving research in South Africa. The first of these was: "We need more researchers with PhDs" (Pandor 2005). Indeed, only 16% of academic staff at South African universities have PhDs.[1] These concerns are being acted on. The National Research Foundation (NRF) launched the South African PhD Project in November 2007 with the aim of increasing the number of PhD graduates in South Africa (NRF 2007).

The preoccupation with increasing the number of PhD graduates filters down to the universities, where strategies are devised around "broadening the research base" (Wits 2002b:3) and to "develop research capacity" (UKZN 2007b:10). With encouragement from national and institutional level, there has been a surge in academic research around doctoral education. In February of 2007 the NRF hosted a "Post Graduate Research Indaba" in Pretoria and in April 2007 a conference at Stellenbosch University titled "Postgraduate Supervision: the state of the art and the artists," resulted in the publication of a special

[1] According to the Higher Education Management Information System (HEMIS), 2007

edition of the *South African Journal of Higher Education* (2007:21(8)). This increase in research into doctoral education is not unique to South Africa, but reflects a growing body of research across the globe that considers questions of doctoral education and how it should proceed.

However, those more closely involved in the academy do not always share the concerns of policy makers. Academic researchers disagree on whether there is a need for more PhDs (Hirsh 1982:195-197). And while academic development practitioners and some supervisors have embraced the idea of improving doctoral education (Charlesworth et al. 2007), others feel that doctoral education works, and internal training and seminars on postgraduate supervision are poorly attended.[1] In addition, prospective doctoral people do not line up to enroll in response to calls for more PhDs. What does the PhD mean to the academic profession and to the people who actually do PhDs? What about the PhD do they value, and how does this inform their views on the PhD and the practices surrounding doctoral education? Without a clear understanding of these individuals, the work they do, what they value and what motivates them, it is difficult to understand how they will act in response to policy and thus difficult to construct effective interventions.

This then is an exploration of doctoral degrees – what they are, the people who complete them, the people who guide this process, and the academic and disciplinary traditions that shape the work of producing doctoral graduates. The primary research question to be addressed in this study is: **How do existing models and pedagogies of doctoral education shape the learning experience and the outcomes of doctoral programmes in South Africa?**

This introductory chapter raises the research problem, positions the study within the field, and outlines the structure of the thesis. I begin in section 1.2 with a rationale for undertaking research into doctoral education in South Africa. Next, in section 1.3, I review the growing body of research into doctoral education and position this study within it. Then in section 1.4, I set out the key research questions and explain the considerations that led to these questions. Finally, I explain in section 1.5 how the thesis is structured and the focus of each of the subsequent chapters.

[1] WGO01; WGO02; WGO04

1.2 Why study doctoral education in South Africa?

Traditionally the doctoral degree has been pursued as a step in the process of becoming a member of the academic community (Becher 1989:108). It involves completing a substantial piece of research work, in the traditions of one's chosen discipline, and under the guidance of an established scholar. In the process one becomes part of a community of scholars, lays the foundation for future academic research and establishes a network with which to communicate and collaborate. Doctoral studies in South Africa reflect this tradition and have remained relatively stable over time. They are widely viewed as research degrees and are examined by a dissertation which is regarded as "an expression of scholarship and research of the highest standard" (Mouton 2001:xi).

In the past three decades this tradition has been challenged by significant debates taking place globally around the purpose, structure, pedagogies and intended outcomes of doctoral studies (Bleiklie & Hostaker 2004; Blume 1995; Bologna 2005; Golde & Dore 2001; Golde & Walker 2006; Nerad 2004; Noble 1994; Reichert & Tauch 2005; Sadlak 2004; Walker et al.). On the one hand, changes to the doctoral degree are being driven by external considerations – increasing numbers of people seeking access, changes in graduate's career paths, the need for regional and global mobility of graduates, and a demand for PhDs in professional and creative disciplines (Bologna 2005; Bourner et al. 2001; Eurydice 2005; Fink 2006; Golde & Dore 2001; Reichert 2005; Rinne & Sivenius 2007). On the other hand change is also driven by internal changes in the higher education system – the growth of accreditation policies and practices, the blurring of traditional boundaries between disciplines, changes in the nature of academic work and changes in the nature of research making new demands on the training of researchers (Gibbons et al. 1994; Golde & Dore 2001:6; Johnson 2006; Leonard 2001:10; Moja & Cloete 2001; Pretorius 2001:78; Strathern 2000).

Although South Africa does not have the glut of doctoral graduates that are a concern in the USA (Golde & Dore 2001; Heathcott 2005), many of the global pressures on doctoral education are felt here. In addition, South Africa faces pressures unique to the historical context of the country. At a national level, policy documents reflect two key concerns for higher education in South Africa (DoE 1997; CHE 2000). Firstly, there is a need to lessen historical inequities by ensuring a better distribution of skills and opportunities across all sectors of the population. Secondly, there is a need to leverage the investment in higher education to promote economic prosperity and social stability. Doctoral programmes

contribute to these national goals by providing skilled staff for the academic institutions, by developing high-level research skills and by creating a group of critical intellectuals who are expected to contribute to creating a stable society.

However, South Africa graduates relatively few doctoral students (Mouton 2007:1088) and consequently, there are debates within higher education in South Africa about the best ways to fund and run doctoral education for effective learning, high quality research results and for efficiency (CHE 2004b:90; Dietz et al. 2006; Lessing & Schulze 2002; Peckham 1995; Van der Westhuizen & De Wett 2002). In a review of South African higher education, the Council on Higher Education (CHE) has suggested that "approaches are needed to increase postgraduate enrolments and outputs, on the one hand to build higher education research capacity and on the other bring new blood into the ageing academy" (CHE 2004b:90). The higher education workforce in South Africa continues to be dominated by white middle- or late middle-age men (CHE 2004b:91) and of the 1100 people who completed PhDs in 2006, 618 were white[1] which clearly limits the potential for developing a more representative academic staff in South African universities.

Historically South Africa is at an interesting juncture in higher education. Significant changes have been made to the structure and regulation of the sector and universities are grappling with "transforming" themselves. The notion of *transformation* is widely debated (CHE 2000; CHET 2002; Cross 1998; DoE 1997; Ntshoe 2004; van Wyk 2003), but can be interpreted to mean:

> *…a process of negotiated organisational change that breaks decisively with past discriminatory practices in order to create an environment where the full potential of everyone is realised and where diversity – both social and intellectual – is respected and valued and where it is central to the achievement of the institution's goals. (Wits 2005:8)*

Transformation of the universities encompasses changes to teaching and research, institutional governance, organisational culture and demographics.

The PhD has been likened to an academic apprenticeship (Delamont et al. 2000; Huisman & Bartelse 2001; Önnerfors 2007; Sadlak 2004:82), which calls to mind Lave and Wenger's characterization of apprentices as legitimate peripheral participants in a community of

[1] Higher Education Management Information System (HEMIS) 2006, http://www.education.gov.za/dir_docs/Update/2006/2006.asp

practice (Lave & Wenger 1991). In their model, these newcomers play an important role in the continuity as well as the ongoing renewal of both the community and the practice (Lave & Wenger 1991:114). Doctoral programmes provide academic disciplines with a means of reproducing themselves by providing newcomers that expand the knowledge base and develop the debates and discourses. Doctoral graduates also bring different perspectives and suggest changes to practice while having absorbed the culture of academia and having sufficient legitimacy to challenge academic practice (Wenger 1998:91). Doctoral programmes can thus play a key role in the transformation of higher education.

Internationally there has been a shift in doctoral programmes "from a learning-by-doing model, where the individual relation with the supervisor was essential, towards a formal training programme attended by all PhD students" (Huisman & Bartelse 2001:69). In South Africa doctoral programmes have not reflected this shift and continue to be based on the model where individuals complete a significant research project under the guidance of a supervisor to produce a thesis (Dietz et al. 2006; Mouton 2001; Wits 2006b). While there have been some programmes that approach doctoral training differently (Dietz et al. 2006; Samuel 2000; Szanton & Manyika 2002), and claims that such changes are beneficial for developing researchers in historically disadvantaged universities[1] (Samuel 2000:63), there appears to be resistance to change in this area, and concerns about compromising standards of academic excellence (Samuel 2000:64).

Resistance by academics to changes in doctoral programmes is less surprising when one considers that research into doctoral education has often been driven by the concerns of national planners to reduce the cost, increase graduation rates and produce skills in line with national needs (Harris 1996; Huisman & Bartelse 2001; Sadlak 2004:7; Winfield 1987). There has (until recently) been little attention paid to understanding what the doctorate means to the academic disciplines.[2] As a formative experience in the life of academics, it is appropriate that this "rite of passage to the scholarly life" (Becher 1989:108) be defended by scholars wanting to preserve the culture of their disciplines. Changes to doctoral programmes will have to take into account the cultural role of the PhD.

[1] In South Africa, historically disadvantaged universities are those that were reserved for people not classified as white during the apartheid years.

[2] More recently there has been a move towards this sort of inquiry with, for example, the publication of a collection of essays on doctoral education by scholars and researchers (Golde 2006)

A further concern is that Africa's colonial past leaves Africans ambivalent about emulating European traditions in the form and structure of the PhD. Wanting to be able to define a locally appropriate doctorate is in conflict with the desire to compete globally. Szanton and Manyika raise the question as to what an African PhD might be like, pointing out that:

> *The requirements and expectations that go with the PhD already vary in the US, Europe, Japan, and elsewhere. Bringing in African experience and understandings of the sites and sources of knowledge, might suggest still additional models, procedures, and expectations derived, perhaps, from some now unimagined combination of the new technologies and African intellectual and expressive forms. (Szanton & Manyika 2002:46)*

Doctoral education is a focus at policy level in South Africa at present. It has the potential to contribute not only to economic prosperity and social stability, but also to the transformation of universities. But there is a need to fully appreciate the role that the PhD plays in the academic disciplines. At a national level, the National Research and Development Strategy identifies a need for more research into higher education "by the social sciences to delineate the problems that we face, and provide specific proposals for interventions that would strengthen our ability to respond" (DST 2002:36). And at an institutional level the need has been identified to improve post-graduate programmes "for post-graduates are our academics, researchers and scholars of the future" (Wits 2005:2). This study will contribute to these needs by providing an understanding of the goals and purposes of doctoral programmes and how these relate to the practice of doctoral education.

1.3 Positioning this study in the research into doctoral education

Research into doctoral education is published in monographs and in journals devoted to higher education research in many countries, but most prolifically in Britain and the USA. At least one journal devoted to doctoral education has emerged, the International Journal of Doctoral Studies which began publishing in the USA in 2006. Local research into doctoral education is published in the South African Journal of Higher Education as well as international and other local journals. In addition, much research into doctoral education is commissioned by regional or state bodies (Bakradze et al. 2005), higher education institutions (Lubbe 2004) or funders like the Carnegie Corporation (Cloete & Galant 2005), UNESCO (Sadlak 2004), and the Rockefeller Foundation (Szanton & Manyika 2002). Doctoral education is also the subject of many self-help books written for people

undertaking doctoral studies (Badenhorst 2008; Leonard 2001; Mouton 2001; Rugg & Petre 2004) or for supervisors (Dietz et al. 2006; Kamler & Thompson 2006). While some of these books are of interest only for what they reflect about the practice and experience of doctoral study, others are research-based or well supported by references to appropriate research (Badenhorst 2008; Dietz et al. 2006; Kamler & Thompson 2006; Leonard 2001).

Research into doctoral education began during the 1970's in response to concerns about costs and funding, the low throughput rates, and the long times to completion of doctorates (Bair & Haworth 1999; Winfield 1987); but in these past few decades has grown to a substantial body of work. The now extensive literature on doctoral education focuses on three types of questions (which are not mutually exclusive).

Table 1.1: Themes in research on doctoral education

Administrative and planning concerns
National labour needs
Attrition and submission times
How doctoral education does or should take place
Pedagogies in doctoral education
Models of doctoral education
The impact of research cultures
The experiences of doctoral 'students'
Meta-questions about the purpose and goals
Purposes, goals and expectations
The intended learning in doctoral education

Firstly there is research that addresses administrative and policy concerns. These include identifying national labour needs and debates about how to meet them (Huisman & Bartelse 2001; Koen 2003; Reichert 2005; Rip 2004); questions about funding (CHET 2002; HEFCE 2005; HEFCE 2000; Philip 2005; Woods 2005); and concerns with graduation rates, duration of study and attrition (Bair & Haworth 1999; Earl-Novell 2006; Golde 2005; Lovitts 2001; Lovitts & Nelson 2000; OSEP 1996). This research is undertaken by academics, but also in studies commissioned by government, institutions and funders.

The second set of questions concern how to do doctoral education. What models should be employed (Boud & Lee 2005; Earl-Novell 2006; Fink 2006)? Which pedagogies are effective (Boud & Lee 2005; Burnett 1999; Chiang 2003; Love & Street 1998; Park 2005)? How is doctoral learning assessed (Lovitts 2007; Powell & McCauley 2002; Sankaran et al. 2005)? How does one develop academic writing (Aitchison & Lee 2006; Badenhorst 2007; Delyser 2003; Kamler & Thompson 2006; Lee 1998)? What is the supervision relationship

and how can it be improved (Aguinis et al. 1996; Armstrong 2004; Bartlett & Mercer 2000; Denicolo 2004; Edwards 2002; Mackinnon 2004; Malfroy 2005a)? In these studies the influence of disciplines and research cultures have emerged as having significant impact on the practice of doctoral education (Chiang 2003; Deem & Brehony 2000). More recently there are investigations into and reflections on the experience of doctoral studies (Ali & Kohun 2006; Back 2002; Bhavsar 2005; Lesko et al. 2006). Much of the work in this area is undertaken by academic development practitioners, by people engaged with doctoral supervision and by doctoral graduates.

But underlying many of these studies are meta-questions around the purposes and expectations of doctoral studies (Barnacle 2005a; Golde & Dore 2001; Hirsh 1982; McAlpine & Hopwood 2006; Neave 1996) which are sometimes phrased as questions about what is and ought to be learned in the doctorate (Bass 2006; Gilbert 2004; Lunsford 2006; Walker et al.). These represent the third category of research into doctoral education. Questions of how the doctorate meets the needs of the academic community and disciplines have been underrepresented in the literature until recently. There are signs of greater interest in this area with the recent introduction of the idea of doctoral graduates as "stewards of the discipline" (Golde & Walker 2006). This idea represents a significant step towards hearing what the academic community expects of doctoral education.

Research into postgraduate education in South Africa has not been substantial, although it is growing. Concerns at a national level revolve around the need to produce more doctoral graduates in order to support economic and social development, and to replace the ageing research and academic staff (Blankley 2004; Cloete & Galant 2005; Koen 2003; NRF 2007). Other research includes quantitative studies of throughput and graduation rates (Mouton 2007); investigations into the kind of research undertaken by postgraduates in science education (Laugksch 2005), and in public administration (Wessels 2007); and the impact of doctoral and master's degrees on research publications (Jourbert 2005).

There have been a number of papers that address postgraduate supervision (Hodza 2007; Kaunda & Low 1998; Nsibande 2007; Olivier 2007; Van der Westhuizen & De Wett 2002), including student views of supervisors (Lessing & Schulze 2002). Dietz et al report their experiences in supervision providing both theoretical insights and practical advice (Dietz et al. 2006). Jansen and his coauthors give voice to the student perspective and conclude that research learning is too complex to be reduced to a single "right way" (Jansen et al. 2004).

And there have been personal accounts of the experience of doctoral studies (Fataar 2005; Herman 2008). The practice of doctoral education has been the subject of at least two master's theses. At the University of Cape Town (UCT), Bailey investigated doctoral degrees awarded in South Africa and discussed the possibilities for change in the light of international developments (Bailey 2001) and at The University of the Witwatersrand (Wits), Machel investigated the doctoral programme in Education which was run by a consortium of South African universities (Machel 2006).[1] Doctoral education in South Africa has also been researched in the context of larger studies of doctoral education in Africa (Benneh 2002; Szanton & Manyika 2002).

There are concerns that research has in the past been mystified and discussions of how to broaden access to research (Christiansen & Slammert 2005; Ogude et al. 2003; Samuel 2000; Smit 1989). There are studies focused on developing junior academic staff (Christiansen & Slammert 2006; Cloete & Galant 2005); developing research at historically disadvantaged institutions (Glencross & Mji 2001:178; Samuel 2000) and at the Universities of Technology (Lues & Lategan 2006; Ogude et al. 2003); and how to manage and implement research partnerships between universities and other institutions that will support doctoral education (Kruss 2006; Mouton 2000).

What is lacking in the South African body of research are empirical studies that look at the practice of doctoral education more holistically and take into account the concerns of supervisors and the goals of PhD people. It has been suggested that "research directions in doctoral education might usefully include more complementary macro- and micro-level studies, more critical analysis grounded in empirical data, more fine-grained analysis of local activity and human agency, and more recognition of the broad range of stakeholder interests" (Pearson 2005:130). This research seeks to meet some of these needs.

This outline of research into doctoral education is admittedly sketchy. But this is intentional, serving only to map out the literature and position this study within it. Because of the wide ground covered in this study, relevant parts of the literature will be examined in greater depth in subsequent chapters.

[1] This programme is described in more detail in chapter two.

1.4 The research questions

The purpose of this study is to explore how academic staff and the people who do doctorates understand the PhD and how these understandings influence the practice of doctoral education and the resultant learning, learning experience and knowledge. The primary question which is to be addressed in this study is:

How do existing models and pedagogies of doctoral education shape the learning experience and the outcomes of doctoral programmes in South Africa?

It will be addressed in the following four sub-questions:

1. **What expectations of doctoral programmes are expressed or implied by national planners, academic supervisors and doctoral candidates?**

2. **What models of doctoral education are in use in South Africa and what pedagogies are employed in these models?**

3. **What are the learning experiences of doctoral people and how do they relate to the models of doctoral education in use?**

4. **What kinds of learning and knowledge result from doctoral studies?**

A brief examination of issues raised in the literature will throw some light on the choice of these four sub-questions.

Views of the nature and purpose of doctoral education have changed over time under the influence of different political and economic regimes (Leonard 2001:22-23; Chiang 2003:6). For example, in Britain in the 1980's, financial pressures were exerted to introduce taught courses in research methods reflecting a growing assumption that people undertake doctorates "not for their own development and pleasure in learning, or to contribute to a particular piece of knowledge, but in order to become professional researchers" (Leonard 2001:23). The past two decades have seen a shift towards training in preparation for a research career and a shift away from generating knowledge and preparation for life as a scholar (Chiang 2003:6). The term "doctoral research training" has become common (Blume 1995; Cloete & Galant 2005; Heen 2002; King & Dobson 2003).

It has been suggested that the production of knowledge is shifting outside of universities and increasingly takes place in teams of people brought together with agendas and methods negotiated by a range of experts across disciplinary boundaries (Gibbons 2000). This calls into question doctoral education that has as its goal socializing individuals into a disciplinary culture (Becher 1989:47). And doctoral graduates are increasingly being employed outside of the academy leading to suggestions that the doctorate ought to better prepare them for such careers (Golde & Dore 2001).

At a national level, the purpose of doctoral studies is viewed in terms of national skills needs: to train researchers to grow a national research sector (DST 2002), or to train academic staff for the tertiary education sector (CHE 2004b:90). At an institutional level, expectations of doctoral graduates at a research university may differ from those at a comprehensive university and will certainly differ from the expectations of a commercial company (CHE 2000:31-35). And finally, the individuals who undertake doctoral study have their own set of expectations which may range from better job prospects to personal growth (Hirsh 1982:198; Mouton 2001:4-5).

This leads to our first research question: *What expectations of doctoral programmes are expressed or implied by national planners, academic supervisors and doctoral candidates?*

Many different models of doctoral programmes are in use and there are debates internationally about these models (Chiang 2003; Eurydice 2005; Golde 2005; Heen 2002). Programmes vary from highly structured, with courses and research completed to deadlines; to highly unstructured, with individuals working alone to their own timetable (EUA 2007:9; Huisman & Bartelse 2001:69; Önnerfors 2007:322; Park 2005:200; Sadlak 2004). Doctoral programmes employ different pedagogies including personal and team supervision, lectures, seminars, workshops, peer learning, collaborative research, written assignments, and writing and presenting papers (Boud & Lee 2005; Dietz et al. 2006; Runquist et al. 2006; Sadlak 2004; Samuel 2000:69; Wits 2006a); and assessment of doctoral degrees can include submission of a thesis or dissertation, the oral defense of a thesis, submission of a portfolio of research products, creative artefacts or performances, written examinations or the submission of published papers (Malfroy 2005a:136; Morley et al. 2003; Rinne & Sivenius 2007; Sadlak 2004; UCT 2008b).

Models of doctoral education differ by country with, for example, the USA favouring more structured approaches and Britain and Germany favouring unstructured models (Sadlak

2004). In South Africa, the tradition is for students to work independently on a doctoral dissertation (Dietz et al. 2006:10; Mouton 2001:xi; Szanton & Manyika 2002:24). There have however, been some experiments with seminar-based programmes that include elements of research training (Dietz et al. 2006:10; Machel 2006; Samuel 2000:69; Szanton & Manyika 2002:24).

This leads to our second research question: *What models of doctoral education are in use in South Africa and what pedagogies are employed in these models?*

Different models of doctoral education lead to different experiences and different opportunities to learn. For example, doctoral people in the pure sciences are more likely to work as part of a team which gives them access to resources and support, and experience in large collaborative projects. But those in the humanities work in isolation and learn to manage research projects on their own (Chiang 2003:17; Deem & Brehony 2000). The third question explores how the different models and pedagogies employed impact on learning outcomes and the learning experience.

The status of doctoral people differs – in some models they are viewed as students, while in others they participate as researchers or as members of faculty (Deem & Brehony 2000:154; Huisman & Bartelse 2001) and these differences in status dictate what resources and support they have access to (Chiang 2003; Sadlak 2004). Different funding models also have an impact on the experience of PhD people (Huisman & Bartelse 2001; Sadlak 2004). Such elements of doctoral programmes affect the experience of doctoral study, which in turn influences what is learned, how well and how easily it is learned (Chiang 2003:20; Deem & Brehony 2000).

This leads to our third research question: *What are the learning experiences of doctoral people and how do they relate to the models of doctoral education in use?*

The fourth question explores the different types of learning that take place in doctoral programmes in order to understand what outcomes are being realized. In the process of completing a doctoral degree, one gains not only disciplinary knowledge, but also knowledge about research and conducting research (Boote & Beile 2005; Garbers 1996b:363; Pallas 2001). One learns about academic culture; the culture of the institution and department; how people communicate and interact within the discipline; and how to negotiate relationships and power imbalances (Becher & Trowler 2001:47; Deem &

Brehony 2000; Dison 2004; Leonard 2001:204-209). Often the learning is not obvious and may only be appreciated by the student some time after the degree is completed (Metz 2001:16).

Doctoral people experience intellectual development and personal growth (Cloete & Galant 2005:111) which has also been expressed in terms of constructing a new identity as an academic or a researcher (Christiansen & Slammert 2005; Dison 2004; Lesko et al. 2006; Malfroy & Yates 2003). Wenger has argued that learning the practice of a community involves constructing a new identity as a member of that community and argues that learning is an inevitable process that happens alongside our negotiation of that membership (Wenger 1998:8).

The fourth research question addresses these concerns: *What kinds of learning and knowledge result from doctoral studies?*

These questions will be investigated using qualitative case studies of doctoral education in four academic units representing different disciplines at three South African universities. The case studies include a School of Civil and Environmental Engineering, a School of Mathematics and Applied Mathematics, a Graduate School of Public and Development Management and a Department of English Studies. All are units that are successfully producing doctoral graduates and are based at three historically advantaged[1] English-speaking universities. Full details of the research design will be found in chapter three.

1.5 Structure of this thesis

In presenting this research there are two leading voices that must be heard, those of the doctoral people and the supervisors and in chapters four to eight they will dominate. Then there are supporting parts: the national policy makers, and institutional administrators. Those who research, write and theorise about doctoral education will act as chorus – setting the scene in chapters one and two and commenting on the players and their plight. My role is that of narrator. In chapters one and three I explain the plot; I interpret the proceedings throughout; and in chapter nine, I reflect on the lessons learned. Here then is the programme of events…

[1] In South Africa, historically advantaged universities are those that were reserved for people classified as 'white' during the apartheid years.

Chapter two is concerned with setting the scene. It is dominated by the chorus (the literature) and some of the supporting actors (policy-makers and administrators), as I contextualize the study. Together they give a historical perspective of higher education and how degrees developed in response to developing conceptions of knowledge, and to political and economic concerns, culminating in the Doctor of Philosophy. I describe current models of doctoral education. I also examine significant global trends and how these and other local concerns impact on doctoral education in South Africa.

In chapter three I discuss how the study was carried out. I start by elucidating my own epistemological standpoint and how I think about doctoral education as a complex adaptive system. I go on to explain in detail why I chose a multiple-case study design and how and why I selected the four programmes. I expand on the qualitative methods which I employed in data collection and analysis. And I reflect on the processes of doing the research and doing the PhD.

In chapter four I tackle the question, "What is a PhD?" Beginning with the literature and the policy makers at national and institutional level, I explore different understandings of the goals and purposes of doctoral education. It is here that the supervisors make their entrance and give their positions. From these different views, I conclude that there are three understandings of the PhD: the scholarly, the labour-market and the ongoing development views. I examine the assumptions which underlie each and the preoccupations which result.

In chapter five the doctoral people take to the stage to tell their stories. I draw on the life story approach (Bertaux & Kohli 1984) to interrogate who undertakes PhDs and why, and identify patterns of typical people undertaking doctorates in South Africa. I argue that, despite growing recognition that PhD people are not all destined for academic careers, research into doctoral education continues to be dominated by this assumption. I propose a model of *intersecting contexts* as an alternative to the *nested contexts* model for doctoral education (McAlpine & Norton 2006:6) and argue that my model supports a view of the PhD more appropriate for the current context of doctoral education.

The ways in which doctoral education is practised in the four case studies is examined in chapter six. The supervisors occupy centre stage, with descriptions of the doctoral programme in each of the four case studies and a comparison across the cases. This study confirms the views of others that the apprenticeship model of doctoral education

continues to dominate in South Africa, but reveals considerable variety in the specifics of practice by department and by supervisor. I identify four patterns of practice, and examine how individual supervisors construct their own practice in the context of the department or school, informed by their own understandings of the PhD.

In chapter seven the doctoral people return to tell us their experiences of doctoral study. I identify structural elements of the PhD programme which affect the experience and discuss the impact of the subjectivities produced by the discourses of doctoral education on the PhD person. I make use of the model of intersecting contexts to consider the degree of congruence between each PhD person and the programme in which they study and I show that people who find that their primary contexts are congruent with the PhD programme, or who are able to act to increase this congruence, have less problematic experiences.

Chapter eight examines the learning and knowledge that results from the PhD. The PhD people speak about what they learn and compare this with views of what they ought to learn. I examine theses produced in each of the programmes to establish what kind of knowledge gets produced and the similarities and differences across the cases; and I discuss the role of creativity in the PhD and the degree to which it produces original knowledge.

By way of conclusion, chapter nine draws together the work of the preceding chapters in a finale that addresses the overarching question, "How do existing models and pedagogies of doctoral studies shape the learning experience of doctoral students and the outcomes of doctoral programmes in South Africa?" The actors take their bows as I review the conclusions from the preceding chapters and discuss some unexpected themes which emerged from the research.

Chapter Two

THE STATE OF THE DOCTORATE

Contextualizing doctoral education

2.1 Introduction

Something resembling the doctorate is found in the system of *tutorialship*[1] in the mosques of Timbuktu, that "involved a very personalized study relationship between the Master and a few of his most promising students" (Lulat 2005:75). Those who progressed to the tutorialship were "well into their adulthood" and would "specialize in the in-depth study of a theological or legal work as the last stage of the curriculum" (Lulat 2005:74-75). This study concluded in the award of the *ijaza*, "a teaching certificate and a certificate of academic pedigree" specifying not only what had been learned, but also who the master was and the master's teachers going back several generations. The tutorialship bestowed the authority to offer legal opinions, and was only available to those with the right political, family and economic connections, as well as academic merit (Lulat 2005:75).

The doctorate, now widely regarded as a research degree, originated as a teaching qualification and it continues to include elements of both. On the one hand it is regarded as a necessary qualification for those pursuing an academic career, while on the other it is concerned with generating knowledge through research. The doctorate has evolved into a number of forms and continues to evolve. It has also become the subject of research, which in turn informs that development. This chapter provides a backdrop for the chapters that follow. It traces the history of doctorates, describes current models of doctoral programmes and examines the global and local pressures that influence doctoral education.

The scene is set in section 2.2 with descriptions of early forms of higher education and how learning in these institutions reflected social and economic concerns as well as understandings of knowledge. It goes on to show how the PhD came to be associated with research during the reforms of education in nineteenth century Germany and how it spread to other parts of the world. In section 2.3, I take a more local perspective and examine the history of higher education in Africa and South Africa, identifying the consequences for doctoral education. Section 2.4 discusses current models of doctoral education, with a

[1] Saad uses the term *tututorialships*. (Saad 1983)

particular focus on those in use in South Africa. In section 2.5 I consider a number of global trends that are impacting doctoral education today and how they play out at the local level. I also examine trends that are specific to the South African context. Finally, section 2.6 draws together the discussion with perspectives on the development and current state of doctoral education.

2.2 The origin and spread of doctoral education

I begin this historical review by examining early forms of higher education and their concern with teaching and with knowledge. The focus is on the goals and purposes of higher education, the relationship between higher education and society and the pursuit of knowledge. I go on to describe how degrees emerged in the early universities and became differentiated into what we now know as the bachelor's, master's and doctoral degrees and I discuss how the research PhD emerged from the nineteenth-century reforms of higher education in the German-speaking parts of Europe. Finally I discuss how the PhD spread to other parts of the world, being modified in the process to address local concerns.

Early forms of higher education

Arguably the oldest institution that bears resemblance to the modern university is the *per-ankh* or the House of Life found in Egypt in the period around 2000 BC. It was located within the temple and served as a library that housed religious, philosophical, medical and scientific texts as well as administrative records. There were recognised professions in Egypt from around 3000 BC and the *per-ankh* offered training for scribes, astronomers, medical and legal practitioners, as well as priests. Training was also provided in practical arts such as sculpture and other crafts. The scribes who presided over the *per-ankh* were trained not only in calligraphy, but also as philosophers and scientists who were respected for their understanding of and commentary on the works they curated (Lulat 2005:44-46). The per-ankh was thus a repository of knowledge, a place of teaching and learning, and a place where the limits of knowledge were examined and interpreted.

A second example is to be found in Ethiopia where formal education was introduced by the emperor Ella Amida after his conversion to Christianity[1] during the fourth century CE.[2] This system included at the highest level the monastic *Metsahift Bet* (or School of Holy Books) that educated the men of the elite classes for positions of leadership in the church

[1] This is disputed. According to Ponting, the kingdom of Aksum adopted Christianity in 333 under King Ezanaa. (Ponting 2001:408)

[2] Christian Era.

and state, and at the lower levels the *Qine Bet* (School of Poetry) and the *Zema Bet* (School of Hymns) – the rather narrow curriculum reflecting the concerns of the church. This monastic system of education persisted until the twentieth century but, since it depended for funding on the ruling monarch of the day, the fortunes of higher education institutions waxed and waned in line with "the degree of interest of the ruling monarch in intellectual and ecclesiastical pursuits" (Lulat 2005:55-56).

Islam originated in 622 CE and by 714 CE a vast Islamic empire stretched across Saudi Arabia, most of North Africa, Spain, Portugal, parts of France and what had been the Persian Empire. Islam was "a religion of the book and of learning, a society that esteemed knowledge and education above almost every other human activity" (Berkey 1992:6 cited in Lulat 2005: 65) and the growth of the empire led to widespread support for education. Teaching took place in *madrasahs*, usually attached to a major urban mosque and established through an endowed charitable trust. The madrasahs taught Islamic philosophy and law, Qur'anic language and recitation. Secular subjects like astronomy, medicine and mathematics were more commonly developed and taught in a parallel system of libraries, research institutes (*Bait al Hikmah*) and hospitals (Lulat 2005:69), although some madrasahs offered these as well.

The madrasah system of education provided skills for the administration of the empire and developed religious leaders and legal scholars (there was no distinction between religion and state). It provided a basic education which facilitated a literate society with written public records and belief systems. However, the education differed considerably in quality with the reputation of each madrasah largely dependent on the personal reputation of its teachers. A few came to be regarded as significant centers of learning[1] where scholars engaged in the ongoing development of religious teachings and interpretation of the law.

In China academies known as *shuyuan* existed from the 8th century although their specific forms changed in subsequent dynasties. Like early knowledge institutions in Africa, they housed collections of texts and provided scholars with opportunities for study and teaching of classic texts. The shuyuan were often financially independent and founded on donated land. As with the Islamic madrasahs, the reputation of the resident scholars determined the reputation of the shuyuan and served to attract disciples and colleagues. During the Song dynasty they developed into academies that offered structured learning environments

[1] Including those in Cairo (Al-Azhar), Tunisia (Al-Zaitouna), Fez (Al-Qarawiyyin) and Timbuktu.

(Hayhoe 1996:10-11). The other significant element of early Chinese education was the system of Imperial examinations which began in the 5th century and lasted in various forms until it was abolished in 1905 (Henze 1984:94; Yang 2004:314). It provided access to posts in the civil service on the basis of merit, at least in theory. Only about 5% of those entering the examinations passed, but those who failed went on to hold positions of influence in their local communities. The system ensured the loyalty of local elites and served to develop a uniform value system (Henze 1984:93-94).

Although schools were established during the late Qing dynasty (1644 to 1911) that taught Western science and technology, Chinese scholars were generally dismissive of outside knowledge and the higher education system created an elitist and internally-focused intelligentsia. (Yang 2004:315). Confucian philosophy promoted moral qualities, a love of learning and an understanding of a world structured in terms of hierarchical positions. The examination system influenced modes of education throughout East Asia and until recently people in China continued to regard education as only necessary for a career in the public sector (Henze 1984:93).

Universities in northern Europe grew from cathedral schools in which authorized teachers held classes in rented premises near the cathedral (Tanner et al. 1929:559, 563). In southern Europe, universities developed around the professions of law and medicine and the church played a more symbolic role (Tanner et al. 1929:560, 580).[1] The first universities were associations of teachers (in France and England) and of students (in Italy) set up to defend their interests (Tanner et al. 1929:561). The first universities to be deliberately established, as opposed to developing organically, were the *studium generale*[2] at Naples in 1224 and at Toulouse in 1230, both established by the Pope. By the end of the Middle Ages, most larger cities had their own universities. Knowledge in the early universities was classified into the higher faculties of Law, Medicine and Theology and the lower faculties of Philosophy (Tanner et al. 1929:560) and Arts,[3] which often played a remedial role for less able students (Previté-Orton & Brooke 1936:699).

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1 For a list of early universities, and the years in which they were founded, see http://en.wikipedia.org/wiki/List_of_oldest_universities_in_continuous_operation, accessed 1 November 2008.

2 The term *studium generale* described a place of learning that attracted students in large numbers. Over time the distinction between the studium generale and the university of masters (or scholars) blurred and they became a single institution (Tanner et. al. 1929: 591).

3 The exact configuration of the higher faculties differed by institution and region. Paris offered Philosophy and Theology, Bologna offered Law and Medicine, while Salerno offered only Medicine (Tanner et. al. 1929: 560).

The medieval universities were responsible for creating an educated elite who were able to direct "public and private affairs of all kinds" and they provided "poor men of ability" the opportunity to "rise to positions of power and influence" (Tanner et al. 1929:600). Individual doctors were public figures and "the university became a great organ of public opinion" (Tanner et al. 1929:598). But they were not only teaching institutions. They also sought to extend the boundaries of knowledge through debate and writing and through experiment and observation. "The alchemists in particular were assiduous experimenters, just as the astrologers were frequent observers and measurers of the heavens." (Previté-Orton & Brooke 1936:676)

These early knowledge institutions were concerned with accumulating knowledge, collecting and curating texts. They were places where scholars gathered to engage with each other to critique, comment and debate the collected texts and to produce new texts. The presence of scholars attracted those who sought to learn and thus these institutions became concerned with teaching, the transmission of knowledge. The knowledge institutions classified knowledge into domains according to social and religious understandings, and different kinds of knowledge were valued differently.

But alongside these noble pursuits, ran more prosaic purposes that served the interest of society and individuals. Knowledge institutions developed skilled administrators, medical practitioners and leaders in the church and state, effectively offering secure employment and positions of influence. They developed knowledge for social, economic and political benefit. And, except when privately funded, their fortunes fluctuated with the needs and interests of society and local rulers. In the next section we shall see that the nineteenth-century reforms of doctoral education which led to modern PhDs, were as much concerned with attracting fee-paying students and with the economic and political benefits of science, as they were with idealistic notions of generating knowledge and cultivating scholars. These parallel concerns – with knowledge and with the needs of society – continue to create tensions in modern higher education and underlie debates in doctoral education.

How degrees evolved in Europe

The titles Master, Doctor and Professor were originally synonymous – all referred to one who was licensed to teach (Noble 1994:8; Tanner et al. 1929:563). The license was

conferred by the Chancellor of the local cathedral[1] after assurances from already licensed masters that the candidate had attained the requisite levels of study (Tanner et al. 1929:563-4). The licensing of teachers originated in the twelfth century at the University of Paris, and by the thirteenth century the process had acquired some structure with written and oral examinations (Noble 1994:8). There were separate degrees for the lower and upper faculties. Typically a student would leave school at around the age of fourteen and spend five or six years studying towards the Master of Arts degree, and then spend a further six years studying towards the Doctor (or Master) of Theology (Tanner et al. 1929:571-573).

The gradual split between the terms Doctor and Master is accounted for in at least two ways. By some accounts it reflects different regional traditions with Paris and Oxford using the term Master while the term Doctor was used at Bologna and spread through Italy and into Germany. Other accounts point to a split between the lower faculties, whose graduates came to be more commonly called Master and the higher faculties whose graduates were referred to as Doctor (Noble 1994:8).[2] Doctors enjoyed social prestige and the right to earn a living as a teacher. The degree provided written, certified evidence of this right and, at least in theory, was accepted at any university (Noble 1994:9).

Doctorates in Theology, Law and Medicine were conferred for some 100 years before the first doctorate in philosophy, the Philosophiae Doctor, was recorded at Paris University. While some universities (notably those in England) continued to award the Master of Arts, gradually the practice of awarding doctorates in the lower faculties of philosophy and arts became common in the German-speaking parts of Europe (Noble 1994:10). However, the current form of the Doctor of Philosophy only emerged in the nineteenth century in the German-speaking parts of Europe and was shaped by the reforms of Humboldt (Noble 1994:9).

Germany's university reforms began in the eighteenth century, most notably in Gottingen. In an attempt to attract more of the better-paying students from the nobility, the curriculum in the lower faculty of philosophy was reformed (McClelland 1980:39-43). Extra-mural activities in the courtly arts, like dancing, drawing, fencing, riding, music and

1 In Italy, the archdeacon played a similar, but ceremonial role (Tanner et al. 1929: 580).

2 The bachelor's degree was initially a stage in completing the master's and later as a stand-alone qualification (Noble, 1994:8). The original meaning of the term Bachelor in the academic context was a "young scholar who was on probation for the mastership, and was already permitted to act as a subordinate teacher" (Tanner et al., 1929: 564). The term originates from the *knight bachelor*; a knight that had no others serving under his banner. In some parts of Europe, the bachelor's degree was introduced as recently as 1994 and "has not yet earned its value in the labour market" (Huisman & Bartelse, 2001: 51).

conversations in foreign languages, were introduced and proved popular (McClelland 1980:46-57). But despite the success of such reforms, there were continuing concerns about the state of universities including "backward curriculum, lazy and corrupt professors, students only interested in quick degrees as passports to jobs, student dissoluteness, lack of money, [and] a multiplicity of self-duplicating institutions" (McClelland 1980:69). Public debates highlighted three positions. The conservative position that held that "the object of education was to pass on a tradition of right belief through the use of traditional pedagogic techniques," the utilitarian position emphasized pragmatic training for professions and jobs in the state and church while for the neo-humanists, "the aim of education was to help unfold and realize the full potential of the personality" (McClelland 1980:106). It was this idealism of the neo-humanists that informed the reform process.

Humboldt's model of the university was based on four principles including the close integration of teaching and research, the freedom to choose what one teaches and learns, the importance of solitude and freedom in the pursuit of truth and the notion of a community of teachers and students (Krull 2005:99). These ideas led to a gradual change in the role of the university teacher, from one who was learned in a particular field to one who was an active scholar[1] and who was to both embody and inculcate "an almost infinite curiosity about the unknown or half-known, along with the tools necessary to pursue the search long after leaving the university" (McClelland 1980:122-124). From the emphasis on active scholarship and the linking of teaching to research, emerged seminars, in which a professor selected a few of the best students for regular meetings to discuss texts and report on individual research. These seminars were often held in the professor's home and a focus on "mastery of method" made the position of the student analogous to that of the apprentice in other crafts (McClelland 1980:181). Thus was born the traditional master-apprentice model of research education.

The development of these scholarly pursuits required a broad interest in philosophy and the work of enquiry was almost exclusively situated in the lower faculty of philosophy, which included what would today be recognised as subjects in science and humanities. For these ideal scholars, philosophical and theoretical knowledge was paramount. "The merely practical, applied or useful branches of knowledge … were despised" and the result was "the sundering of 'technical' and 'theoretical' education in the nineteenth century"

[1] The resultant flurry of hastily written books, monographs and papers drew criticisms similar to those leveled at the current culture of "publish or perish."

(McClelland 1980:125). Over time the Doctor of Philosophy became distinguished from the doctorates in law, medicine and theology by being awarded for original work, rather than for having mastered an existing body of knowledge. The "doctoral candidates would develop an independent programme of study before producing and defending a thesis" (Jamieson & Naidoo 2007:364) At the outset of the reforms, the focus of the scholarly life was philosophy, but this shifted over time to emphasise scientific knowledge. With the growing success of German science at the end of the nineteenth century, the status of the PhD as the highest qualification in scientific research was assured.

Humboldt is sometimes credited with introducing research into a university system that had hitherto been focused on teaching established bodies of knowledge. We find statements like "research as a central function of the university dates back only to the establishment of the University of Berlin in 1810" (Altbach 1995). This view, however, does not do justice to the work of early scholars concerned with the critique of existing bodies of knowledge, or of individual professors who conducted and published research.[1] What did change in the nineteenth century, was that research became expected of all university professors. The popularity and ongoing recognition that Humboldt's ideas enjoy lie more in a collective fantasy about academic life than in the reality. Even when introduced, reforms were not implemented in the manner in which he and other reformers envisaged (McClelland 1980:127). In a 2001 meeting of historians of higher education it was concluded that "a huge gap emerges between the social reality of nineteenth-century universities and their later, idealized reconstruction as 'classical' research universities" (Krull 2005:100). The same group also concluded that the spread of Humboldt's ideas to other countries involved "a highly selective process whereby certain elements were adopted and assimilated according to different needs" (Krull 2005:101).

The German reforms elevated the degree of Doctor of Philosophy above the doctorates in law, medicine and theology. It introduced the scholarly ideal of constant enquiry and the expectation that university professors were to be involved in the ongoing development of knowledge. And it introduced the idea that knowledge was not static; that a constantly developing body of knowledge meant that masters ought to be challenged and in time, surpassed. It also led to changes in the ways in which teaching took place, introducing

[1] For example, Thomas Willis published his work on cranial nerves and arteries while he was Professor of Natural Philosophy at Oxford in 1664.

seminars where research skills were developed by doing research under the supervision of a professor.

The PhD spreads to the global stage

Throughout the nineteenth century, the number of doctorates awarded in philosophy in Germany increased steadily. The University of Berlin awarded 59 PhDs in the period 1820 to 1829 and 242 in the period 1860 to 1869 (McClelland 1980:196). During this time the disputation was gradually replaced by a written (and usually published) dissertation, establishing the scholarly standard of the degree (McClelland 1980:198). By the end of the nineteenth century the university reforms in Germany, boosted by the growth of a non-university research sector (Clark 1995:34-35) were bearing fruit. In 1880 a correspondent wrote that "both in the quantity and quality of her original scientific work, Germany has far outstripped any other nation" (Noble 1994:17).

In the early nineteenth century Americans traveled to continental Europe and particularly to Germany to study, but by the middle of the century returning graduates had introduced the Doctor of Philosophy degree in the United States where the first earned doctorates were conferred in 1861.[1] The PhD "quickly assumed a very high and desirable status" and by the beginning of the twentieth century had become almost mandatory for professorial appointments at the leading universities (Noble 1994:12-13). The PhD in the USA required the study of 20 or more specialized courses, followed by an examination, the conduct of research, and the publication of a thesis which described the research and its results. Early programmes required proficiency in Greek and Latin, which was gradually relaxed to proficiency in two other modern languages and eventually dropped altogether (Noble 1994:15).

British universities of the nineteenth century were modeled on Oxford and emphasized teaching rather than research. They continued to offer the MA degree although an option to complete a research baccalaureate was available. By the turn of the century, doctorates were awarded in most fields but these were very different from the German PhD. They required at least five years of study beyond the first degree and were awarded based on the submission of a thesis representing original work of a high calibre. They were seen to be equivalent to the higher doctorate in Germany which was awarded for mature scientific

[1] The first American university to create a modern graduate school and award a PhD degree was Yale University, in 1861.

accomplishment. The PhD was considered unnecessary since "the conditions of study proposed for it were very similar to those of the London master's degree" (Noble 1994:21).

At the First Congress of Universities of the Empire held in 1912, the British colonies made strong representation that the PhD was needed to stop the flow of people from the colonies going to study in Europe. Germany's increasing dominance in research in medicine and the sciences was attributed to "the institution of the Doctorate as an award for research achievement" (Noble 1994:21). With a growing concern at Germany's achievements and under pressure from the colonies, Oxford reluctantly awarded the first Doctor Philosophiae, designated DPhil, in 1920 with Cambridge following in 1921. The award was made on the basis of a thesis prepared after lengthy study and research which makes a "significant and substantial contribution" to the field (Noble 1994:22).

Canada, with the proximity of the American example, had introduced PhDs in the early 1890s, but growth was slow due to limited demand for doctoral graduates in the slow-growing Canadian higher education sector (Noble 1994:17-18). The Canadian PhD continues to reflect the influence of the German and American PhD, with a combination of examined coursework and published research (Noble 1994:18-19). Other British colonies were slower to adopt the PhD[1] and students continued to travel to Britain or Europe to study. The delays in introducing the PhD stemmed from a lack of both facilities and qualified supervisors, and a "colonial obsequiousness" that included the belief that travel abroad was a necessary part of the PhD experience (Noble 1994:23). One effect of the delayed introduction of the PhD was the development of strong master's programmes (Noble 1994:24).

The doctorate in philosophy, the PhD, is now the most common doctoral degree. Its value is globally recognized and PhD programmes are being developed in universities worldwide. Despite the inertia of its 800-year-old history (Noble 1994:11), it continues to evolve. More recent developments in doctoral education are explored in the sections that follow.

2.3 Doctoral education in Africa and South Africa

Higher education only really emerged in Africa during the 1960s at the time of decolonization (Bentley et al. 2006:4; Lulat 2005:42; Szanton & Manyika 2002). The history of colonialism in Africa has left particular challenges for higher education and research in

[1] The first Australian PhD was awarded in 1948 (Noble, 1994:23).

general, and specifically for doctoral education. The research function is under-developed and poorly resourced and there is considerable ambivalence about what kind of knowledge is valued and who validates the results as Africans seek to resist "colonization of the mind" while participating in global research communities. In this section I examine elements of the development of higher education in Africa to show how this situation arose and the specific impacts on doctoral education. I go on to look more specifically at the situation in South Africa where the higher education system incorporates very different institutions, some of which are strong and others weak in research and doctoral education, and to discuss the local circumstances and concerns which impact doctoral education.

Higher education and doctoral education in Africa

Higher education in Africa is both very old and very new. Africa is home to the oldest "continuously operating institution of higher learning in the world," the University of Al-Karaouine or Al-Qarawiyin[1] located in Fes, Morocco which was founded in 859.[2] But many African countries opened their first universities during the 1950s and 1960s as colonial rule came to an end (Bentley et al. 2006:4; Szanton & Manyika 2002). The division of African history into pre- and post-colonial has been criticized,[3] but in the case of higher education, "the colonial period … marked a permanent rupture" (Lulat 2005:42) and left a lasting impact on education in Africa (Ashby 1966:147). This impact continues to be felt in doctoral education both overtly in the problems with resourcing doctoral programmes, and covertly in the ambivalence surrounding local and foreign programmes as this section explains.

The development of higher education in Africa differed by colonizer. For brevity, I consider here the development of higher education in Anglophone and Francophone Africa.[4]

European-style higher education was introduced to Anglophone Africa by Christian missionaries (Lyons 1970) who established the first higher education institution, Fourah Bay College, in Freetown in 1826 to develop teachers and pastors for educational and

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1 Both being transliterations of the Arabic: القرويين جامعة

2 Source: *The Guinness Book Of Records*, 1998, p. 242. However the title of oldest university is contested with debates centering on the definition of a university and the continuity of operation. Other contenders include Nalanda University in Bihar, India; the University of Magnaura in Constantinople – now Istanbul, Turkey and Al-Azhar in Cairo, Egypt. See http://en.wikipedia.org/wiki/List_of_oldest_universities_in_continuous_operation for a complete list.

3 The split between pre- and post-colonial carries implied ideological judgements of "savagery versus civilization, darkness versus light, evil versus good, stasis versus progress, primitive versus modern" (Lulat 2005:42).

4 For a discussion of education under the other colonizers, see (Lulat 2005).

missionary activities (Lulat 2005:209). It was only during the 1920s and 1930s, that the British established a number of colleges[1] which offered secondary schooling, post-school diplomas and degrees accredited by British universities. Reports of British government and private commissions and committees[2] reflect the changing attitude towards education in the African colonies. These reports recommended in 1841, the teaching of "nonintellectual pursuits, specifically vocational training"; in 1922 and 1925, continued vocational training; in 1933, that "selected institutions in Africa" be developed "up to a real university standard"; in 1937, that Makerere College in Uganda be developed to a university college; and finally, in 1943, that fully independent, "indigenous" research universities be developed that could become "the intellectual centers of their territories" (Lulat 2005: 214-223).

Reflecting these shifts, the colleges gradually became more independent and moved towards university status. But while they were modeled on British universities,[3] they tended to offer vocational and applied subjects (like medicine and engineering) or more general degrees with specialization at postgraduate level (Lulat 2005:238). The bias towards vocational education was the legacy of the belief, first voiced in 1841,[4] that Western education had to be *adapted* to the limited learning capacity of the African. The term adapted became "a codeword for nonacademic, vocational training" and continues to arouse suspicions among Africans today (Lulat 2005:214-215). Indeed, while calls for higher education from African nationalists helped drive the development of African institutions, many preferred to study at the more prestigious British universities (Lulat 2005:243).

By comparison, education in Francophone Africa developed more slowly. Missionary activity was discouraged and there was little reason to develop clerical skills because the colonial civil service was staffed by French people (Lulat 2005:335). However, the French made no attempt to adapt higher education for Africa, rather taking an assimilationist approach which included low-level local education for the masses and higher education in France for a small elite (the "black Frenchmen") (Lulat 2005:333). As a result there were

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1 Including, for example, Achimota College in Ghana (1924), the Kitchener Memorial School of Medicine in Sudan (1924), and in Nigeria, the Government College at Ibadan (1929) and Higher College at Yaba (1934) (Lulat 2005:217).

2 These included the Madden Commission (1841), the Phelps-Stokes Commissions to West Africa in 1922 and to East Africa in 1925, the Currie Subcommittee (1933), the De La Warr Commission (1937), the Channon Subcommittee (1943), the Elliot Commission (June 1945) and the Asquith Commission (July 1945) (Lulat 2005:214).

3 Although those in Malawi and Zambia incorporated elements of the US land-grant philosophy.

4 By the Madden Commission.

few higher education institutions in Francophone Africa in the early 1900s[1] and after the end of the second world war, thousands of Africans went to study in France with many choosing not to return to Africa (while denouncing French colonialism).

By the 1950's the policy of assimilation looked unsustainable, and the French moved to improve higher education in their colonies (Lulat 2005:338). The Ecole des Cadres Superieurs de Brazzaville was established in 1946 to teach administration, science and teacher training and during the 1950s and 1960s branches of French universities were created.[2] However, when independence came in the 1960s, Francophone Africa still had relatively few institutions of higher learning. National universities were established in many of the smaller countries during the 1970s in an effort to slow the migration of Africans to France. Universities were overseen by their French counterparts and France continued to finance them into early post-independence.[3] The African elite opposed the establishing of local higher education institutions. They wanted French qualifications that would enable them to compete on an equal footing and "relevance, at least for the first decade or so, continued to remain of far less importance than international currency" (Lulat 2005:340).

After decolonization, higher education in Africa suffered further setbacks during the 1980s with the World Bank arguing for a focus on primary and secondary education in Africa and forcing countries seeking funding to reduce spending on their national universities. This had a devastating effect on African universities with salaries and research funds declining and no investment in libraries and infrastructure. Many staff left the higher education sector or took second jobs (Szanton & Manyika 2002:2). Students and staff, mindful of political promises that education would become more accessible, resisted efforts to corporatize universities and introduce fees, and political unrest led to heavy police presences on campuses (Lulat 2005:233; Weber 2005:998). By the turn of the century there was a growing recognition that a strong higher education sector was important.

There are three consequences of this brief history of higher education in Africa which are of interest to our discussion of doctoral education. Firstly, the late introduction of research into African universities means that the research function is not well developed. Higher

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1 The Tananarive Medical Institute in Dakar (1896), the Ecole Normal William Ponty in Goree (1903), the Institut Francais d'Afrique Noire in Dakar (1938), a School of Marine Engineering in Goree, a school of veterinary science and a polytechnic in Bamako.

2 Including the university of Tananarive in Madagascar, the University of Dakar in 1957, the University of Abidjan in 1964, the Federal University of Cameroun in 1962 (became Yaounde in 1972) and the Centre of Advanced Administrative and Technical studies in Brazzaville in 1959 (became Marien Ngouabi University in 1971).

3 That only 5 of the 15 French colonies had universities made this feasible.

education institutions in Africa lack infrastructure, including research facilities, library holdings and technology infrastructure (Belay 2004; Benneh 2002:250,256). Access to the internet is costly and often unavailable with a shortage of technical skills making it difficult to run reliable ICT infrastructure (Szanton & Manyika 2002:13-15). Research work is poorly funded (Benneh 2002:255) and compromised by heavy teaching workloads so that few staff are actively publishing and universities lack a "critical mass of well-motivated researchers" (Benneh 2002:250). These factors make the institutions unattractive to prospective doctoral people and the best graduates choose to study abroad.

Secondly, there is the question about what knowledge is valued and hence what gets researched. The different approaches of the British and French colonizers continue to influence the topics being researched in PhDs in Africa. The French assimilationist approach left a more "cosmopolitan residue in the post-colonial universities" (Szanton & Manyika 2002:12) and a large proportion of the dissertations produced at universities in Francophone Africa address topics that go beyond national borders including "European history and literary and philosophical texts." By contrast, those produced at universities in Anglophone Africa are more likely to deal with issues within the national boundaries and are often "empirical studies focused on and relevant to very local conditions, processes, problems, and expressive forms, mostly contemporary, occasionally historical" (Szanton & Manyika 2002:12).

The lack of access to current intellectual discourses makes it difficult for supervisors to remain current and this leads in turn to a "loss of intellectual self-confidence" and "feelings of frustration and defensiveness" (Szanton & Manyika 2002:16). As a result much of the knowledge pursued by Africans in African universities fails to draw on and develop African systems of knowledge. There is a concern to break this dependency and to "produce their own PhDs capable of countering the still wide-spread pernicious view that the font of all wisdom lies elsewhere" (Szanton & Manyika 2002:16). While wishing to avoid "narrow Afrocentrism",

> *…there is growing demand that African scholars must also be able to critique and challenge external knowledges from their own perspectives, to reconstruct them for their own purposes, and to generate their own theories, models, analytical tools that variously incorporate and contest supposedly universal US or Eurocentric models. (Szanton & Manyika 2002:16)*

The desire to claim, develop and teach local knowledge and ways of knowing that are founded in local experiences and epistemologies and address local concerns, is however balanced by a concern for meeting global standards. And the need for validation by the metropoles persists and is supported by higher education policies that insist on publication in "overseas" journals, the use of "overseas" examiners and the benchmarking of institutions against those in Europe.

And thirdly, at a personal level, Africans continue to feel ambivalent about the value of local education as opposed to study abroad at more highly recognised institutions. While wanting to support and develop local education, for many the personal benefit of study abroad and emigration outweigh the broader benefit to society of remaining in Africa. The British policy of adapted education continues to make people suspicious of local institutions. In addition, completing a doctorate in an environment that is poorly resourced, lacking a strong research culture, where academic staff members are burdened with heavy teaching loads and the administrative procedures are cumbersome, can be slow and the "current and understandable expectation that realistically it will take six to eight years to complete a PhD is daunting and discouraging for many" (Szanton & Manyika 2002:19).[1]

Higher education and doctoral education in South Africa

The countries in Africa which emerged from colonization with the strongest education systems were those that were home to a significant settler population (Lulat 2005). In such countries the education provided for expatriates was generally of a good standard and formed a base from which to develop. This was the case in South Africa where the white population were provided with high-quality universities which today form the base of the higher education system.

[1] By way of comparison one might consider higher education in China which, like Africa, has very ancient roots and has undergone severe disruptions. Higher education was virtually closed down between 1966 and 1970, but revived in 1977 with the intention to "catch up with and surpass the most advanced world levels in major fields of science and technology by the end of the present century" (Henze 1984:111). Sweeping changes ensued, supported by substantial investment, in defiance of World Bank recommendations to the contrary (Henze 1984:137-140). Although Nanking University began offering doctoral education in 1913, there were not enough qualified staff for large scale doctoral programmes. Since 1977, China has sent increasing numbers abroad for doctoral studies with the expectation that they would contribute to higher education on their return (Hayhoe 1984:209). China also actively recruits internationally-trained scholars with a view to improving research and teaching and strengthening ties with other institutions (Robinson 2005). Unlike Africa, China approaches the west with a firm view of their own importance and policy is explicit about adopting only those aspects of western knowledge that do not conflict with their own values (Hayhoe 1984:206).

Higher education in South Africa can be traced back to 1829 when the South African College was established. In 1874 the University of the Cape of Good Hope became the examining body for the college. A number of colleges opened around the country including Stellenbosch College in 1881, the School of Mines in Kimberley 1896 and Rhodes University College in Grahamstown in 1904. After the Union of South Africa was established in 1910, the situation was reviewed and in 1918 the South African College became the University of Cape Town, Stellenbosch College[1] became the University of Stellenbosch and the other colleges were affiliated to the new University of South Africa (UNISA). Over time the colleges gained independent status including the University of the Witwatersrand in 1922 and the University of Natal in 1949 (Rosenthal 1961:547-548). Other colleges were established in the early 1960s and in time also gained university status. By 2002 there were thirty-six higher education institutions in South Africa; twenty-one universities and fifteen technical colleges, known as technicons.

Prior to 1994, higher education was divided along racial lines. Ten universities were reserved for white students, one for students of Indian descent, one for so-called coloured students and eight for black students (Szanton & Manyika 2002:23).[2] (UNISA as a distance university was open to all races.) White universities were further divided between the English and Afrikaans institutions with different ideological and political allegiances. The historically black universities were located in rural areas and although they were well funded (Szanton & Manyika 2002:23), the courses offered reflected the positions in society available to their students. They had difficulty attracting and retaining good staff and few had strong research programmes (Szanton & Manyika 2002:25). The historically white universities were situated in the main urban centres, offered a more comprehensive range of courses, attracted better staff and carried out more research (Szanton & Manyika 2002:24-25).

In 1996, the National Commission on Higher Education (NCHE) proposed a single higher education system focused on "increased participation, greater responsiveness and increased co-operation and partnerships" (Bundy 2006:11). Higher education reforms anticipated greater participation in higher education to address both the need for more high-level skills and the inequity in the distribution of skills across race groups. In 1997 the Education White Paper 3: "A programme for higher education transformation" presented a vision of

1 It had been renamed Victoria College in 1887.

2 It was possible to study at a university other than one designated for your racial group, but this required special motivation and ministerial consent.

a higher education sector transformed to support goals of equity, quality, efficiency, academic freedom and public accountability and the question of what *transformation* should mean for higher education became a preoccupation (DoE 1997; Cross 1998; Ntshoe 2004; Mabokela 2001; Taylor 2004; van Wyk 2003).

The change of government and the opening of universities to all races had devastating results for the historically black universities (Cloete et al. 2004:59-60). Student numbers declined and with them government subsidy funding (which is based on enrolments) and graduation rates. Many academic staff left for positions in historically white universities, business and government. Partly in response to the crisis in these institutions, a process was initiated in 2003, to restructure the higher education landscape into twenty-two institutions including universities and universities of technology. The process sought to rationalize higher education into "a national, integrated and coordinated yet differentiated higher education system that transcends the apartheid legacy" (Cloete et al. 2004:19). New institutions were created and others merged across traditional boundaries of race and language, although their pasts continue to influence institutional culture as well as the levels of resources and skills.

The history of higher education in South Africa has three consequences for doctoral education. The first is that South Africa has a number of well-established higher education institutions that run effective doctoral programmes and produce a steady supply of PhD graduates. These institutions have a substantial number of staff trained to PhD level, active in research and able to supervise, and are well equipped in terms of libraries, laboratories, research equipment and computing facilities (Szanton & Manyika 2002:24). This provides a base for further developing doctoral education. But South Africa also has many institutions that are ill-equipped to run doctoral programmes. Of the 1100 PhDs completed in 2006, only 7% came from the five historically black institutions that were not merged with historically white institutions.[1] Developing doctoral programmes is difficult in institutions which lack established research cultures and qualified supervisors (Samuel 2000:69).

The second consequence is that few black South Africans have doctorates or enroll in doctoral studies. In the higher education sector overall, the proportion of black African

[1] Not considering universities of technology, the five are, the universities of Fort Hare, Limpopo, Venda, Western Cape and Zululand.

students increased from 40% in 1993 to 61% by 2006,[1] but of the 9 828 people enrolled for doctoral studies in 2006, only 36% were black African, and it is not known how many of these were South African.[2] There are concerns that in the past research was mystified and exclusive (Christiansen & Slammert 2005; Kamper 2004:236; Motala 1991; Samuel 2000) and that it continues to be an elitist activity (Christiansen & Slammert 2005:1048) in which powerful myths continue to "limit who feel they can participate in research activities, who take on post-graduate studies and who succeed in these programs" (Christiansen & Slammert 2005:1058).

And thirdly, "the classic British model of supervision" (Dietz et al. 2006:9) on which doctoral education in South Africa was modeled, exerts a powerful influence. There is resistance to experimenting with new modes of postgraduate learning (Samuel 2000:65) and to the introduction of different doctoral degrees.[3] While universities in Britain have embraced diverse forms of doctorates including professional doctorates and structured doctoral programmes (Park 2005:190; Sadlak 2004:244), and the addition of explicit training elements (Huisman & Bartelse 2001:18; Sadlak 2004:244) attempts at similar innovations in South Africa are opposed as being of inferior quality (Samuel 2000) and the new Higher Education Qualifications Framework only allows for doctoral level qualifications which are research and thesis based (DoE 2007:29).

2.4 Models of doctoral education

> *… you sought out a potential supervisor, told them about your plans to study something and then, if they thought you were worth taking on, you would start a PhD with them … you would then potter around doing a PhD with whatever level of supervision your supervisor felt like providing, and be pretty much left in peace until you either submitted your dissertation … or gave up and did something else. (Rugg & Petre 2004:17)*

The traditional model of doctoral education, often described as the master-apprentice model (Huisman & Bartelse 2001; Önnerfors 2007; Sadlak 2004:82), entails the doctoral person working individually with a supervisor who guides them in doing research. It is a learning-by-doing model with the focus on doing research (Huisman & Bartelse 2001:69;

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1 HEMIS, Department of Education, http://www.education.gov.za/dir_docs/Update/2006/2006.asp accessed 25 Oct 2008.

2 The Higher Education Management Information System (HEMIS) classifies as black local and foreign African students. From the profile of PhD people on campuses and in this study, it is likely that a significant majority of black people enrolled for PhD studies are not South African.

3 WGD09

Sadlak 2004:78). While it can be an effective way to learn the craft of research, it has been criticized because the individual supervision relationship has the potential for exploitation, neglect and abuse (Grant 2001; Leonard 2001:92; Sadlak 2004:60). It is also believed to contribute to excessively long periods of study (Kehm 2007:309). Other models of doctoral education move away from the learning-by-doing model to include explicit training components, various forms of structure and the involvement of more people in a range of roles. In this section I discuss the range of models of doctoral education currently in use and how changes in the models are being driven.

European models

There have been significant reforms of undergraduate programmes in European universities to bring them in line with the Bologna requirements.[1] But reforms of doctoral programmes have been slower (Önnerfors 2007:327-330). It was only in 2003 that the Bologna process was extended to doctoral education – the so-called third cycle of higher education (Bologna 2003) – and reforms have intensified since then (Kehm 2007:307). European countries had widely varying doctoral programmes and in some countries formal doctoral education was relatively new,[2] so that there has been uneven progress towards implementing comparable three- to four-year PhDs.

Some changes have been made. For example, in Sweden, Flanders and Finland the *licentiat* (2 year degree between master and doctor) and *doktor* (2 year doctorate) have been replaced by a four-year doctorate with the *licentiat* becoming associated with professional training (Huisman & Bartelse 2001:51). But in Germany, Poland and Russia a tradition of awarding two different doctorates – the *doktor* and *habilitation* in Germany[3] and Poland, and the *candidate* and *Doctor of Science* in Russia – has made it more difficult for these countries to adapt (Önnerfors 2007:330-332). Different academic traditions also resulted in different views on whether doctoral research should be considered education at all, and in some countries there is resistance to the inclusion of training in the PhD (Önnerfors 2007:321).

Institutions in Europe offer an array of research degrees, professional degrees, doctorates for the creative arts, and fast track doctorates. They follow three broad models – the

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1 The Bologna process in Europe was initiated in 1999 with a view to creating comparable outcomes of degree programmes and facilitating articulation between European institutions (Bologna 2001; Bologna 2005; Eurydice 2005). There are some 46 countries participating in the process (Kehm 2007:307).

2 Doctoral education was formalized in the Netherlands in 1986 and in Norway in 1993 (Sadlak 2004: 99).

3 In Germany the *Doktor* leads to work outside of academia and the *Habilitation* was, until 2002 required for an academic career (Önnerfors, 2007:331).

traditional model based on a personal supervision relationship; structured programmes which combine formal training with elements of supervision; and graduate or research schools which bring together graduate researchers (EUA 2007:9; Huisman & Bartelse 2001:69; Önnerfors 2007:322; Park 2005:200; Sadlak 2004). Some countries offer only one of these models, for example Spain offers structured programmes while in France doctoral education is through graduate schools (Sadlak 2004:38). But many now offer different models with some, like Germany, Sweden and the UK, supporting all three (EUA 2007:9).

Some institutions offer European or joint doctorates which entail study at two or more European institutions (Kehm 2007:308; Sadlak 2004:42) and others are collaborating internationally (EUA 2007:14; Sadlak 2004:58). Some countries, like Italy and Norway, encourage study or attendance at conferences and seminars abroad as part of the doctorate (Sadlak 2004:66,117). There are programmes structured as research collaborations with industry which combine research and professional work in industry with formal university training (Önnerfors 2007:329; Sadlak 2004:93). In Britain the four-year New Route PhD has been introduced at about 20 universities. It includes coursework, generic skills training, research training and research under a supervision team.[1] Professional doctorates, which have a practice-focus, are becoming common, particularly in the UK (EUA 2007:14). In each case, the full-time PhD is intended to last between three and four years, but tends to last longer (EUA 2007:12; Sadlak 2004:55,83).

Many countries have introduced graduate schools as a way of organising doctoral programmes on a larger scale and structuring them to ensure more predictable results. These include Finland, France, Germany, the Netherlands, Sweden and the UK (Huisman & Bartelse 2001:94; Sadlak 2004:41,51,80). There are two types of graduate schools – those that group research postgraduates into an organisational structure within an institution that provides administrative support and transferable skills development; and those that organise doctoral people around a research area, discipline or project, sometimes operating across institutions (EUA 2007:10). An example of the second type are the French doctoral schools which are organised around a coherent scientific project (Sadlak 2004:43) and in which candidates are admitted to a research group or laboratory (Sadlak 2004:42).

Graduate schools are believed to have benefits such as creating a stimulating research environment and countering the isolation of doctoral study, providing uniform and

[1] See http://www.newroutephd.ac.uk/ Accessed 30th October 2008.

transparent administrative support, supporting supervisors in supervision tasks and providing training in transferable skills and career development opportunities (EUA 2007:10). As such they are believed to be more attractive to potential students and to better address the career needs of graduates (Huisman & Bartelse 2001:94). In addition the more structured approach is believed to reduce drop-out rates and improve efficiency (Önnerfors 2007:327; Sadlak 2004:57), although this is questioned (Kehm 2007:309).

Other responses to concerns with individual supervision have been to make use of supervision teams, to introduce supervision contracts, and to develop and monitor the performance of supervisors (EUA 2007:11). The French doctoral schools have a Thesis Charter; a contract between "the Doctoral student, the thesis director, the director of the laboratory, and the director of the Doctoral school" (Sadlak 2004:43), while in the Netherlands a training and research plan is drawn up for each person (Sadlak 2004:85). However, the professional development of supervisors "has not yet begun in many European countries" (EUA 2007:11).

In Europe, most doctoral studies are funded by scholarships, fellowships or grants (EUA 2007:16) awarded to institutions or to research units, and sometimes to individual doctoral candidates (particularly in Germany) (EUA 2007:17). In many European countries doctoral people are employees (teaching assistants or researchers) who are remunerated during their studies and enjoy employee benefits (Önnerfors 2007:329; Sadlak 2004:45,78), while in others they are regarded as students (EUA 2007:15). In Italy, unremunerated teaching duties in preparation for academic careers, have more recently become part of the doctoral programme (Sadlak 2004:73).

American models

Doctoral education in the United States is a large and diverse undertaking by public and private universities and it is difficult to generalize about doctoral programmes (Sadlak 2004:261). A variety of doctorates are offered, including the research-oriented PhD and a range of professional doctorates like the Doctor of Business Administration, the Doctor of Law and the Doctor of Education (Sadlak 2004:259). Some programmes accept people with bachelor's degrees, while others require a master's and the duration varies from three years in applied fields to six years in the sciences and more in the humanities (Sadlak 2004:262).

There are a wide variety of different structures, but a typical doctoral programme begins with two years of coursework covering advanced topics and training in research, followed by examinations. On successful completion, doctoral candidates prepare a research proposal, complete a research project, and write a dissertation under the guidance of a supervision team (Sadlak 2004:263). Other programmes use a portfolio-based review instead of examinations and include an oral defense of the dissertation.[1] Many people complete the coursework component but fail to complete the dissertation (Sadlak 2004:263).

Much of doctoral research, particularly in the sciences, is funded through research grants which provide for graduate assistants who are an important source of low cost labour for the research enterprise. As a result of this funding model, dissertations often relate to the work of a larger funded research project. In the humanities and social sciences, doctoral people are more likely to work as teaching assistants where they "provide much of the teaching in large undergraduate courses" (Sadlak 2004:260).

Doctoral programmes in the USA are widely regarded as successful and produce significant numbers of graduates.[2] The success of these programmes has resulted in an overproduction of doctoral graduates for a shrinking academic job market. With the higher education sector unable to absorb the large number of doctoral graduates, there is a growing trend for these graduates to seek employment outside of academia (Golde & Dore 2001:2). PhD programmes have been criticized for their research focus, for producing narrow specialists and for having limited relevance for the careers of graduates (Golde & Dore 2001; Sadlak 2004:269-272). This has led to concerns that doctoral programmes are not meeting the needs of these people and calls for doctoral programmes to be broadened (Golde & Dore 2001; Önnerfors 2007:328; Sadlak 2004).

African models

In 2002 Szanton and Manyika published a review of PhD programmes in sub-Saharan Africa and found that they are based almost entirely on the individual supervision model and involve individual research and producing a dissertation. Few African universities find it cost-effective to conduct coursework and examinations for the small number of doctoral people who enroll. In addition, there are few qualified supervisors making team supervision

1 Doctoral Degree Handbook 2008-2009, Stanford University, School of Education, http://ed.stanford.edu/suse/programs-degrees/PhdHandbook.pdf, accessed 1st November 2008.

2 Altbach estimates that "half of the world's Doctoral students are studying in the United States" (Sadlak, 2004:261).

impractical. In fact the individual supervision model of doctoral education makes it possible to run doctoral programmes in poorly resourced institutions.

> *Perhaps most striking and heartening is our finding that despite two decades of massive institutional trauma, there nevertheless remain in these universities, and sometimes in affiliated research institutes, significant numbers of truly impressive scholars, teachers, and intellectuals, – who would be a credit to universities anywhere in the world. And out of deep personal commitment they continue to supervise and produce PhDs. Indeed, these committed, but often relatively isolated scholars have been able to continue producing PhD students precisely because all of their universities still essentially follow the UK and European system of granting PhDs largely or entirely based on the dissertation alone. (Szanton & Manyika 2002:9)*

But a lack of suitable supervisors and active researchers drives many to pursue doctoral studies abroad in better resourced institutions. European donors continue to contribute to developing African scholars by funding full time study abroad (Szanton & Manyika 2002:30-32). However many graduates do not return to Africa, resulting in a "brain drain" from countries that can least afford to lose skills (Sadlak 2004:272). In order to address this problem, as well as the cost of foreign study, *sandwich programmes* have emerged which allow doctoral candidates to spend a year or a semester at a well-resourced university or research institute attending seminars, making use of library holdings or equipment and getting feedback on their work from senior scholars (Szanton & Manyika 2002:27).

Sandwich programmes are favoured, particularly for developing junior faculty, because shorter times away reduce the pressure on the remaining faculty to pick up teaching work and are easier on those with family commitments. They also provide opportunities to meet potential collaborators and candidates bring back new ideas that reduce the effects of intellectual inbreeding (Szanton & Manyika 2002:28). More sandwich programmes are available in the sciences, often through research institutes. In the social sciences there are fewer opportunities and those that do exist in policy research organisations, have been criticized for using doctoral people to collect data rather than to conceptualize the research projects (Szanton & Manyika 2002:30).

Recently, a number of innovative collaborations with universities in South Africa have emerged. The University Science, Humanities and Engineering Program in Africa

(USHEPiA)[1] allows junior faculty at the universities of Botswana, Dar es Salaam, Makerere, Nairobi, Zambia, Zimbabwe and Kenyatta to study towards joint degrees with the University of Cape Town (UCT). The programme allows for supervisors from UCT to spend time at the other universities working with a co-supervisor, thus also developing supervision skills. The Research Cluster Program (RCP) operated by the eastern seaboard Association of Tertiary Institutions (esATI) brings together doctoral people and faculty who are interested in researching in a common area for a series of workshops addressing sequential stages in their doctoral research (Szanton & Manyika 2002:35-36). And UNESCO has funded an exchange programme that allows African scholars to study at universities in the Western Cape (Szanton & Manyika 2002:31-32).

A search on the South African Qualifications Authority (SAQA) database in April 2006 revealed 979 registered doctoral qualifications. There are Doctor of Philosophy degrees in many specializations, usually abbreviated to PhD, but in some universities to DPhil (Bailey 2001:38). Some South African universities have a tradition of awarding senior doctorates to people who already have PhDs in recognition of "a substantial original research contribution"[2] and such degrees usually carry the faculty name such as Doctor of Science or Doctor of Commerce. But others, such as the Doctor of Music degree, are the equivalent of the PhD. There are professional degrees, such as the Doctor of Business Administration, but in content they resemble the PhD.[3] There are also a number of Doctor of Technology degrees registered, which reflect recent changes to allow Universities of Technology (formerly Technikons) to award doctorates.

In South Africa the PhD is completed after the master's degree, and involves doing research "at the most advanced academic levels culminating in the submission, assessment and acceptance of a thesis" (DoE 2007:29). The essential features are that it is a "*post-masters research* degree with a *specialization* in a specific field or discipline, culminating in a *thesis* which shows signs of *original* and *independent* work which makes a *significant contribution to existing knowledge*" (Bailey 2001:39, italics in original). In 2002, Szanton and Manyika claimed that "it is now common practice to insist on supplementing the research with course work or other training essential to facilitate or broaden the dissertation project" (Szanton & Manyika 2002:24), but while there are experiments with other models,

1 USHEPiA web site, http://www.ushepia.uct.ac.za/bg.htm accessed 30 October 2008.
2 SAQA qualification 9225, Doctor of Science at the University of the Witwatersrand. http://regqs.saqa.org.za/viewQualification.php?id=9225 accessed 3rd November 2008.
3 SAQA qualification 4911, Doctor of Business Administration at the University of Pretoria. http://regqs.saqa.org.za/viewQualification.php?id=4911 accessed 3rd November 2008.

coursework or other training is not widespread in South Africa. A recent publication on supervision in South Africa and the Netherlands says that,

> *In the case of the PhD, the notion of coursework is much less common. Students typically continue with the traditional model of a single supervisor supervising a strictly research-based thesis. (Dietz et al. 2006:10)*

And the Higher Education Qualifications Framework (HEQF) published in 2007, stipulates that "course work may be required as preparation or value addition to the research, but does not contribute to the credit value of the qualification" (DoE 2007:29).

While few programmes include examined coursework, there have been experiments with regular seminars and workshops to support people in the research process. The University of Durban-Westville (UDW) launched a seminar-based PhD in education in 2000 using "joint and co-supervisors" (Samuel 2000:76). And the University of Kwa-Zulu Natal (UKZN) now runs a Doctor of Education (DEd) that offers a structured programme of workshops that focus on preparing a research proposal in the first year, data collection and analysis in the second and writing the thesis in the third.[1] The University of Pretoria also runs a seminar-based PhD programme in education policy (Dietz et al. 2006:10). The UDW programme was positioned as part of a "campaign for social justice" (Samuel 2000:65) to make research more accessible and challenge notions of disadvantage and advantage. Such programmes have been resisted and have drawn criticism for doing formulaic research and "lowering standards" (Samuel 2000).

There are other experiments. The Wits Institute for Social and Economic Research runs an interdisciplinary doctoral fellowship programme which includes "a structured curriculum of seminars" which "leaves space for independent work, at the same time as exposing the students to key bodies of both theoretical and empirical literature and debate." Doctoral fellows are supervised by a committee and their research is expected to address questions related to the research programmes in the institute.[2] And a collaborative PhD in Education was run for a number of years by a consortium of South African universities.[3] This programme combined the resources of the universities to offer,

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1 UKZN Faculty of Education, Doctoral Studies web page, http://education.ukzn.ac.za/Doc_Studies555.aspx, accessed 1st November 2008.

2 WISER web site, http://wiserweb.wits.ac.za/people%20-%20doctoralfellowships.htm, accessed 1st November 2008.

3 The universities of Cape Town, Durban-Westville (now part of UKZN), Western Cape and the Witwatersrand.

> *…broad based theoretically and methodologically oriented course work and workshops at a central location, joint mentorship and supervision of the students by both local and invited international faculty … and home university based research and degrees. (Szanton & Manyika 2002:97)*

Although the programme included "a structured curriculum with course-work elements" it was "not a coursework programme." Rather the coursework elements and "mentoring, practical research experience, and exposure to work-place experience" were seen as supplementing the traditional "strong research emphasis" to result in a "hybrid model of research training" (Machel 2006:28,53). These and similar models provide stimulating research environments, ongoing support and comprehensive funding, but they rely on donor funding and are not sustainable in the long run.

There are some examples of graduate schools in South Africa. The Graduate School of Humanities at the University of the Witwatersrand offers facilities, administrative support and generic skills training for all postgraduates in the faculty and a home for those doing inter-disciplinary research which is not based in a school.[1] However most postgraduates in the faculty continue to be based in the discipline-specific schools and complete their studies with very little interaction with the Graduate School. The University of Cape Town also has a Graduate School in Humanities, but their focus appears to be on honours and master's studies.[2] Other graduate schools in South African universities tend to be based in professional disciplines and focus on master's degrees.

South African universities are also involved in doctoral programmes with institutions abroad. The African Economic Research Consortium supports a four-year PhD in Economics at the University of Cape Town. The structured programme includes examined coursework and the preparation of a research proposal in the first two years followed by two years of research. The programme is "grounded in African empirical realities" and six months of the second year is spent in Nairobi, Kenya. The Mellon Foundation provides support for PhD people at UCT to spend a year at one of six US universities[3] (Szanton & Manyika 2002:31) and UKZN and UCT are involved with a reciprocal programme which allows their doctoral people to spend time at the University of California in exchange for hosting American undergraduate students in South Africa.

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1 Wits Graduate School of Humanities web page http://web.wits.ac.za/Academic/Humanities/GSH/, accessed 30th October 2008.

2 UCT Graduate School in Humanities web site, http://www.humanities.uct.ac.za/postgraduate/gradschool/aboutus/, accessed 30 October 2008.

3 Berkeley, Brown, Emory, Michigan, Penn State, and Stanford.

Doctoral programmes have in common completing a substantial research project and writing a thesis or dissertation that represents a contribution to knowledge. But they differ in duration, the degree to which necessary skills are explicitly taught, the provision of formal courses to cover necessary advanced knowledge, examinations, the way in which supervision is organised, the degree of structure in the research process and the extent to which people study as part of a cohort. Differences in programmes reflect historical and regional differences as well as levels of resourcing and enrolments and views about the purpose of doctoral education. In South Africa the one-on-one supervision model dominates, although there are experiments with other models.

2.5 Global and local trends affecting doctoral education

Higher education increasingly takes place on a global stage and is subject to large-scale global trends. At the local level there are particular ways in which these trends play out as well as specific local influences to be considered. In this section I describe how these trends are shaping higher education and as a result, doctoral education.

Global trends

Globalization[1] has been driven by the development and spread of technologies that facilitate global travel and communication, and by economic developments that result in global competition for resources and markets and the growth of multinational corporations (Castells 2001; Kehm 2007:307; Toakley 2004). Globalization drives countries towards common priorities for higher education as universities are increasingly measured against global and regional standards (Alt 2002); must conform to global and regional norms for quality in teaching and research; and must facilitate articulation for increasingly mobile students (Eurydice 2005; Kehm 2007; Reichert 2005; Sadlak 2004; Yepes 2006). Universities increasingly compare themselves with institutions in other countries and there is increased borrowing and experimentation with the structure of programmes and ways of teaching at all levels, including doctoral education (Eurydice 2005; Kehm 2007; Reichert 2005; Sadlak 2004). Higher education institutions also begin to operate internationally, establishing physical and virtual presences in foreign countries (Moja & Cloete 2001:246-247) and they compete globally for talented staff and students (Mapesela 2002; Moja & Cloete 2001:247). The quest for common global standards has led to the growth of an *audit culture* in higher education (Shore 2002; Vidovich et al. 2000) with increasing regulation and

[1] Globalization is "a portmanteau concept employed by several disciplines", and the various meanings attached to the term reflect different ideological positions (Hopkins 2002:15).

measurement of what is taught and how it is taught. The impact of such quality control mechanisms is beginning to be felt at the level of the doctorate (Kehm 2007:315-316; Tinkler & Jackson 2002).

Alongside globalization has developed the notion of a knowledge economy (Drucker 1969)[1] or knowledge society (Hargreaves 2003) in which knowledge forms the basis of economic and social value. This has resulted in a greater demand for higher degrees from employers and governments and from individuals wishing to better position themselves in competitive labour markets. There are also an increasing number of large-scale intractable problems such as global warming, increasing energy requirements, disease, economic and social inequalities, and ongoing conflict, that need to be addressed at global or regional level (Toakley 2004; Yepes 2006). Such complex and systemic problems are driving an intensified search for knowledge that will aid in their solution (Axelrod & Cohen 2000; Handy 1993). The legacy of twentieth century science is a strong belief in the value of research and theorizing about problems. This faith in research is fuelling interest in the PhD to develop researchers who are increasingly viewed as important strategic assets (Kehm 2007:315). Globally there has been a steady growth in doctoral graduates (Jamieson & Naidoo 2007:364; Kehm 2007:315), to the point where some countries have a surfeit (Golde & Dore 2001:6).

The view of knowledge as a commodity, introduced the discourse of the market to higher education and institutions are encouraged to regard themselves as part of a global market serving consumers of training and research products (Jongbloed & Goedegebuure 2001; Kehm 2007:308; Pretorius 2001:74). Student customers demand training in professional and practitioner skills that have more immediate value in the job market and even at the PhD level there are concerns to match programmes more closely with job requirements (Golde & Dore 2001; Kehm 2007:308; Nerad 2004:197; Pretorius 2001:77).[2] Research must be designed around the requirements of funders, the consumers of research (Bentley et al. 2006:2), so that doctoral research projects may not address pedagogic concerns. In addition "doctoral degree holders are regarded as too valuable a resource to leave their

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1 The term originates in 1967 when T. J. Watson wrote in *Sat. Rev.* 14 Jan. 95/1 "From an industrial economy… we shall more and more become… a knowledge economy, with 50 per cent or more of our work force involved in the production of information." (Oxford English Dictionary, http://dictionary.oed.com accessed 30 April 2008) and was popularized by Peter Drucker.

2 In the US dissatisfied doctoral people, employed as teaching assistants, have formed graduate student unions and are pressurizing universities into reviewing their doctoral programmes and the learning and working environments (Nerad 2004:197).

education and training in the hands of academics alone" and doctoral education is increasingly the concern of "agents outside the discipline who have motives, purposes and goals that are not purely academic" (Kehm 2007:315-316). The pursuit of knowledge for knowledge's sake, the ideal of the scholarly life, is no longer valued (Kehm 2007:308). Philosophy, in its broad sense, has lost the ground it gained in the nineteenth century while professional qualifications and training for business enjoy ascendancy.

Since the 1980s there have been significant changes in the nature of academic work. Academics face larger classes as higher education expands, and an increasing administrative workload as the audit culture takes root (Golde & Dore 2001:6; Johnson 2006; Leonard 2001:10). Increasing managerialism means that the university no longer serves the interests of the academic staff (Johnson 2006) and academic life is characterized by increasing uncertainly (CHE 2004a:142; van Wyk 2005:8). Changes in funding arrangements mean that academics are increasingly involved in sourcing funds, particularly for research, and are expected to apply business skills in managing research and teaching programmes. They are also under pressure to improve their teaching and to complete formal qualifications in education (CHE 2004a:146; Kehm 2007:332). And academics are getting involved in developing policy, advising government, educating the public and consulting to industry (Gibbons et al. 1994:141). These changes in academic work have led to questions about how well the doctoral degree prepares for an academic career, and suggestions that it might appropriately include training in pedagogy and management (Bakradze et al. 2005:41).

Research work is also shifting towards research in teams with multiple research partners and across disciplinary boundaries (Gibbons et al. 1994; Moja & Cloete 2001; Pretorius 2001:78).[1] Researchers face more complex choices between methods and tools, which require a wider range of skills (Chiang 2003:7), and large research projects require project management skills (Marais & Garbers 1996). Partnerships and new funding arrangements introduce complexity around what research questions can be asked, ownership of knowledge and ethics (Chiang 2003:8). If the doctorate is to prepare people for research careers (ESRC 1991:2), a traditional doctoral research project may provide too narrow a

[1] The publication in 1994 of 'The New Production of Knowledge' (Gibbons et al. 1994) claimed a shift from Mode 1 to Mode 2 knowledge production, where Mode 1 knowledge production refers to the traditional development of knowledge in universities and research institutes, pursuing agendas set by disciplinary 'experts' and using discipline sanctioned methods. By contrast, mode 2 knowledge production can take place in other institutions, and across disciplinary boundaries, pursuing agendas and using methods negotiated by a range of experts. The thesis of Gibbons and his coauthors has been criticized with arguments that both modes of knowledge production have existed for some time and objections that the use of the term 'production' encourages a commoditised view of knowledge (Martin & Etzkowitz 2000; Pestre 2003).

view of research to deal with this more complex landscape. As a result there have been calls to establish research schools (Reichert 2005), and for doctoral education to include broader research training (Chiang 2003:9; Heen 2002:81; Pallas 2001) and more explicit training in research skills (Bakradze et al. 2005; Bologna 2005; Eurydice 2005; Sadlak 2004).

In summary, these global trends result in an increased interest in doctoral education to generate knowledge and develop skills. Universities are under pressure to change their doctoral programmes in order to align them with those in other countries, to make them attractive, and to address the changing requirements of academic and research careers. While in some respects, such as duration, there is increasing convergence of doctoral programmes, there is also increasing experimentation with structure, curricula and pedagogy.

Local trends

Until 1994 apartheid isolated South Africa and shielded higher education from the pressures of globalisation (Bundy 2006). But after the change of government, the discourses of globalisation and the knowledge economy were embraced. Policy documents voiced concerns to deliver "high-level competencies" for a "knowledge-driven and knowledge-dependent society" (DoE 1997:7) and to develop "professionals and knowledge workers with globally equivalent skills" (CHE 2000:10). Institutional mission statements spoke of embracing "globally competitive standards" (Wits 2008a) and seeking "international recognition" and "international competitiveness" (UP 2008). Internationalisation of higher education brought a number of foreign institutions (both public and private) into South Africa, operating in both distance and face-to-face mode. While it was acknowledged that these institutions "could be sources of innovation" (CHE 2000:17), there was concern about the lack of regulation and their impact on the public higher education sector (CHE 2000:17; Mapesela 2002; Sawyerr 2004:15). Quality assurance mechanisms were introduced and qualifications aligned with a National Qualifications Framework (NQF) that defines levels of study and articulation between levels.[1]

In keeping with the focus of the knowledge economy, South Africa seeks to establish a pool of skilled scientists for the science and technology sector (DST 2002:16). In addition,

[1] Soon to be replaced by the Higher Education Qualifications Framework (HEQF) which is directed specifically at higher education (DoE 2007).

research promises new ways to understand and tackle the complex economic and social problems facing the country. But South Africa currently has less than one researcher for every thousand members of the workforce, as compared with five in Australia and ten in Japan (DST 2002:54), and the scientific community is ageing[1] and not representative of the national demographic profile (DST 2002:54).[2] So, growing the number of researchers and changing the profile of the research community is a priority (DST 2002:25).

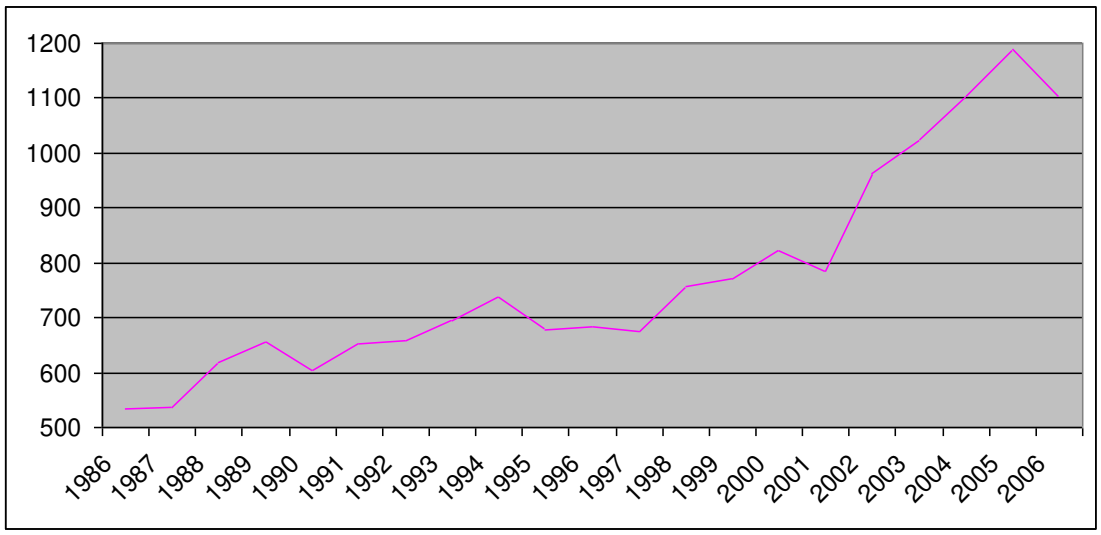

Figure 2.1: Doctoral degrees awarded in South Africa (Source: SAPSE and HEMIS)

As in other parts of the world, there has been a steady increase in doctoral enrolments and graduates, however the number of people enrolling for doctoral studies depends on the numbers coming through the higher education system and the participation rates in higher education are low compared to other countries (Mouton 2007:1088). On the other hand, the increasing integration of South Africa into the rest of Africa has resulted in growing numbers of students from SADC countries enrolling at South African universities (Szanton & Manyika 2002:26) and many of these students are enrolling for doctoral study.[3]

A particular pressure in South African higher education has been to transform universities in terms of their staff and student populations. The higher education workforce in South Africa continues to be "overly representative of white men in the middle- or late middle-age group" (CHE 2004b:91) and in 2006, 62% of academic (instruction and research) posts

[1] Publications by researchers over the age of 50 increased from 18% in 1990 to 45% in 1998.

[2] Scientific publications authored by black scientists rose from 3.5% in 1990 to only 8% in 1998 and women produce less than 15% of such publications.

[3] As far as I am aware, the information collected on doctoral people at a national level does not distinguish between South Africans and foreigners, so I was not able to quantify this.

were filled by whites.[1] The number of black doctoral graduates is growing (Mouton 2007:1084), but for the racial imbalance to be rectified requires greater access to and success in doctoral programmes by black postgraduates (Cloete & Galant 2005:9; DST 2002:16). South Africa struggles to staff its higher education institutions (CHE 2004b:90) and black graduates are in demand not only by universities, but also by the private and government sectors (Cloete & Galant 2005:9). In addition, doctoral graduates migrate out of the country (DST 2002:56; Blankley 2004:2-3; Kahn et al. 2004) and out of research into managerial and specialist positions (Blankley 2004:2).

As universities increasingly compare themselves with international benchmarks, there is pressure to improve the qualifications of academic staff. In South Africa and in other parts of Africa, it is common for universities to employ people with master's degrees in teaching positions at the levels of junior lecturer, lecturer and even senior lecturer. As is shown in the table below, in 2006 across all South African universities, only 9.3% of permanent academic staff at the level of lecturer have PhDs and this rises to only 35.7% at the level of senior lecturer.[2] At universities in other parts of sub-Saharan Africa, it is also difficult to attract and retain qualified staff[3] and a large proportion of academic staff at these universities do not have PhDs (Sawyerr 2004:30).

	Permanent academic posts in SA universities	Count of academic staff with PhDs	% of academic staff with PhDs
Professor	2105	1748	83.0
Associate professor	1661	1151	69.3
Senior lecturer	4162	1487	35.7
Lecturer	6220	580	9.3
Junior lecturer	972	28	2.9

Table 2.1: Permanent academic staff with PhDs by level at South African universities (Source: HEMIS, 2006)

[1] HEMIS, Department of Education, http://www.education.gov.za/dir_docs/Update/2006/2006.asp, accessed 26 October 2008.

[2] There are however disparities across the system. For example, at the University of Cape Town, 29.6% of lecturers and 57.5% of senior lecturers have PhDs, while at the University of Limpopo, the corresponding figures are 3.4% and 15.4%.

[3] The ongoing 'brain drain' of highly qualified Africans to other parts of the world has been well documented (Sawyerr 2004:30-32; Benneh 2002; Thapisa 2000; Szanton & Manyika 2002; Lulat 2005).

South African academics have experienced changes in the nature of their work with increased teaching and administrative workloads, the need to deal with a rapidly changing student body, and pressure to transform curricula and teaching practices. Academic staff are under pressure to improve their teaching skills and to complete formal educational qualifications (CHE 2004b:146) while institutional mergers have made teaching and collegial relationships across merged campuses more complex (Buller & Quilling 2005; Groenewald & Thulukanam 2005). Shifts towards managerialism have produced uncertainty and shifts in the organisational culture and values that academics find uncomfortable (CHE 2004b:142; Johnson 2006). These changes have not resulted in calls (within South Africa) to change the PhD so as to better prepare people for academic careers.

Changes in the modes of knowledge production have been less evident in South Africa. There is little inter-disciplinary, inter-institutional and inter-sectoral collaboration (Jansen 2002; Mouton 2000:458) despite the concept being embraced in support of both market and social justice discourses (Ravjee 2002). More pressing for doctoral education, in the context of transformation, are questions about who sets research agendas and what gets researched. The research questions raised during research training programmes focus on research for liberation or at least for development (Motala 1991) while doctoral people display a "misconception that the research was intended to change a social phenomenon" and ask "questions imbued with missionary zeal, aiming to make the world a better place" (Jansen et al. 2004:98). There is a concern that research, including doctoral research, should address national priorities (Kamper 2004:233-234) and calls for engagement between universities and communities that ensures useful research results and community control of definitions of research (Pretorius 2003:78).

So the global trends that have impacted doctoral education have been felt to a lesser extent in South Africa. While there is pressure to increase the number of doctoral graduates, this is only partly driven by the knowledge economy discourse and the need for research to solve problems. More importantly in South Africa, this pressure is about redressing past inequalities in education and in addressing the racial imbalance in research and academic staff. And while South African higher education institutions increasingly measure themselves against international standards, this has not had much direct impact on doctoral education. What experimentation there has been in doctoral education, has been focused

on improving access and success, particularly of black people, rather than on changing doctoral education to address the needs of changing research and academic careers.

2.6 Conclusions

The present forms of doctoral education are the culmination of a long history. This history is less of a noble tradition than a tale of many tinkerers trying to design and build an appropriate tool. That the purpose of this tool is in dispute, has made it difficult to agree on the form it should take and added to the variety of approaches and experiments.

Degrees emerged as teaching qualifications, and gradually became separated into three distinct tiers: bachelor's, master's and doctoral. These developments were often driven by practical concerns – to distribute teaching workloads or to ensure student mobility. The learning, skills and work expected in the different degree programmes were changed to suit employers and to attract students. Approaches to teaching changed with student needs and changing conditions in knowledge work. Current pressures to reform doctoral education in response to concerns for efficiency, relevance, attractiveness and improved learning reflect the same kinds of pressures that drove the development of degrees, including doctoral degrees in the past. But despite being founded on shifting foundations, doctoral degrees have become established as the highest level of educational achievement and an important part of research.

Shifts in the ways in which knowledge has been valued can be discerned. First, knowledge was viewed as received wisdom to be learned and accurately transmitted; the doctor was a teacher. In this view, there was room for only a few distinguished thinkers to extend the frontiers of knowledge and for these there was the higher doctorate which was awarded for the accumulated work of a lifetime. Then the notion of a continually enquiring state of mind arose and the Doctor of Philosophy emerged as evidence of this scholarly attitude towards the world. Gradually, the view of who could extend the frontiers of knowledge shifted to allow more people to participate in knowledge production. Original research came to be rewarded and theoretical knowledge more highly valued over the practice of the professions. The status of the Doctor of Philosophy grew to exceed that of the professional doctorates of Medicine and Law. More recently professional practitioners have asserted the value of their knowledge with the emergence of the professional doctorate.

Alongside these epistemic developments, there have been changes in the higher education sector as a whole. A growing number of people participate in higher education, state funding of higher education is declining, management of universities has shifted from being communities of masters or scholars to reflect business imperatives. The higher education sector is diversifying with different kinds of institutions emerging. Research is being increasingly funded by business or by government with earmarked funds for particular projects. This means that the directions for research are being set outside of the university, contrary to the notion of ongoing, open enquiry which underpinned the introduction of the original conception of the Doctor of Philosophy. Increasingly, higher education plays out on a global stage with those who study at the doctoral level being highly mobile. National boarders mean less to doctoral people than the location of like-minded researchers, research equipment and funding.

In tracing the development of doctoral education it became clear that while there is commonality in some of the developments and in large parts of the discourse, there are particular local concerns. In South Africa, an urgent need to produce doctoral graduates to staff the higher education sector (both in South Africa and in the rest of Africa) and the need to address intractable economic and social problems, drives a demand for research skills. But the higher education sector includes widely differing institutions; the dysfunctional school system limits the pool of potential graduates; and universities are exhausted by relentless change. Concerns with increasing access and decreasing the racial imbalance in the higher education and research sectors are prominent. At the same time, South Africans of all races continue to defer to the colonial metropoles and to view Britain and the West more broadly as the standard against which they must be measured. This results in excessive caution and inhibits innovation in educational practices.

In this chapter I have painted some of the backdrops against which the rest of this thesis will play out. In the next, I turn to the research project at hand and describe in more detail how the research was conducted.

Chapter Three

INVESTIGATING DOCTORAL EDUCATION

A PhD about PhDs

3.1 Introduction

> *Iterate: make repeated use of a mathematical or computational procedure, applying it each time to the result of the previous application (Oxford English Dictionary)*
>
> *Recursion: a computer programming technique involving the use of a procedure, subroutine, function, or algorithm that calls itself (Merriam Webster Dictionary)*

This is doctoral research into doctoral research, an investigation of the PhD process in the process of completing a PhD, or as a colleague described it, a *meta-PhD*. My interest in self-referential things was originally sparked in childhood as I pondered this tin while watching my mother bake. So intrigued was I by things recursive, that I studied mathematics, where iteration provides endless fascinating constructs to explore, and went on to work as a computer programmer.[1] Those with a background in mathematics will know that self-referential things have created considerable difficulty for mathematicians and are a great source of paradoxes. Take for example, the set of all sets which are not elements of themselves, and ask whether it has itself as a member. The self-referential nature of this project has been similarly intriguing and complicating.

This chapter explains in detail how I went about the study and in the process identifies some of the challenges I faced and how I addressed them. It includes the obligatory methodological reflections that I make in order to convince the reader that the research is sound and the examiner that I know something of the craft of research. But it also contains something of the story of my own PhD, a potential but problematic data element in the study.

I begin in section 3.2, with a discussion of the assumptions which frame the study and I explain my understanding of knowledge and knowledge generation. I go on in section 3.3, to explain the research design and how it is appropriate for this study. It will become clear that the research design, far from being established at the beginning, evolved over the

[1] My initial training as a programmer included a challenge to write a program, the output of which was its own code.

course of the project as my understanding of qualitative research developed and as the limits of possibility became known. The design was both contingent, as constraints and possibilities became evident, and iterative, as I repeatedly revised the plans.

In section 3.4 I describe the evidence that forms the basis of the research, the different kinds of data collected, how they were collected, processed and stored. I also reflect on the nature of evidence and the processes of data collection. Analysis of the data and the crafting of this thesis were an intertwined process so these are described together in section 3.5. It will become clear that the process of collecting and analyzing data, as well as the process of developing the thesis were iterative with each iteration building on the one before. In section 3.6, I reflect as a project manager on the process of doing doctoral research. I distinguish between the research project and my own learning project and discuss how I managed both.

3.2 Framing and assumptions

Before proceeding to the details of how this research was designed and carried out, it is necessary to detour into some discussion of the nature of knowledge and how research contributes to knowledge. This study is of necessity based on epistemological assumptions and beliefs which at some level cannot be defended. Rather, my defense is to make them explicit and to ask the reader to interpret what follows in the light of these assumptions. The mathematician in me wants to call these, as Euclid did, the "self-evident truths" upon which this thesis is constructed.[1] But alas, they are less evident than the truths of Euclidean geometry. I hope that I can at least make them as clear.

My approach is to begin with a biographical account of how my own conception of knowledge developed as I moved across disciplines to the critical realist position which I have adopted for this study. One of the consequences of my journey is that I bring a strong systems framing to education research and in the next section, I explain some of the terminology and features of systems which structure my thinking. In the third section I bring together these elements to discuss the implications of the critical realist position and the systems framing for this research.

[1] Euclid (or Eucleides) was a Greek mathematician who lived around 300 BC and worked in Alexandria. He wrote *The Elements*, which became the definitive text on geometry for almost 2000 years. The "self-evident truths" upon which geometry is founded are set out in Book 1 (Holme 2002:67-69).

An epistemological biography

I grew up in the happy, orderly hamlet of Pure Mathematics where things are True or False and there are clear rules for establishing which. The pursuit of knowledge was a matter of honing one's skills in the tools of the craft, occasionally crafting new and better tools and working to create new objects or new interpretations of well-known objects, guided by an aesthetic sense. In the second half of the twentieth century Mathematics was a peaceful place. The "crisis in the foundations" was past.[1] Respectable citizens could indulge their interest in Platonist objects during the week, provided they professed a belief in formalism on Sundays (Davis & Hersh 1983:321).[2] Beyond that there was little need to trouble oneself with questions of philosophy and rumours of the far-off, uncivilized lands of subjectivity and relative truth were childhood bogeys to be dismissed with the smug confidence of those who dwelt in a better place.

For most of my adult life I traded in the capitals of Business where the profit goal lends pragmatism, and philosophical questions are deferred until retirement. Knowledge in this metropolis is a sixth sense, constructed out of experience, of what to do and how and when. I was not required to explore epistemologies beyond my own, of which I was hardly even aware. It was only in designing software systems that I began to stumble along unkempt streets where one person's truth of how a term was defined, or how a process was handled, no longer matched with the truth of the next. There I observed the distress of positivist programmers trying to ascertain the right business procedures, when the truth of the matter was that business procedures depended on who you were, who you knew and the specific configuration of power relations (Dahlbom & Mathiassen 1993:181-185).

And so I set out into the wide, wild social sciences, feeling confident only because I was ignorant of the marshy, messy bogs I would have to navigate. I was soon mired in a postmodern relativistic bog, where knowledge is socially constructed and truth is "*necessarily* relative to the context within which it is constructed" (Moore 2004:154). I was bewildered by iterative uncertainties; not only truth, but any conversation depended on one's choice of words, and then one's choice of meanings for those words, and then… But after living in

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[1] The "crisis in the foundations" of mathematics emerged in the late nineteenth century with contradictions in Cantor's set theory. "To repair the foundations, three schools appeared on the scene and spend some thirty or forty years quarreling with each other. It turned out that none of the three could really do much about the foundations… we are left with a peculiar impression: the philosophy of mathematics was an active field for only forty years. It was awakened by the contradictions in set theory, and after a while went back to sleep." (Davis & Hersh, 1983: 323)

[2] Most mathematicians like to think that the objects that they deal with exist, out there, regardless of our knowledge of them, which is the Platonist position, but when pressed will concede that mathematical objects are probably the result of arbitrarily selected rules, which is the formalist position. See Davis & Hersh (1983: 318- 322) for a fuller discussion.

small towns and concrete jungles, the mud and the open air smelt good and I became an enthusiastic convert to the post-modernist extremes where knowledge is a collection of individually constructed fictions and "where truth is entirely a product of consensus values" (Baudrillard, cited in Norris 1990:169). These hyper-subjective spaces where I can create my own reality and my own truth, feel infinitely free.

However, playing in the mud would not get my thesis written. In order to make a claim to generating knowledge I needed some way of distinguishing knowledge that was of value from knowledge that was whatever I cared to think. And so, for the purposes of this exercise in knowledge-creation, I have set up camp in the relatively solid ground of critical realism (Archer et al. 1998). I work from the three assumptions set out by Moore (2004:174); (1) that knowledge is "conjectural and provisional" rather than infallible; (2) that truth claims can be evaluated by considering the reliability of the ways in which they were constructed; and that (3) there is a reality "out there" that is independent of my thinking, and about which I can make claims. Like the mathematicians, I assume that the objects about which I make claims during the week are real, but unlike them, the belief that I profess on Sundays, that all knowledge is socially constructed and equally valid, is sincere.

Of course this account itself serves as an excellent example of how epistemologies are themselves socially constructed. I readily accepted understandings of truth, knowledge and knowledge-making that were presented to me in each of the societies in which I lived and worked. And I continue to do so. The fact that I now acknowledge and live with multiple epistemological positions, is itself characteristic of research in education (Pallas 2001; Young 2001).

A systems view of education

Next it is necessary to understand that my journey through the world of information systems has led me to think of social practices, and of education in particular, in systems terms. Doctoral education can be understood as a system which is comprised of people including those who study doctorates, their supervisors and administrative staff; institutions such as universities, national agencies and advisory bodies, ministries of education and business and industry (de Boer et al. 2002:11); and of tacit and explicit rules that govern what they do and how they do it. What people do in the process of doctoral education depends on their understandings of the goals and purposes of the doctorate, their role in the system, their skills and abilities and their understandings of the rules that

govern the system. The ways in which people act influence the ways in which others act. For example, the ways in which academic staff practice doctoral education are influenced by policies implemented by institutional leaders, which are in turn influenced by the positions of national policy makers. In turn, the actions of academic staff affect the graduation rates, which impact on national policy.

A systems view considers the PhD people, professors, institutional administrators and national planners as well as the departments, disciplines and institutions as *agents* in a doctoral education system with different goals and different *strategies* or ways of behaving in the pursuit of those goals. The agents act according to their own interpretation of the goals and constraints of the system, and their own capabilities. The result is a *complex adaptive* system which changes over time as agents try out different strategies (Axelrod & Cohen 2000).

The system of doctoral education has a number of characteristics which make it particularly amenable to being understood as a complex adaptive system in the sense of Axelrod and Cohen (Axelrod & Cohen 2000). It is comprised of a large number of people and organisations with different ideas about what constitutes success and what strategies will ensure success. The individuals and organisations reflect on and change their behaviour and identities over time. While there are rules for the roles and interaction of the people and organisations in the system, there are different interpretations of those rules and the extent to which they hold. The system (of doctoral education) has been in existence for a long time and has changed over time. And as is common in such systems, the outcomes of interventions are unpredictable, but there is a desire to shape the system over time (Axelrod & Cohen 2000:xiv).

But most importantly, a system is *a way of thinking* about a complex social situation. It is not something "out there" but rather a mental overlay and a set of terms which I use to think about what takes place out there (Dahlbom & Mathiassen 1995:53). In this sense the systems perspective frames the way in which I think about doctoral education and predisposes me to seek to understand the people in the system, the goals of the system, the rules, the ways in which people behave, and the outcomes which result from the system.

The implications for this study

So what are the implications of a critical realist stance and a systems framing for research in education, and for this study in particular? Complex systems include many variables which

interact in unpredictable ways and change constantly as a result of external conditions and the actions of people. But they also change because the people who comprise them are growing and developing, so that the people who make up an education system today are not the same as those who made up the system a year ago (Tsang & Kwan 1999). In such systems it is not possible to find "laws that can accurately predict social events" (Tsang & Kwan 1999:763), rather social science seeks to explain or interpret. So this study builds descriptions and explanations for doctoral education in South Africa rather than laws and predictive relationships.

In trying to describe and explain the ways in which doctoral education takes place, I make use of the concept of culture as a means to identify "a logical, cohesive pattern in the myriad … behaviours and ideas that characterize" doctoral education (Fetterman 1998:20). The term culture has been interpreted in many ways, but I focus in this study on the cognitive definition of culture as "the ideas, beliefs, and knowledge that characterise a particular group of people" (Fetterman 1998:17). I am interested in the ideas and beliefs which people have about doctoral education and how these influence the ways in which doctoral education is carried out. In trying to discern these ideas and beliefs, I adopt a phenomenological approach which focuses on what is evident or observable, rather than on theories (Fetterman 1998:5). This approach includes cultivating a sense of wonder in order to see phenomena with new eyes, reflecting on one's own assumptions and developing critical self-awareness and seeking for the invariant elements of each experience (van Manen 2002).

I had originally planned to conduct this research as an ethnographic study because I was interested in the meanings which people attached to doctoral education. But ethnographic studies require living and working in the community that one studies for six months to a year or more (Fetterman 1989:35). I had hoped that I could reduce this time period as I was researching a familiar culture (Fetterman 1989:36), or that I could make use of a "modified ethnography" as Malfroy did in her study of doctoral programmes in Australia which focused on "specific interests about the culture, processes and practices" rather than the overall culture (Malfroy 2005b:44). But as the project progressed, it became clear that people at the sites were not interested in working with me on a longer term basis and that I would not be able to spend sufficient time at each research site to do justice to an ethnographic approach. Rather I made use of ethnographic tools and the phenomenological sensibilities characteristic of ethnography (Fetterman 1998:5) to conduct

qualitative case studies with a view to theory-building (Glaser 1992; Strauss & Corbin 1990). In some sense this work also ventures into autoethnography[1] in which "the researcher becomes the research subject" (Denzin & Lincoln 2002:xii) and "gives an account of herself (working, thinking, feeling and doing) in the social or workplace setting" (Henning et al. 2004:86).

Framing doctoral education as a complex system, leads to an interest in the people in the system and their understandings of the rules and goals that inform their behaviour. These rules and goals provide structure to the system. But this is not a structure imposed by the researcher as an outside observer (Spradley & McCurdy 1972:9), but rather a structure constructed by the people in the system from their own understandings. The system looks different to each person in it and as a researcher, my goal is to uncover these different views and to discern what commonalities might exist across them and why.

Critical realism argues that we can evaluate theories in terms of their "consistency, explanatory power, fecundity, comprehensiveness and simplicity," or in terms of how coherent they are and to what extent they result in "epistemic gain" (Muller 2000:152). While explanations which become the basis for prediction are regarded as particularly good (Kaplan 1964:350), those which provide insight and lead to new ways of understanding the world also have value. We generate better theories by making use of reliable ways of constructing claims. In the sections that follow I discuss in detail the research design, the approaches to collecting evidence, and the ways in which the evidence was analysed; in the process I explain in what ways and to what extent these approaches are reliable.

3.3 The research design

This study investigates how doctoral education is carried out, what meanings are attached to it and how people experience the PhD. Having established my own epistemological position and assumptions, this section considers the research design in more detail. I investigated four case studies of academic units (departments or schools) which successfully produce PhD graduates. The four cases were selected from four very different disciplines and across three South African universities. In the sections that follow, I explain why I chose to use case studies, how I selected the cases and how I gained access to the academic units. I also explain how some of my grander plans got shaped by concerns for practicality along the way.

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[1] Henning comments that autoethnography is "not yet mainstream methodology" (Henning, 2004:86).

The case for case studies

One of the challenges in researching doctoral education, is that it varies considerably between universities, faculties, departments and even supervisors. It is difficult to find a typical doctoral programme to study. In particular, because doctoral education is concerned with generating knowledge, it differs across disciplines with their different understandings of knowledge, different tools and techniques for conducting research, and different ways of structuring social relations (Becher & Trowler 2001:47-51). In addition, the very personal nature of the relationship between supervisor and supervisee means that the practice of doctoral education differs by supervisor, and the experience by supervisee. So I sought a research design which would enable me to examine the practice and experience of groups of individuals, with sufficient commonality between them, to allow comparison and discern patterns, but which would also allow me to look across disciplines.

In order to address these challenges, I designed the research around case studies of four academic units.[1] Each academic unit provided an opportunity to engage with a group of supervisors and supervisees who were working on research that had (at least some) similar characteristics, and practicing doctoral education within a common set of rules; while the selection of the four case studies allowed for comparison across disciplines. My justification for this design is in two parts. First I discuss the appropriateness of case studies for this kind of research, and then I discuss the choice of the case studies.

A case study is "an empirical enquiry that investigates a contemporary phenomenon within its real-life context" (Yin 1994:13). Case studies are appropriate when investigating complex social phenomenon (Yin 1994:13), especially when the focus is on the present (Yin 1994:4). They are particularly useful "when the boundaries between phenomenon and context are not clearly evident" (Yin 1994:13) and when the researcher cannot control events (Yin 1994:4). They are suited to answering how and why questions (Yin 1994:4) and to "understanding the dynamics present within single settings" (Eisenhardt 1989:534). Problems in education have been characterised as *postnormal*[2] – "urgent practical problems with high stakes and large and possibly irreducible uncertainties and complexities involved" (Gross & Strand 2000). Empirical research requires observing the education processes, in settings where the context is an inextricable part of the process, and with little opportunity

[1] The term unit denotes what is sometimes called a department and sometimes a school, depending on particular university structures and naming conventions.

[2] *Postnormal* is a reference to Khun's concept of "normal" science (Kuhn 1970).

to control events. Case studies, which are able to answer open-ended questions about how education takes place, are particularly suited to this kind of research.

Case studies can employ multiple levels of analysis within a single study (Eisenhardt 1989:534; Yin 1994:41-42) and I found it necessary to consider both the doctoral programme within the academic unit, and the individual supervisors and doctoral people, as units of analysis for this study. Examining the doctoral programme would enable me to draw conclusions about the rules that frame doctoral education and the expectations and practices at the level of the academic unit, while analysis at the level of the supervisor would highlight the expectations and practices of the individual and facilitate comparison with the group. Similarly, an analysis of both the individual PhD person and various groups of PhD people allowed a comparison of expectations, experience and learning at the individual and collective levels.

Yin warns against making a "programme" the unit of analysis (Yin 1994:22) because of the difficulty of delineating the boundaries of a programme. And indeed, I found that the boundaries between the programme and the environment were blurred. In this study the blurring of boundaries reflected different perspectives on doctoral education. For example, while staff in the academic unit might consider the research site to be outside of the boundary of the doctoral programme, for the PhD person, it was an important part of their doctoral experience. And while administrative staff might consider the group of people currently enrolled for doctoral studies to be part of the doctoral programme, these individuals often had no contact with each other and so did not consider the group to be part of their programme.

In order to cater for these different perspectives, I settled on two, overlapping, working definitions. The doctoral programme for the academic unit would include the procedures, people and activities, both in and outside of the unit, that were concerned with facilitating doctoral study within the school or department. And the doctoral programme for the individual PhD person would include those people, situations and activities that were encountered during their studies as a result of having enrolled for the PhD. Thus my investigations would include the physical and conceptual academic space in which people study; the processes of registering, studying, researching and graduating; funding and employment arrangements; and the staff of the academic and other institutions involved in doctoral education, in administrative or academic capacities. And it would also include the

people registered for doctoral studies; the activities in which they participated either individually or as a group; the institutional rules governing doctoral education; the places in which doctoral research is conducted; and the people and places which support the process of completing the PhD. As shall become clear in the chapters that follow, this breadth brought out elements of the environment which are important to doctoral education, but which sit outside traditional perspectives of the doctoral programme.

A multiple-case design

As already noted, disciplinary culture is likely to affect the specificity of any investigation of academic institutions. Becher suggests that the research base should cover more than one discipline "so that useful contrasts can be drawn" (Becher 1994:158). In studying doctoral education, this is particularly necessary because the nature of knowledge and research in different disciplines, as well as different social practices result in differences in doctoral education. In order to be able to identify similarities and differences across the disciplines, it was necessary to work with multiple case studies. Yin distinguishes between single and multiple case designs, suggesting that single case designs are justified when the case represents a critical case, an extreme case, a representative case or a revelatory case (Yin 1994:38-40). Multiple case study designs on the other hand, allow for comparisons across cases and can produce more compelling evidence (Yin 1994:45).

Multiple-case designs follow a replication logic, meaning that the cases are selected to replicate the work in different circumstances to see if the results continue to hold. They are not intended to represent a sample of cases (Yin 1994:45). Cases can be selected because they are expected to exhibit similar results (literal replication) or because they are expected to exhibit different results, but for reasons predicted by theory (theoretical replication) (Yin 1994:46). This study employs theoretical replication, with case studies selected to represent Becher's four disciplinary groupings of hard pure, hard applied, soft pure and soft applied (Becher & Trowler 2001:36). While additional literal replication within these categories would have been desirable, it was not attempted due to limitations of time and other resources.

The choice of cases

In order to ensure that I could observe doctoral education practices that were effective, I wanted to study academic units that were successfully producing doctoral graduates. I also wanted programmes that were relatively stable so that the effects of recent change would

not obscure the practice, and I needed to have a reasonable number of people currently studying and supervising who I could interview. So I limited the population from which the choice would be made to academic units running doctoral programmes where the form of the programme had not changed substantially in the past two years, that had more than five currently enrolled PhD people, and that had graduated at least five people since 2000.[1] There were also practical considerations in the choice of case studies. As I was funding the research and my living costs from a student fellowship, I selected two cases at Wits, where I was studying, in order to minimize the cost of travel.

Identifying suitable case study sites was less about selection and more about eliminating from the many possible sites (Spradley & McCurdy 1972:31). I initially searched web sites for departments with active doctoral programmes, bearing in mind the kinds of disciplines I wanted represented. My interest in well-functioning and successful PhD programmes meant that I focused on the universities with better research records. Of the four case studies suggested in the original proposal, only one was eventually included in the study. Of the other three, the first refused to participate, the second did not respond to any of my enquiries, and the third was rejected since, on closer inspection, it was a relatively new programme and had not yet produced any graduates.

The four case study sites were: the Department of Mathematics and Applied Mathematics at UCT, representing the hard pure disciplines; the School of Civil and Environmental Engineering at Wits, representing the hard applied disciplines; the Department of English Studies at UKZN, representing the soft pure disciplines and the Graduate School of Public and Development Management at Wits, representing the soft applied disciplines.

Gaining access is, in retrospect, largely a matter of luck, personal contacts and support from people in positions of influence. The first case study, civil and environmental engineering, agreed to participate after I approached the dean of the faculty and she petitioned the schools. The second, mathematics and applied mathematics, was the department in which I had once been a PhD student. The current head of school had been on the staff at the time and remembered me. Access to my third case study site, public and development management, was a matter of serendipity. I attended a course facilitated by someone who had a direct involvement with their doctoral programme, and she put me in

[1] While this might appear from the perspective of some disciplines to be a small number, from the perspective of others, it is not. I was not measuring success in terms of numbers of graduates, as much as in terms of steady production.

touch with the school. The final case, English studies, resulted from a direct e-mail appeal to the head of department, followed by a telephone call.

As it turned out, the case studies were all based at historically advantaged, English-speaking universities, so this study does not reflect the practice of doctoral education in the former Afrikaans-speaking universities or in those classified as historically disadvantaged. It is likely that there are differences in doctoral education across these institutions. This focus on the English-speaking universities was less by design and more a matter of the institutions to which I was able to gain access, but it means that the study does not give a comprehensive view of doctoral education in South Africa and replicating the study in other institutions would be desirable.

3.4 Collecting evidence

The data collection took place between March 2007 and November 2007, and proceeded sequentially through the four cases starting with civil and environmental engineering in March, mathematics and applied mathematics in April, public and development management in July and August and English studies in October and November. Consent was initially sought from the head of each academic unit or the person responsible for postgraduate study and then individually from each participant.

Idealistically, I had set out with the intention of establishing a relationship of collaboration with the participants (Pink 2001:40), but it quickly became apparent that few were interested enough in my research for this to be feasible. In some case studies I found more interest from supervisors in matters of supervision – they asked my opinion of supervision practices and for advice about improving supervision – and in one I was able to establish ongoing relationships with PhD people. But overall, my interaction with people was confined to the interviews and observations and it was not possible to establish collaborative relationships.

Data for each case study was collected using multiple methods and from multiple sources, as is common in case study research (Eisenhardt 1989:537; Yin 1994:91). Using different kinds of data assists in correctly identifying constructs and meanings (Yin 1994:33) and allows for triangulation (Fetterman 1998:95; Yin 1994:91). Data was collected from documents and through observation, conversations and interviews. The full catalogue of data collected for the study is detailed in Appendix A.

Ethical considerations

Since this research involved human participants, approval was sought and obtained from the Wits ethics committee in March 2007.[1] In case study research ethical issues need to be addressed at the level of the programme and the individuals (Yin 1994:143).

At the level of the case studies, there was a concern that harm could be caused to the doctoral programmes if the results of the research led to them being presented in a negative light. However, this was not likely as the programmes were selected on the basis of their successful records and the focus of the study was not on evaluation of the programme. Because I agreed with Yin (1994:143) that being able to identify the programmes would enable readers to integrate prior knowledge with the information presented in the thesis and make review of the cases more accessible, I requested that I be allowed to identify the case studies and those responsible for each of the four doctoral programmes agreed. They were given the option of reviewing the thesis in order to ensure that no unjustifiably negative reflections were made.

In the light of research that shows that doctoral people can find their studies traumatic (Lee & Williams 1999; Lesko et al. 2006), I was concerned that participation in the project could possibly lead to emotional distress or anxiety (Hammersley & Atkinson 1995:268). All supervisors and PhD people who were invited to participate were provided with a participant information sheet. Participation was voluntary and participants were assured of their right to terminate the interview at any time and to refuse to answer questions that they felt uncomfortable about. Since the participants were academic staff and PhD people, familiar with research methods and practices, it was likely that they understood the implications of consenting to participate. Consent was sought separately for audio recording of interviews and for photographing of private spaces. Two participants asked that their interviews not be recorded.

The data collected is confidential to the project and has been securely stored. Apart from myself, the only other people who had access to the data were the transcribers and I ensured that electronic copies of the data were erased from the machines on which they worked. Individual participants are not identified in the thesis. This has not been easy since there are a small number of doctoral people in each study and I discuss their research and life stories, making it possible for others on the programme to identify individuals. This

[1] Protocol number 2007ECE04.

means that there is a possibility that the code assigned to a transcript could be associated with a person and the other occurrences of that code would link statements to that person. In order to keep the interviews confidential I have coded the transcripts with two independent sets of codes and referenced passages that could be identifying with one set and all other interview data with the other. In two paragraphs I have omitted the case study part of the code to protect the identity of the academic unit and in one quotation I have withheld the reference altogether. Where I refer to individuals in chapter seven, I have used pseudonyms.

Documents

Yin points out that "documentary information is likely to be relevant to every case study topic" (Yin 1994:81) and I collected more than one hundred documents relating to the case studies. The collection of documents began before approaching the case study sites; I examined web sites for prospective case studies and collected information relevant to their doctoral programmes. Many of the documents collected for prospective case studies became redundant when those cases were rejected.

I collected documents in many ways. When I met with the heads of units and administrative staff to plan the research, I requested information about the unit, the doctoral programme and the people involved in it. When I interviewed people, I requested copies of documents that they referred to such as supervision contracts and proposals. I also used web sites, picked up brochures left for prospective students in the academic units and cut out advertisements for programmes from newspapers and magazines. I printed out e-mails and compiled spreadsheets of people in the units and of thesis information.

In the case study protocol, I anticipated collecting documents relating to access to the programme, completion and non-completion, the structure of the programme, pedagogies, student learning and the academic unit. As it turned out, it was very difficult to access any data about completion and non-completion. On all the case studies I was referred to faculty structures for this information. Some of these ignored my requests and others referred me back to the departments. I was not able to get any data about the duration of PhD studies or how many people did not complete, other than the views expressed during interviews. I decided not to pursue this data as it was not critical to my research and I was concerned that to do so might compromise the relationships I had established with the academic units.

In an effort to understand what kind of knowledge is generated in the course of the PhD, I analyzed recent PhD theses in the four case studies. In particular I examined the titles of the theses and what each claimed to have added to knowledge, and I looked at the structure and style of the theses. While I originally set out to examine theses produced between 2000 and 2005, I later extended these dates for the case studies where fewer people had graduated in order to get a bigger selection of theses. This data is analysed in chapter eight and a list of theses is included in Appendix D.

Case study	Number of theses	Years
Mathematics and applied mathematics	19	2000 - 2005
English studies[1]	8	1998 - 2007
Civil and environmental engineering	9	2000 - 2004
Public and development management	6	2005 - 2008

Table 3.1: Theses examined in the four case studies

Documentary evidence is useful to check spellings, titles and names, to "corroborate and augment evidence from other sources" and to provide inferences which can serve as clues for further investigation (Yin 1994:81) and I used the documents in these ways. For example, I used documents to confirm the titles of academic units and staff. I compared what people said about programmes, such as the social theory course, with documents such as the course outline.[2] I also used documents such as research proposals and course materials as data sources when evaluating approaches to knowledge generation across disciplines and in understanding what PhD people learned. And others, like handbooks and policy documents provided insight into how supervisors and supervisees were positioned in relation to each other. Many of the documents collected are not explicitly referenced in this thesis, but still provided useful background to the academic units, the doctoral programmes and the people.

Yin warns that, because of their tangible nature, there is a temptation to view documents as accurate and lacking in bias (Yin 1994:81). And during the course of the study, I became aware of gaps between written descriptions of requirements and the understandings that people had of those requirements (Backhouse 2007b). These gaps proved to be useful pointers to different assumptions, beliefs and practices.

1 That is, from the departments at different institutions which were merged to form this department.
2 WPD08

Observations

Much of the work of doctoral study is carried out in isolation or in private correspondence and conversations between supervisor and supervisee. This limits the possibility for observing doctoral education. I was hesitant to observe supervision meetings, because I felt that my presence would be too intrusive, so I focused on observing more public doctoral seminars, research seminars,[1] lectures and workshops as well as informal interactions like teas. I also observed and participated in many of the doctoral seminars on the Wits campus that are open to all research postgraduates and observed training workshops for supervisors. However, as some of the case studies had very little interaction outside of supervision meetings, the observations resulted in limited data.

I had considered using participant observation (Fetterman 1998:34), the "conscious and systematic sharing, in so far as circumstances permit, in the life-activities … of a group" (Kluckhohn 1940, cited in Coy 1989:115). Participant observation enables one to gain access to events that might otherwise be inaccessible, to gain an insider perspective and to manipulate minor events (Yin 1994:88). However, I found the extent to which this was possible, was limited. I found it difficult to participate and be a researcher at the same time (Yin 1994:88). For example in doctoral seminars, I found it difficult to follow and contribute to the discussion while also taking note of what was going on in the room. As a result I took turns to do each. In some instances I stayed out of the discussion and focused on observing and taking notes, while in others I dispensed with observing and participated. When I participated, I wrote afterwards about my experience and impressions as a participant.

The intention behind observations was to gain an understanding of the processes of doctoral education, the experiences of the PhD people and the culture of the discipline and the academic unit. Ideally one seeks to "capture the emic view" (Henning et al. 2004:83) that insiders have of their situation and experience. However, as Henning argues,

[1] Throughout this thesis I distinguish between *doctoral seminars* which are primarily for the benefit of doctoral people and *research seminars* which are for the benefit of a wider group of researchers, but in which doctoral people are invited to participate.

> *…a researcher cannot simply enter a group and hope to see the world through the eyes of the members unless the field visit is prolonged… Far more honestly, you could say that the aim is to capture what is available to your observation – and that would be either constrained or facilitated by your existing knowledge and understanding. (Henning et al. 2004:83)*

I found that being a doctoral person myself made it easier to participate in some of the formal and informal interactions. Other PhD people seemed to accept my presence and were happy to talk to me about my research and their experiences. For example, when I attended the social theory course in public and development management, I was invited to visit the office which the full-time PhDs shared and have tea with them. But my own position also made it more difficult to discern how others were experiencing their doctoral education because my own experience loomed large.

Interviews

At each case study, interviews were conducted with doctoral people and with staff involved either in supervision or the administration of the PhD (or both). Where possible, all those registered for the PhD and all those supervising PhDs were invited to participate in the study. In two cases it was not possible to get a complete list and contact details of doctoral people and I worked from lists compiled by members of staff from memory. Generally people were invited to participate by e-mail, but I also knocked on doors and requested interviews in person, and in one case study I had the opportunity to describe my research and invite participation during a departmental gathering. I interviewed all those who agreed to be interviewed – a total of 64 interviews. The breakdown of these interviews across units and roles is given in the table below.

Academic Unit	**PhD people**	**Staff**	**Total**
Civil engineering	7	3	10
English studies	6	7	13
Mathematics	12	11	23
Public management	11	4	15
Education (pilot)	2	1	3
Totals	**38**	**26**	**64**

Table 3.2: Summary of interviews conducted

The purpose of the interviews was to collect narrative data about seven different subject areas relevant to the study. Firstly, I wanted to get some background about each individual and understand something of their careers and in the case of PhD people, why they were doing a PhD. Secondly, I was interested in what they thought a PhD was, what set it apart from other degrees and perhaps what they thought it ought to be. The third area concerned how the PhD was structured, what stages or procedures were expected and in what time frames. Fourthly, I asked about the pedagogies employed in the PhD – how people learn. Here I explored the supervision relationship, as well as other formal and informal ways of learning. The fifth section of the interview explored what was learned and probed conceptions of knowledge and practices of knowledge generation in the discipline. The sixth section discussed the experiences of doing a PhD or of supervising. Finally, the interview addressed issues of the environment including what resources and funding were available.

The interviews were cultural (Rubin & Rubin 1995:195), focused on "listening to what people say rather than posing detailed and focused questions," and aimed at uncovering "how people see, understand and interpret their world" (Rubin & Rubin 1995:195). The objective was to understand the meaning that PhD people and supervisors attach to the different elements of the programme, the processes involved, the interactions and to getting a doctorate. The interviews were open-ended, although they were guided by interview protocols that outlined the areas to be discussed and suggested probing questions that could be asked around each topic. For example, in trying to understand how students viewed supervision, they were invited to: "Tell me about your supervisor and your relationship with your supervisor." This could be probed further by asking, "What do you expect from your supervisor?" or "How did you choose your supervisor?" There were separate interview protocols for students and staff, but they followed the same pattern and differed mostly in how the questions were phrased. The protocols are included in Appendix B.

Of course the seven subject areas are not mutually exclusive and I found that people sometimes addressed related subjects before I had asked those questions. When this happened I went with the flow of the conversation and changed the sequencing of the questions. Generally the approach was to introduce the subject area and invite comment, and then to let people talk while making comments to reassure them that I was listening and to encourage them to keep talking. I interrupted to clarify points or to change the

direction of the conversation. Sometimes the conversation strayed into other related discussions and I allowed these to continue if they seemed interesting or valuable. Such flexibility in case studies has been described as "controlled opportunism" (Eisenhardt 1989:539). I closed the interviews by asking people to add anything that they felt was important that had not been discussed and this elicited some interesting comments (Henning et al. 2004:76).

Some of the staff members played an administrative role and in interviewing them, I asked more direct and factual questions about the processes surrounding the PhD. These topical interviews[1] (Rubin & Rubin 1995:195) gathered information about how students are recruited, entrance requirements, the application process, the duration and modes of study, the activities students undertake, the procedures for monitoring progress and the forms of assessment. This helped to understand the structure of the programme and the pedagogies in use, from the official perspective. For these interviews, I compiled questions from my developing knowledge of the case study. An example of such questions can be seen in Appendix B.

In these "discursively oriented interviews," interviewing is "an act of knowledge making" in which the interviewer and interviewee are "co-constructors of the meaning" (Henning et al. 2004:57). They can be viewed as "a product of the interaction and desire for understanding between teller and listener" (Peacock & Holland 1993:372). The accepted discourse of being interviewed includes the expectation of a friendly and open discussion (Henning et al. 2004:58) and I found that this was generally the case. Being interviewed involves a process of organizing one's experiences (Henning et al. 2004:63-64) as one recalls, conceptualizes and labels one's thoughts during the interview (Henning et al. 2004:59), in accordance with one's understanding of being interviewed and the expectations of the researcher. I was made acutely aware of this process when I was myself interviewed by a colleague for her research.

On being interviewed **(September 2007)**

I was interviewed two days ago by a colleague, about my experiences of master's and doctoral supervision. Being interviewed gave me insight into being on the other side of the interview process. I found the experience strangely disturbing.

[1] Topical interviews involve specific questions and are aimed at collecting 'factual' information rather than understanding shades of meaning.

> When the interview began I felt unexpectedly nervous – concerned about what I should and should not say. That is unusual for me because I'm an outspoken person and generally unafraid of the consequences. I was aware that I should provide interesting data for my colleague – one wants to please. But I had to tell a credible story; to present my relationship with my supervisor in a way that both accounts for my exasperated comments to my colleague in the past, and does not do my supervisor a disservice.
>
> I became aware that I was at pains to portray my supervisor in a good light. Not only because I thought it prudent, should he ever read the transcript (and promises of confidentiality did not reassure me that he wouldn't), but also because doing so is part of my own need to construct a narrative of a successful PhD experience. As a successful student, I am able to work around my supervisor's shortcomings, and recognise and draw on his strengths.
>
> The interview opened questions for me that did not exist before. When asked about the power relations in my early experiences of master's supervision, I was initially taken aback since I had had no awareness of possible power issues at the time. I spent the next two days reflecting on how issues of power could have been at play, unrecognized by me. I found this unsettling and distasteful since it raised questions about the rather trusting relationships I had had with my earlier supervisors.
>
> I keep running through the interview in my head. In such a short time and speaking off the cuff, did I represent things well? Did I explain myself? Was my account coherent or did I expose myself? Being interviewed had an emotional impact that, as interviewer, I had been only theoretically aware of. Spending the past two days thinking about what I said and how it might have come across, moved that theoretical awareness to a lived experience which leaves me with greater respect for those who refused my own requests for interviews and deeper gratitude towards those who agreed.

So an interview reflects a partial truth for the teller as they consciously edit, omit and include elements and describe their life in terms that (1) make sense to themselves (2) meet what they perceive to be the needs of the researcher and (3) are mediated by the degree to which they trust that the research will not expose them.

Organizing the evidence

This study resulted in a substantial collection of data[1] which required careful organization. Wherever possible I made use of technology and most of the data was stored both electronically and physically. I devised an elaborate backup system for the electronic data, keeping multiple copies and cutting data regularly to CD. For each case study I used a

[1] Much of the data collected has not yet been used.

spreadsheet to record the data collected, including the type of data, who or where it was sourced from and on what date, and other relevant information.

I assigned a unique reference to each piece of evidence collected. The first three letters of the reference reflected the case study and the evidence type, and this was followed by a unique number. The letters used for the case study and evidence type codes are shown below. Thus the code WCI07 refers to the 7th interview conducted in the civil and environmental engineering case. There was some evidence that related to more than one case study and this was coded separately.

Case study codes		**Evidence type codes**	
WC	Civil and environmental engineering	D	Document
CM	Mathematics and applied mathematics	I	Interview
WP	Public and development management	T	Interview (alt)
KE	English studies	C	Conversation
WE	Education (pilot)	O	Observation
WG	Evidence applicable across case studies		

Table 3.3: Codes used to reference data

Clear referencing of data makes it possible to trace conclusions back to evidence and make explicit the different data sources which point to the same conclusion. However, as discussed above, confidentiality concerns led me to use two unrelated sets of codes for the interviews. Where I referenced interview transcripts and the content might lead to identifying an individual (such as references to their research or their life stories) I used the alternative T codes. For all other references to interview transcripts I used the I codes. The numbers assigned to the T and I codes were sequenced differently so that the reader cannot associate them. This ensures that views expressed by an individual cannot be linked to any identifying information.

3.5 Aspects of analysis

In this section I review the approach taken to the processes of analysing the data and developing the thesis. These were not sequential processes, but parallel activities continuing alongside the data collection and the writing. In case study research there is often an "overlap of data analysis with data collection" (Eisenhardt 1989:538; Glaser & Strauss 1967) and similarly analysis and writing cannot be separated out as discrete activities

(Kamler & Thompson 2006:4). Rather the process is iterative, with a gradually developing understanding of the cases as each iteration builds on the one before.

Large volumes of data and CAQDAS

Because of the volume of data collected, I decided to make use of computer-assisted qualitative data analysis software (CAQDAS) to assist with the organizing and retrieval of data. I did not want to devote excessive time to software selection so I began by reading reviews of CAQDAS[1] software (Barry 1998; Fielding 1993) in order to identify the market leaders, on the assumption that they would provide the most important functionality and professional support. Based on the reviews, I downloaded and tested trial versions of Atlas.ti 5 and NVivo 7. I found both easy and intuitive to use with similar functionality. Atlas.ti is, however, more focused on visual and spatial information and supports creative, non-linear approaches to the data (Barry 1998:6.2, 6.6) and I found it somewhat more satisfying to use. I really liked being able to annotate the documents in multiple, highly visual ways – using codes, memos and adding visual links (coloured lines) between parts of the text. Atlas.ti also had a cheaper student license with no restriction on the duration of use, which made it an easy choice.

The software enabled me to store and annotate documents, including word documents, web pages, photographs and even scanned copies of hand-written notes. Documents can be grouped into families and subfamilies for easy retrieval. For example I grouped all the transcripts of interviews with supervisors. I could use this group to quickly identify all references that supervisors made to supervision contracts. Annotation can take the form of comments (memos) or of codes. I made extensive use of manual coding and some use of partially automated coding. Partially automated coding identifies all occurrences of a word (or set of words) in a selected family of documents, but gives you the choice of whether or not to code the passage. I found automated coding useful to ensure a comprehensive search of the documents. For example, I used it to locate all references to the term proposal.

The use of CAQDAS for qualitative analysis is not without controversy. Criticisms include that the analysis achieved by "slavishly following a mechanical set of procedures" may be superficial and that the software does not allow for a full range of "analytic postures" favouring grounded theory over "hermeneutic approaches, ethnomethodology,

[1] Computer-assisted qualitative data analysis software

conversation analysis or holistic analysis" (Fielding 1993; Coffey et al. 1996). Some have argued that the software imposes an orthodoxy on the analysis of qualitative data (Coffey et al. 1996). However, this view is contested by others who point out that software cannot itself "do analysis" (Lee & Fielding 1996). My particular focus in using the software was on making storage, retrieval and searching of the documents quicker, and I did not explore much of the functionality which facilitates analysis,[1] so I cannot comment with any authority on the impact of CAQDAS on analysis. But the software certainly made it possible to work efficiently with many documents, and facilitates a more comprehensive examination of the data.

Approaches to analysis

My experience confirmed the views that analysis of case study data is "one of the least developed and most difficult aspects of doing case studies" (Yin 1994:102) and that one is typically faced with a "staggering volume of data" (Eisenhardt 1989:540) and little advice on how to process it. Without being systematic, there is a risk of information-processing biases such as drawing conclusions from limited data, paying more attention to more vivid accounts or more important respondents, or ignoring evidence to the contrary (Eisenhardt 1989:540).

I began with within-case analysis (Eisenhardt 1989:539-540), working on the data for a single case study at a time. During this analysis the aim is to develop an intimate familiarity with each case study (Eisenhardt 1989:540). Several authors recommend "getting close" to the data (Glaser & Strauss 1967; Henning et al. 2004:105; Lincoln & Guba 1985; Patton 1990) and I approached this in a number of ways. Firstly, I reviewed all the interview transcripts by listening to the whole audio file and correcting minor errors in the transcript. I also made notes of where people were particularly emphatic or hesitant. Listening to the interviews gave a very immediate reminder of the tone of the interview and I frequently went back to the audio files to get clarity on what was meant.

Then I annotated the documents, making use of Henning's description of qualitative content analysis (Henning et al. 2004:104-106) to code interviews and identify possible categories for further investigation. I used fairly long, descriptive codes to capture the meaning of passages. For example codes for "Role of PhD in job" and "Role of PhD in

[1] For example, the software includes facilities to develop concepts and to relate these concepts to each other, while tracking how the concepts emerge from the data.

career" represent slightly different concepts. By using longer codes I was able to remember and identify other possible ways of interpreting the data as I went along. I often assigned two or three different codes to a passage which said more than one thing. For example a passage on the role of the supervisor[1] was coded as "role of the supervisor," "supervisor role changes" and "student independence" because it was about the role of the supervisor and how that changes as the student grows in independence.

I found that using the CAQDAS software did influence my approach to annotating the data. I wrote out descriptive codes while immersing myself in what each respondent was saying and then went back to look for duplicates and similarities and grouped codes which referred to the same idea. Once all the interviews for a case study had been coded, I made use of the "code family" feature in Atlas.ti to group codes into categories. This was useful in playing around with the data, and in seeing categories of concepts emerge.

As Henning points out, coding is an iterative process (Henning et al. 2004:105) and one that took me many months, working on one case study at a time. I wrote extensive notes about concepts and themes which I began to observe. I also made use of tables and mind maps to document categories and dimensions, such as the dimensions of the PhD experience which I discuss in chapter seven. I wrote descriptions of aspects of each case study. Such descriptive analyses "are central to the generation of insight because they help researchers to cope early in the analysis process with the often enormous volume of data" (Eisenhardt 1989:540). Some of these descriptions are used in chapter six.

Once I was familiar with each case, I did cross-case analysis comparing the results to see similarities and differences across the case studies (Eisenhardt 1989:540). Comparing the cases for similarities and differences highlighted particular themes to be explored. Such "cross-case searching tactics … force investigators to go beyond initial impressions, especially through the use of structured and diverse lenses on the data" (Eisenhardt 1989:541).

Again, things did not go according to plan. I had intended to make use of theoretical propositions to guide the analysis, matching patterns predicted by the theory to patterns observed in the case studies (Yin 1994:106). But as I worked with the case studies it became clear that the propositions I had in mind were meaningless. Rather, I found myself

[1] CMI07:144

drawn into a grounded theory approach with the focus on building explanations (Yin 1994:110) from what was emerging from the data. As concepts and the relationships between them emerged, they were tested against each case and refined (Eisenhardt 1989:542).

My supervisor played the part of a critical reviewer, assisting to identify and argue alternative explanations, particularly "those alternatives that most seriously challenge the design of the study" (Yin 1994:149). Some have argued for a "discourse of empowerment" in which the researcher and respondents work together to build meanings (Henning et al. 2004:68), but I concluded somewhat reluctantly that the participants were not interested enough in my own research to work with me on the emerging concepts.

And in all the analysis, there was ongoing writing.

> *The activity of research is one that, from the outset, involves writing. Researchers keep notes, jot down ideas, record observations, summarize readings, transcribe interviews and develop pieces of writing about specific aspects of their investigations. These writings are not simply getting things down on paper, but are making meaning and advancing understandings through these various writings. … It is through these writings that researchers produce knowledge. (Kamler & Thompson 2006:3)*

The documents which would coalesce into this thesis began to emerge right from the beginning of the study. I wrote notes about the papers I read and the ideas I had. Browsing now through the notes directory on my computer, there are titles like "thoughts about Gibbons", "seminars and professorial authority", "higher education in Africa" and "people who don't do PhDs." I used my unfolding doctoral experience to practice writing academic papers, presenting them at seminars and conferences. I wrote about the process of finding a research question (Backhouse 2006b), I wrote about early conceptions of the study (Backhouse 2006a), I wrote about the conversations I had with my colleagues about doing the PhD (Backhouse 2007b), and I wrote about parts of research as the results began to emerge (Backhouse 2007a; Backhouse 2008). In the process it became clear that writing and reading and re-writing is an indispensable part of thinking, of analysis and of theory-building (Kamler & Thompson 2006:4).

Constructing PhD stories

In trying to understand the motives of those that undertake the PhD and the understandings they have of the PhD, I made use of the *life story* approach.[1] The life story approach is both a way of collecting data (through narrative accounts of people's lives), and an approach to addressing theoretical questions in sociology, that falls within the umbrella of interpretive social research (Bertaux & Kohli 1984:217-218). Here I work with the restrictive definition of life story, meaning "narratives about one's life or relevant parts thereof" (Bertaux & Kohli 1984:216-217) rather than the broader view that includes other evidence about people's lives.

There are a wide range of ways of analyzing life story data (Bertaux & Kohli 1984:218; Peacock & Holland 1993) and here I focus on the life rather than the story (Peacock & Holland 1993:368). I am interested in both the sequence of events and the narrated account as one construction of the "subjective experience of the narrator" (Peacock & Holland 1993:369). I devised a particular approach to the analysis of the life stories of the PhD people I interviewed. I was interested in how individuals arrived at doctoral studies, why they wanted a PhD, and what their future plans were. But it was important for me to ensure that my impressions of the stories being recounted were closely related to the data and not influenced by my own inaccurate recall or focus. I had to be particularly vigilant that my own experience was not clouding my judgement, by making those stories which resonated with my own, more prominent in my mind. So I took steps to ensure that all the varied stories which I collected were given a respectful hearing and equal weight in the analysis.

In the interviews with PhD people I began by asking how they had come to be registered for a PhD in this particular time and place. This invited a discussion of their biographies while allowing each individual to recount those elements of their stories which they considered significant. I then asked questions and prompted for more detail in order to understand the chronological sequence of events and the motives and circumstances that led to major decisions and changes. In many cases further information came to light later in the interview as we both relaxed and people were willing to offer more insight into personal circumstances or to explain them in a different way.

[1] In common with Peacock, I use the term *life story* rather than *life history* because the tern history may be taken to mean that the account is true, that the events actually happened (Peacock & Holland 1993:368).

Table 3.4: Elements extracted to create short stories

1. Age and dates (including events or circumstances which indicated age)
2. Places of living, work and study and transitions to different places
3. Formal study undertaken
4. Employment and changes in employment, including the sector and type of work
5. Other sources of income or funding
6. Life events and circumstances (such as illness, marriage, children, living arrangements)
7. Reasons for doing a PhD
8. Future plans

I began by focusing on the chronological and physical aspects; where they went and when, and what prompted changes at these particular times. Each transcript was summarized by extracting all the sentences relating to age and dates (including events or circumstances which indicated age); places of living, work and study and transitions to different places; formal study undertaken; employment and changes in employment, including the sector and type of work; other sources of income or funding; life events and circumstances (such as illness, marriage, children, living arrangements); reasons for doing a PhD; and future plans. In the process I found that it was not possible to stick to this list of elements without losing some of the flavour of the individual. For example, respondent KEI03 was at pains to explain how accomplished he was, making several references to how well he had done in his previous studies. I felt that this emphasis on his achievements gave an important impression of the kind of driven and ambitious person he is, so I left in some of those elements that reflected identities.

These sentences were then edited down to a summary of less than 200 words for each interview. The limit of 200 words was chosen (somewhat arbitrarily) to make for an easily readable summary that reflected the major life events and how the PhD fitted into the story. In this process I observed the following rules: changing the order of sentences to make chronological order more apparent; removing repetitions and hesitations; removing linking descriptions; removing duplications where the same events were described more than once. This process of extracting the stories was refined with practice. Initially I tried to leave the extracted sentences in the order in which they appeared in the interview and was reluctant to make any edits that changed the original wording of the respondents, but later I reworked the order and added terms [in square brackets] for clarity. Also difficult was selecting which description of an event to include where the event had been described more than once.

Here is an example of one of the short stories which resulted from this process:

> *I had never thought I would do a PhD. I did my undergraduate in Kenya. I worked for three years, kept changing jobs. I was split between management and international relations. I did my master's at Wits in international relations because I wanted to have a feel of studying outside my country. From when I was young I used to wonder about the World Bank, the IMF - how they work, why they do what they do to African economies. I learnt about [this department] and sought admission at master's level, not a PhD; I just had my son, not as a new mother. The director called me. I had gotten a distinction in my other master's, why I didn't I do a PhD? After talking to him I sat down with my husband and that's how I ended up doing the PhD. I [am] doing consultancy work, I'm not on any scholarship. I wanted to get some experience, build my CV. After the PhD I would want to do management in an organisation that touches on governance issues. Ultimately, I would want to consult, after gathering enough experience. (WPI10)*

My goal in preparing these short stories was to make a large number of accounts brief enough to keep them visible during the analysis, while not losing the flavour of the individual interviews. I wanted to accumulate information about the events, circumstances and motivations that led people to and through PhD studies as well as information about their goals and career intentions. The process described was followed in order to ensure that I was made aware of all the relevant elements of the life stories of the interviewees and that poor recall, or an excessive focus on elements that I related to, did not skew my understanding. The full analysis of the stories that resulted forms part of chapter five.

Notes on terminology and citations

There have been two areas of complexity in the choice of terminology for this study – one anticipated and one unanticipated. Firstly, the term *doctoral programme* is not common in South Africa although for undergraduate study, and even for study at master's level, a "programme" of study is well understood.[1] I anticipated some resistance to this term and, in trying to gain access to the case study sites and in interviews with supervisors my choice of the term was raised. A typical comment was "we don't really have a PhD programme."[2] Supervisors appear to associate the term with a more structured approach, describing it as "a different sort of thing … which includes getting people doing necessary coursework"[3] and were at pains to make it clear that that was not how doctoral education was carried out.

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1 With the requirement for accreditation of programmes of study in the South African higher education system, the term has become common, however it is a term usually associated with taught courses, as evidenced by the responses of people in this study.

2 CMI09:12 also WCI05:83; WPI14:68

3 WCI05:195-199 also KEI01:129; KEI02:221; KEI08:161; KEI10:15; WEI01:78

Those who were comfortable with the term and used it themselves were often advocates of a more structured format for the PhD.[1]

The second area in which I ran into difficulty with terminology was in the naming of those people who do doctorates. The use of the term student has been criticised because it implies a "subaltern position" (Leonard 2001:79) and others have used the term "doctoral researchers" arguing that it defines "doctoral candidates in terms of their work (research)" rather than "institutional power relations" and acknowledges "the increasing diversity of ages, experience and professional status they bring to doctoral study" (Kamler & Thompson 2006:2). The use of the terms "doctoral student" or "doctoral researcher" also reveals positions on the question of whether the PhD is about training or about doing research. One of my respondents, an experienced supervisor, referred throughout her interview to *doctoral people* and when I questioned her choice of words, exclaimed, "Oh, I don't think of them as students anymore. They've very often got as much to teach me as I have to teach them."[2] Taking my cue from her, I will refer mostly to doctoral people and make use of the terms student and researcher when needed for clarity.

In reporting the research, I have tried to strike a balance between readability, thoroughness in referencing the data and accepted citation practices. When reporting what people said in the interviews I have kept to their actual words, editing out repetition and hesitation such as um, ah, er. I have not edited statements of foreigners to correct English grammar, unless I felt it necessary for clarity and then such changes are indicated with square brackets. I have used footnotes to reference material from the case studies, and for comments and asides that are intended to elucidate or expand on the text. Academic articles and other texts are cited in the text, by author and date, and full details are provided in the bibliography. While I considered putting citations in footnotes in order to improve readability, this would have made for excessive numbers of footnotes in some sections. Any inconvenience that these choices may cause the reader is regretted.

3.6 Managing the PhD process

In academia, it appears that the management baby has been thrown out with the managerialism bathwater,[3] but being a manager is very much part of my own identity. So I

1 KEI01:129; WPI14:17

2 KEI10:13

3 By which I mean that good management understandings and practices get rejected by those weary of being on the receiving end of poor management.

approached doctoral studies as a manager with two tasks to complete. The one was a research project and the other was my own learning project. And despite the odd looks that were exchanged when I lapsed into the management dialect, I drew extensively on my management experience to direct both of these.

Managing the research project

Yin says that a case study protocol "is desirable under all circumstances", but "essential if you are using a multiple case-study design" (Yin 1994:63). The case study protocol documents the research instruments and procedures and in doing so, increases the reliability of the research by ensuring that the same procedures are followed across case studies (Yin 1994:63). It should give an overview of the research, detail the procedures for site access and data collection, include the instruments to be used in data collection, specify what analysis will be carried out, and outline the reports to be produced (Yin 1994:64-74).

I produced a case study protocol, in line with Yin's guidelines, but modified it to my own ends. For example, Yin's model for a protocol is designed for a project team and includes training for the team and procedures to ensure that the members work consistently across sites. As I would be working alone in this project, these parts were not needed. But I thought that the case study protocol would be useful in planning the research and, based on my experience of project planning, I included an evaluation of risks and plans to deal with them, as well as a budget and a schedule for carrying out the research.

In retrospect, the case study protocol proved less useful than I anticipated as a guide to doing the research. In part this reflected my own inexperience in this kind of research. For example, I planned in detail how I would gain access to the sites, drafting letters to be used in approaching the sites (Yin 1994:67), but I found that gaining access to the different sites was so varied, that these aspects of the protocol could not be used. I also found that outlining the reports as Yin advocated (Yin 1994:73-74) was not particularly helpful in the context of the PhD. The research report for the PhD is the thesis, and I found it impossible to anticipate the format of this thesis at the time when I wrote the protocol.

On the other hand, completing the protocol was a useful exercise, in that it made me think through all the aspects of the project before I started. Having a detailed plan made it possible for me to identify where the plan was going wrong and take corrective action. For example, the original plan underestimated the time it would take to transcribe the interviews. When I noticed this, I made arrangements to pay transcribers in order to ensure

that the project would complete within the three year timeframe. Reflecting back on the extent to which the project followed my plans and where it did not is also a useful way to improve my management of research projects. For example, I underestimated the time it would take to analyse the data and I had no sense of the time required for findings to emerge from the data. In future projects I would adjust the plans accordingly.

In particular the protocol was useful in planning the resources that I would need and the funding for the project. Like many of the people that I interviewed, I was responsible to fund my own research project and I had to be creative about finding resources. The university provided me with an office, a computer, a telephone for local calls and photocopying facilities. Equipment of my own that I used for the project included a digital voice recorder, desktop computer, external hard drive for backups, notebook computer for use while traveling, memory stick and a cellular phone for non-local calls and internet connectivity while traveling. I was able to borrow a digital camera. Direct costs which I incurred include the purchase of EndNote and Atlas.ti software, stationery and computer consumables like CDs.

In order to keep travel and accommodation costs down, I chose two case studies at my local university, I made use of accumulated air-miles to fund flights and I arranged cheap accommodation through family. I tried to combine one site visit with a conference, in order to benefit from a university travel grant (available to postgraduates who are presenting at conferences), but found that the cost of the conference far outweighed the travel grant. The total direct cost of the research project was R29 402 (see Appendix C), with the biggest part being for transcription (R11 500). I've recorded the costs because I could not find information about the cost of postgraduate research and I think the information could be helpful to other postgraduates. I was fortunate to be doing my research later in life when I had accumulated equipment, was in a financially stable position and could draw on resources like accumulated air-miles to reduce costs. Had I not been, the project would have cost considerably more and I probably would not have included the remote sites.

This research project lasted three years, involved five academic departments (four cases and the one I studied in), at three different universities in three different cities, and involved over 70 people. A project on this scale necessitates significant management, but in the course of this research I found no evidence to suggest that skills in managing large,

long-term research projects are taught during the PhD. It is doubtful that this project could have run as smoothly, had I undertaken it without prior experience in project management.

Managing my learning experience

In *Fire Upon the Deep*, science fiction author Vernor Vinge posits a pack species, similar to a pack of dogs, that share a single pack-mind and a common set of memories. They communicate by "mind noise" and when a "singleton" is separated from the pack, no longer able to hear the thoughts of the others, the ensuing silence induces "isolation panic."[1] This is the best description I can find of the experience of moving from the team-work environment of the IT industry to the independent work of doctoral studies. I was accustomed to working with other people, to developing ideas collaboratively and to having people to rely on who could complement my strengths and compensate for my weaknesses. Suddenly I was required to be alone for long periods of time, to develop ideas without any discussion and to rely entirely on my own range of skills and aptitudes. The isolation was debilitating and painful. That this experience is common among those doing PhDs in education (Chiang 2003), made it no less painful.

In addition I was a recent immigrant to the social sciences and barely spoke the language. My first experiences of departmental seminars and a doctoral summer school, left me silenced by the foreign language and social customs in a way that I had never before experienced, and dealt a blow to my self-esteem and self-image. It took more than a year to rebuild my confidence. In part I was learning the discourse and customs, but in part I drew on my past experience to deliberately build social networks that would provide the support and affirmation that I needed.

It was difficult to participate in the academic life of the department. I had decided not to get involved in any teaching work because I had left a senior lecturer position in order to study full-time and teaching would have negated the opportunity. But I was keen to participate in the weekly staff research seminars. During the first year of my enrolment I campaigned to have doctoral people included in the mailing list that announced these seminars, but to no avail. Despite assurances that it would be done, there appeared to be a strong separation between staff and students that made it impossible, and to this day, doctoral people do not get these invitations. The perception to me as a PhD person, was that we were not welcome, but I suspect that the reality lay in the complexity of the e-mail

[1] (Vinge 1992:361)

systems. I was, however, able to get onto a university mailing list on which some of these seminars were announced and attended those that were.

I worked on a large national research project commissioned by the Council on Higher Education and involving three universities. While this project added considerably to my workload, particularly in the first year of my studies, it gave me contact with a research team, gave me the opportunity to observe and participate in managing a much larger project and gave me the opportunity to observe senior researchers designing the project and analyzing the results. This exposure to a second research project in the process of completing my own gave me a richer understanding of research.

There were also doctoral seminars within the department, in the faculty graduate school and offered by the university-wide postgraduate office. I also attended and presented at conferences locally and abroad and I participated in a reading group with others who were working in the same area. I volunteered to represent the postgraduates on a faculty working group to revise administrative procedures. I used the fact the I had previously been on the staff of the university and my knowledge of how the university operated, to worm my way into staff training in research writing, in supervision and in thinking styles and these courses enabled me to expand my network to academic staff in other parts of the university. One of these contacts lead to my gaining access to the third of my case study sites.

Over time I built up a network of people across the university that I could draw on in different ways – for a cup of coffee or lunch, to chat about progress or the emotional ups and downs, to share journal articles and books, to read drafts of papers and thesis chapters or to share opportunities for conferences or funds. This social network provided resources and motivation and emotional support.

3.7 Conclusions

This study, a PhD about PhDs, continues my long fascination with self-referential things. And this chapter has been dominated by the story of my own PhD, while also elucidating how this study was carried out. I began by establishing my epistemological stance as a critical realist and my perspective of education as a complex adaptive system. I explain that these positions mean that I will be building theory, in the sense of descriptions and explanations for doctoral education, rather than in the sense of laws and predictive relationships.

I went on to justify my choice of a case study approach as appropriate for investigating the complex social nature of doctoral education. And I explained my choice of a multiple-case design using four case studies in line with Becher's categorization of disciplines. My cases focus on the English-speaking, historically advantaged universities in South Africa and so this study does not reflect the full range of doctoral education in South Africa. Next I discussed in detail the evidence on which this study is based and how the data was collected and organised. It highlighted how the "messy field of practice" (Schön 1983) interferes with idealistic notions of how research ought to be done. I discussed how I went about analysing the data, and in particular described how I used the interviews to extract *short stories* of individual doctoral people in order to keep visible the wide variety of doctoral experiences.

This is not objective research and I am too passionate about the subject to stand at a distance. At the risk of upsetting an examiner, I am with Richardson (Richardson 2002:41) when she says that "we are always present in our texts, no matter how we try to suppress ourselves." I hope, however, that this chapter has established that I have taken reasonable steps to ensure that the research is rigorous, to the extent that rigour is possible. I beg the reader's indulgence if I have been more present in this chapter than expected. The narrator has said enough at this point and it is time for the real drama to begin. In the next chapter, I begin to examine the PhD itself, asking what it is, and what it is for. And first significant actors, the supervisors, make themselves heard.

Chapter Four

WHAT IS A PHD?

South African understandings of doctoral education

4.1 Introduction

The doctorate originated in medieval Europe as a license to teach, granted by the church to one who had completed a programme of higher study. As I explored in chapter two, it entitled one to be called *doctor* and to teach in the loosely-coupled organization known as the university. As research became more important in universities during the eighteenth and nineteenth centuries, the PhD emerged as a degree that certified one's competence in doing research. But the focus differed across geographical regions. For example, the North American universities focused on the PhD as training for research, while in Britain it was considered to be evidence of having done substantial research.[1] The South African higher education system followed the British tradition and established the PhD as a degree in which one carries out research, with research training being provided at master's level. Current debates about how best to effect doctoral education, lead to questions about the purpose of doctoral education, with different discourses emerging. In this chapter, I examine the understandings of the purpose and expectations of doctoral education which dominate in the South African context.

The question "What is a PhD?" can be investigated by asking, "What are the essential characteristics of a PhD?" and "What makes it different from other degrees?" But it can also be investigated by asking, "What is the purpose or goal of the PhD?" Different understandings of the goals give rise to different characterizations of the PhD. In a complex adaptive system, there may be multiple goals operating at once (Axelrod & Cohen 2000:120-122), so that we find supervisors who consider knowledge generation to be the goal of doctoral education, but we also find national planning bodies which are concerned with producing high level skills. There is a further distinction between the immediate objectives of the system and the larger goals which inform people's understandings. For example, those who view the PhD as doing research, might be pursuing the larger goal of expanding human knowledge, while for national planning bodies the larger goal might be economic growth. So in understanding what the PhD is, I examine not

[1] See for example, Blume 1995: 11 and Sadlak 2004: 262.

only its characteristics, but also the range of immediate objectives and larger goals expressed by different role-players.

I start in section 4.2, by examining the ways in which the doctorate is understood in the literature. While this section revisits some of the literature discussed in chapter 2, the focus is different. Chapter 2 was concerned with setting the scene; providing the backdrop against which this discussion takes place. Here I am concerned with a closer reading of what that literature has to say about the purpose and goals of the PhD. In section 4.3, I examine the views expressed in policy and other documents at a national and institutional level. In section 4.4, I consider the views expressed by PhD supervisors in the four case studies. From these discussions I identify three perspectives on doctoral education which are elaborated in section 4.5.

4.2 Understandings from the literature

Understandings of the purpose of doctoral studies and the goals of doctoral programmes have long been debated. In 1987 in the UK, the Winfield Report found that there was no "unequivocal and widespread agreement" on the nature, form and purpose of the doctoral degree (Winfield 1987:11), and twenty years later, Park is calling for a "sector-wide debate on the nature of the doctorate in the UK" (Park 2007:36). The literature on doctoral education which emerged between these two reports, reflects different and changing understandings of the purpose of doctoral studies. There are two traditional views of the purpose of the PhD. The first considers the doctorate to be contributing significant new knowledge to a discipline (Leonard 2001:60; Mouton 2001:5) while the second considers it to be a process which results in a scholar (Boote & Beile 2005; Eisenhart & De Haan 2005; Kamper 2004). These two can be distinguished as a focus on the product or a focus on the person.[1] Different disciplines emphasise one or the other. For example, mathematics emphasizes the knowledge produced while literary criticism emphasises the person (Moore & Maton 2001).

As concerns grew in the 1980s about the long duration and high drop-out rates in doctoral studies, the view of the PhD as preparation for a research career emerged alongside traditional views of the PhD (Leonard 2001:22-23). Gradually the PhD came to include more formal training in research with a focus on preparing people for a career as an independent researcher rather than as a scholar in an academic community (Chiang 2003:6). The Bologna process, for example, advocates the addition of research training courses to doctoral degrees and tracks the

[1] Purpose of the doctorate, The Oxford Learning Institute. http://www.learning.ox.ac.uk/rsv.php?page=326 accessed 15 November 2008. Also (Park 2007:199).

progress of this by country (Bologna Working Group on Qualifications Frameworks 2005:19). Objections have been raised that a greater emphasis on "transferable research skills" lowers quality and shifts responsibility for doctoral education away from professors and towards institutions in violation of traditional notions of academic freedom and authority (Blume 1995:36). But the shift towards research training has gained momentum globally and is a common theme in the literature (Blume 1995; Cloete & Galant 2005; Heen 2002:85; King & Dobson 2003; Van der Westhuizen & De Wett 2002).

Over time the research training discourse widened to consider training towards other careers. Writing in 1995, Blume noted policy shifts in several countries towards viewing the PhD as preparation for careers outside of the academy (Blume 1995:30-31). But these shifts were *not* driven by a greater demand from employers outside of academia, who often viewed the PhD as too academic (Blume 1995:30). Rather the need for more PhDs in industry was identified at a policy level and accompanied by suggestions that "initiatives designed to influence employers' perceptions of the utility of doctoral training are needed" (Blume 1995:30). There has also been increasing focus on the PhD as preparation for an academic career, with suggestions that people should have exposure to teaching and other aspects of academic practice[1] during the PhD (Bakradze et al. 2005; Eisenhart & De Haan 2005:10). Consequently, much of the literature now considers the doctorate to be preparation for a career – either in academia, research or elsewhere (Bakradze et al. 2005; Golde & Dore 2001; Heen 2002).

There is a global trend towards viewing higher education in terms of human capital (Barnacle 2005b:84) and doctoral education is often examined in terms of national or global labour needs (Golde & Dore 2001; Heen 2002; Sadlak 2004). For example in the USA, where the academic job market is shrinking and unable to absorb the large number of doctoral graduates (Golde & Dore 2001:2), there have been calls for doctoral programmes to be broadened and to include internships and career guidance for those seeking jobs outside of academia (Golde & Dore 2001:19). Hirsh argues against using a labour market approach in evaluating the need for doctoral graduates on the grounds that the academic labour market is highly sensitive to short term policy fluctuations and that demand for doctoral graduates outside of academia is little understood (Hirsh 1982:195-196). More recently Donoghue has critiqued the labour market arguments which have been applied to the employment of humanities PhDs in the USA

[1] I use the term 'academic practice' in the sense of McAlpine and Hopwood to include forms of inquiry, forms of teaching and forms of citizenship or service. McAlpine, L., & Hopwood, N. (2007). Statement on academic practice. Retrieved 5 March 2008, from http://www.learning.ox.ac.uk/files/AP%20document.pdf.

(Donoghue 2008:34). Viewing doctoral programmes from the perspective of national labour needs leads to a focus on the efficient use of resources to provide skilled labour, measured by performance indicators and good education becomes equated with meeting targets (Barnacle 2005b:84).

In different parts of the world different understandings of the doctorate dominate. For example, the European tradition emphasises the contribution to knowledge (Chiang 2003:5; Reichert 2005:1) and the doctoral degree in Europe "was not conceived as a training in research, but as research itself" (Blume 1995:11). In the USA, despite a great diversity of doctoral programmes (Sadlak 2004:261), the focus is more clearly on research training and the PhD's "primary purpose is teaching junior scholars to conduct sound, rigorous research" (Golde & Dore 2001:5) in preparation for a research career: "traditionally, the doctorate was the quintessential research degree, aimed at preparing students for a career in academic research, or in some fields, applied research" (Sadlak 2004:262).

In the South African literature concerns for redress and development dominate[1] and there has been less overt debate about the purpose of the PhD. Explicit statements reflect a consensus that during the PhD one undertakes research to generate knowledge (Dietz et al. 2006:9; Mouton 2001:xi). But some of the literature reflects the assumption that the PhD is research training (Glencross & Mji 2001; Machel 2006; Motala 1991) and the human capital discourse is present in writings that address social and economic development (Cloete & Galant 2005; Koen 2003; Kraak & Press 2007; Smit 1989). The more significant debate in the South African context is around access to doctoral education – the extent to which research degrees have been mystified and as a result exclusionary; and pedagogies which facilitate access (Christiansen & Slammert 2005; Cloete & Galant 2005; Lues & Lategan 2006; Ogude et al. 2003; Samuel 2000).

The other debate is around the kinds of knowledge which are to result from the PhD, reflecting a concern with generating knowledge that will address local problems. Research training programmes have had a strong focus on research for liberation or at least for development (Jansen et al. 2004; Kamper 2004; Motala 1991; Robinson & Meerkotter 2003) and among doctoral people there is a "misconception that the research was intended to *change* a social phenomenon" which leads them to ask "questions imbued with missionary zeal, aiming to make the world a better place" (Jansen et al. 2004:88, emphasis in original). There have been calls for

[1] See chapter one.

"national educational research priorities" which are "endorsed by all educational researchers, including master's and doctoral students" (Kamper 2004:233-234). And a model has been proposed for engagement between universities and the community that ensures results for the community as well as internal control of definitions of research for the university (Pretorius 2003:78). There have also been words of caution, that there is a limit to what impact research can have, "the science and technology system … will obviously not be able to empower the poor in society or redress the injustices of the past" (Garbers 1996a:69).

Despite ongoing debate and change, traditional views of the PhD as knowledge generation and the development of a scholar endure. Reichert, reporting for the Bologna Secretariat, the results of a session on doctoral education says that there was…

> *…wide agreement on the values that should underpin doctoral training, namely that doctoral training should serve the advancement of knowledge through original research, should be based on academic freedom and, increasingly, that it would be desirable that such research would contribute, in the long term to the economic and social advancement of humanity. (Reichert 2005:1)*

And the academic perspective of the PhD is being re-asserted with a focus on the traditions of scholarship. In the USA the idea has emerged that the PhD should prepare people to be "stewards of the discipline" (Golde & Walker 2006) with the term steward being selected to convey a larger sense of purpose and to engage academics in the debate because, for them, "big ideas are more compelling and more persuasive" (Golde 2006:8). Here we find a description that is strongly reminiscent of the focus on scholarship and knowledge generation which accompanied the rise to prominence of the PhD in nineteenth-century Germany.[1]

> *We propose that the purpose of doctoral education, taken broadly, is to educate and prepare those to whom we can entrust the vigor, quality, and integrity of the field. This person is a scholar first and foremost, in the fullest sense of the term – someone who will creatively generate new knowledge, critically conserve valuable and useful ideas, and responsibly transform those understandings through writing, teaching, and application. We call such a person a "steward of the discipline."(Golde 2006:5)*

[1] See chapter two.

4.3 Views of policy-makers and administrators

There are a number of different stakeholders with an interest in the conduct and outcome of doctoral degree programmes, including those who do PhDs, academics, institutional leaders, national governments, agencies and advisory bodies, business and industry (de Boer et al. 2002:11). Research into doctoral education began in response to administrative concerns about the high cost and poor completion rates of doctoral education, so that much of the discourse around doctoral education originates in and continues to reflect the understandings of national planners and institutional administrators. In this section I focus on these perspectives. I start by examining the assumptions that are being made about the nature of the PhD in significant national policy documents for higher education and for research and development. Then I look at the views that are reflected in institutional policies and procedures.

What key national policies say about doctoral education

Higher education in South Africa is governed by a central ministry for education. While institutions have significant autonomy, their actions are governed by central controls on funding and the accreditation of programmes. The National Qualifications Framework (NQF) introduced in the late 1990s[1] requires qualifications, including doctoral degrees, to be registered and to comply with the requirements laid down by the Higher Education Quality Committee (HEQC); the body constituted to oversee the quality of higher education programmes. But doctoral degrees, being concerned with research, are also the concern of the Department of Science and Technology which is responsible for policy and the ongoing support of national research. Here I examine key national policies from these two ministries.

Published in 1997, the *Education White Paper 3: A programme for higher education transformation* set the agenda for higher education for the last decade. It defined the purpose of higher education, noting that "the production, advancement and dissemination of knowledge and the development of high-level human resources are core functions of the higher education system" (DoE 1997:31). Increasing enrolment at the master's and doctoral levels is necessary "to address the high-level skills necessary for social and economic development and to provide for the needs of the academic labour market" (DoE 1997:21) and the "general labour markets" (DoE 1997:54). There are concerns about "the attrition and ageing of well-qualified academic staff"; the "emigration of graduate labour"; the "low levels of enrolment in and graduation from doctoral programs"; and "gross race and gender inequalities" (DoE 1997:54). There is also

[1] For details, refer to (Allais 2007).

"insufficient research capacity in higher education, and existing capacity is poorly coordinated and not adequately linked to postgraduate studies" (DoE 1997:31). Postgraduates programmes are needed for "capacity building" and form part of a "human resource development plan for higher education" (DoE 1997:33).

However, the White Paper 3 has little specific to say about doctoral education. As is the case with most policy documents, there is no distinction between master's and doctoral level programmes. The goal of both is to develop academic and research staff.

As to how postgraduate education is to be tackled, the "dissemination of knowledge through teaching and collaboration in research tasks are the principal tools for developing academic and research staff through postgraduate study and training" (DoE 1997:31). Funding of postgraduate education is to be based on a policy of "concentration and selectivity." Under this policy funds will be made available "in those parts of institutions (historically advantaged and historically disadvantaged alike) where there is demonstrable strength" and will depend on "performance indicators of research capacity, competitive success and output by faculty." But funds will also be made available to support the development of "new institutional centres for postgraduate training" where this can be justified by "clear evidence of potential for success" (DoE 1997:49-50).

The White Paper 3 also supports the development of a national research plan which would…

> … *identify national priorities for research and postgraduate training, processes for the identification and establishment of centres of excellence and niche areas, targets and performance indicators to achieve redress by developing a more representative research community, and incentives for collaboration and partnerships, especially at the regional level, in research and postgraduate training. (DoE 1997:32).*

The Council on Higher Education (CHE) is responsible for informing the ministry of "the research capacity and performance of the system, including postgraduate training and research infrastructure and ways of developing research strength in historically disadvantaged institutions" (DoE 1997:39). There is a hint that it might be desirable to attract foreigners into postgraduate programmes in the statement that "mobility of students nationally and internationally to undertake postgraduate studies is an important means of adding to the skills base" (DoE 1997:54).

The *National Plan for Higher Education*, published in 2001 seeks to implement the vision of the White Paper 3 and similar views of doctoral education are expressed. Priorities are "to increase the number of master's and doctoral graduates"; "to sustain existing research capabilities and strengths"; and "to facilitate collaboration and partnerships in research and postgraduate training" (CHE 2000:60). Low enrolments in master's and doctoral programmes are attributed to the lack of financial support, the fact that these degrees are not valued for non-academic work and the unattractiveness of academic careers (DoE 2001:63). Again, the PhD is considered no different to the master's degree; they both develop research skills and generic skills required for work as an academic, or in other capacities.

The plan says nothing about how doctoral education is to be effected. It commits to greater funding for postgraduate people and it sets goals to lower drop-out rates and speed up completion (DoE 2001:65). A target 20% graduation rate is set for doctoral programmes and financial incentives are provided for institutions to meet this target (DoE 2001:20). The plan notes that six of the country's universities produce 70% of the master's and doctoral graduates and the demographic profile of these graduates is skewed. But it also acknowledges that research capacity and infrastructure is built over a long time and depends on "the development of an academic environment and culture that is conducive to, and actively promotes, research" (DoE 2001:62). This might appear to support the idea of the PhD as a process of academic enculturation.

The Department of Science and Technology published the *South African National Research and Development strategy* in 2002. About one third of this document is devoted to the question of developing human resources in a market model of supply and demand for skills (DST 2002:23). There is a concern to increase the number of people with skills in science, engineering and technology and to right the skewed racial and gender profile of this skills base. The strategy names the National Research Foundation (NRF) as the "key institution" that will effect this increase in line with the National Plan for Higher Education (DST 2002:16).

Once again, doctoral education does not feature explicitly in the strategy. Rather the focus is on improving high-school education and how to "draw young people towards careers in scientific research" (DST 2002:23). There is some discussion of postgraduate study, but again no distinction is made between the doctoral level and other postgraduate study, implying that the PhD is not regarded as significantly different from other postgraduate degrees. The number of postgraduate degrees in science and technology subjects is considered to be an indicator of

future research and development capacity, but not of current R&D capacity (DST 2002:27). This suggests that doctoral people are in training for research careers rather than engaged in doing research – a view reinforced by the fact that doctoral theses are not included in measures of institutional research output.[1] Another third of the strategy document is devoted to the question of innovation, defined as "the introduction into a market (economic or social) of new or improved products and services" (DST 2002:19). Given that the PhD is awarded for "original research" one might expect a connection to be made between innovation and doctoral education, but this is not the case.

The strategy sends mixed messages about the kinds of knowledge to be pursued. Firstly it assumes that developing science and technology will foster economic growth and alleviate social problems such as poverty (DST 2002:42). Then it suggests that socially relevant research is what young researchers will want to pursue: "We believe our ability to attract young people to careers in science and technology will depend on our adoption of new technology mission that are, designed for a democratic, inclusive South Africa" (DST 2002:56). But while conceding that "the motivations of individual scientists are generally fired by intellectual curiosity" it emphasizes the need to prioritize what research will be funded "in terms of likely outcomes" (DST 2002:54). Elsewhere it suggests that requiring closer connection between higher education and the human capital market "drives the academic system towards short-term, incremental problem solving" (DST 2002:35) and that this is to be avoided.

While there is no discussion of a strategic role for the PhD in national research and development, there are a few statements that might reflect on operational aspects of doctoral education. The only explicit mention of the PhD is a reference to the trend in some countries for research degrees to be examined on the basis of published papers rather than the thesis, which seems to imply that such an approach to examination would better support "the advancement of science" (DST 2002:57-58). A discussion of the need for greater collaboration globally and across Africa, mentions the need for postgraduates to participate in such collaborations (DST 2002:59), apparently supporting the development of sandwich and exchange arrangements for postgraduate study. And there is a clear message to universities "to retain productive science and engineering educators and mentors in tertiary education, provided that they attract and develop young black and female students into postgraduate research" (DST 2002:56).

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[1] Policy and procedures for measurement of research output of public higher education institutions, Ministry of Education, 2003

The National Research Foundation, supported by the Department of Science and Technology, recently launched the South African PhD Project. The project seeks to increase the number of PhD graduates in South Africa in order to "address the local human capital requirements" because the current production of PhDs is "way below the number of doctoral graduates required to support a competitive knowledge-based economy" and "PhD graduates can contribute to all sectors of the economy beyond the academic and research related areas" (NRF 2008).

National policy makers are concerned with addressing a human resource problem and view the PhD as developing high-level skills, particularly in research. They make no distinction between doctoral and master's level education. Both develop research and generic skills that are useful for economic and social development. The goal of doctoral education is to produce highly skilled graduates who will find employment in higher education, in research positions and in the general labour market. Policy assumes that more of these graduates will benefit the economy and society, and lead to development.

Policy is largely (and perhaps appropriately) silent on the question of how doctoral education should take place. Research skills are to be developed through teaching and collaboration in research tasks (DoE 1997:39). This apparently allows for both the "learning by doing" model where the focus is on conducting research, and the "research training" model where the focus is on training. But this inclusiveness might be a consequence of the lack of any clear distinction between doctoral and master's programmes. There is also considerable ambivalence about the kinds of knowledge to be pursued. While acknowledging the need for strategic research and that driven by curiosity, there are concerns that research should benefit the developing economy and that funding be dependent on outcomes.

Only very recently do we see any engagement with what the PhD should be. The new Higher Education Qualifications Framework (HEQF), published in October 2007 and scheduled for implementation on 1 January 2009, defines the PhD as a level 10 qualification – the "highest qualification awarded within this framework" (DoE 2007:29). The PhD is a research degree, the goal of which is "to demonstrate high-level research capability and make a significant and original academic contribution at the frontiers of a discipline or field" (DoE 2007:29); while the master's degree is to "educate and train researchers" or to "prepare graduates for advanced and specialised professional employment" (DoE 2007:27). This distinction makes it clear that at the master's level one is *trained to do research* while at the doctoral level one *does research*.

The HEQF is the first document that positions the PhD in this way and is also the first to address doctoral education as distinct from postgraduate education. The lack of distinction between master's and doctoral programmes in policy documents before 2007 might be interpreted as a failure to appreciate the distinctive nature of the PhD, or to reduce it to research training in the manner of master's degrees. However, it is more likely that the ministries simply had more pressing matters to attend to and lacked the capacity to address postgraduate education in more detail until recently.

What universities say about doctoral education

Within universities, there is more clarity about the nature of the PhD. A supervisor says that, "we've got the standing orders on PhDs, but it doesn't actually say what a PhD is."[1] However, documents from the three universities included in this study make it clear that the PhD is *a research degree* during which one *does research*.

The postgraduate handbook for the Faculty of Engineering and the Built Environment at the University of the Witwatersrand (Wits) spells out the requirements for the PhD:

> *At the close of the period for research and after consultation with the appointed supervisor, a candidate will be expected to submit, with the supervisor's approval, a thesis for examination. The thesis must constitute a substantial contribution to the advancement of knowledge in the subject chosen and must be satisfactory as regards literary style and presentation. (Wits 2008b:5)*

This clearly positions the PhD as a research degree. There is a "period for research" rather than for training or development, and the result is a "substantial contribution to the advancement of knowledge." The view is echoed by the General Rules for the PhD at the University of Cape Town (UCT), which state that "the degree of Doctor of Philosophy is a research degree" (UCT 2008a:1). In the Faculty of Humanities, Development and Social Sciences at the University of Kwa-Zulu-Natal (UKZN), "doctoral degrees are attainable only by *research dissertation*" (UKZN 2007a:18, emphasis in original). At UCT there is some suggestion that the PhD might include advanced study. The General Rules state that in the process of obtaining the degree, "a candidate shall undertake research, and such advanced study as may be required" (UCT 2008a:2).

[1] WPI14:96

The position of the PhD as research is reinforced by its inclusion in university research polices and strategies. At Wits, the Strategic Research Plan mentions the need to develop "younger and previously disadvantaged groups of researchers" (Wits 2007:4), the need to "increase the average number of academic staff with a PhD" (Wits 2007:5) and the need to increase postgraduate student numbers (Wits 2007:9). The plan seeks to "encourage academics and postgraduates to work at the frontiers of their disciplines" (Wits 2007:5) and makes mention of a number of other "postgraduate initiatives" (Wits 2007:8). At UCT, awards made to doctoral students are reported in the annual research reports (UCT 2007). And UKZN has developed seven research policies, one of which (research policy 5) is devoted to the subject of postgraduate research (UKZN 2005:5).

So from the perspective of the institutions, the PhD is characterised by doing research and developing research skills in the process. The goal is to advance knowledge and to enable university staff to work at the frontiers of knowledge.

4.4 Views of supervisors

The academic staff who supervise PhDs are in a unique position to comment on what the PhD is. Not only do they play a primary role in doctoral education, they have themselves completed doctorates and have experienced the learning and knowledge generation which they seek to bring about. They also have insight into the role which the PhD plays in academia. In this section I examine the views which supervisors express of the PhD.

In supervisors' responses I found four dominant characterisations of the PhD. Firstly and most consistently, they view the PhD as *doing research to generate knowledge.* Then, they express the idea that the PhD *results in a certain kind of person,* one that is independent and has a characteristic way of thinking. Many supervisors believe that the PhD *prepares one for an academic career* although views differ on whether the focus should be wider than research. And finally, a number of supervisors see the PhD as part of the *ongoing personal and professional development* of people who are not necessarily academics. This view is more prevalent in some disciplines than in others.

Doing research to generate academic knowledge

Supervisors consider the PhD to be doing research to generate knowledge.[1] The PhD "needs to break new ground"[1] or it has to "advance knowledge – either theoretically or empirically."[2] They

[1] CMI03:52,116; CMI12:191; CMI15:67; CMI17:168; CMI18:89; CMI19:59; CMI20:127; CMI22:131; KEI01:33; KEI13:65; WCI05:55; WCI09:91; WPI05:79; WPI14:27

say that, "essential to a PhD is that students should produce something new"[3] or original.[4] Less frequently they suggest that the work should be creative[5] or innovative.[6] But their focus is subtly different from the institution's concern with "doing research." For supervisors, the knowledge generated is the end, and doing research is the means to that end. By contrast the institutions see doing research as the end.

Depending on the discipline, originality takes different forms.[7] In mathematics, one has to produce "results" – a term used ubiquitously by mathematics supervisors.[8] Mathematical results include defining new mathematical objects, proving theorems about their properties and constructing examples of such objects, or constructing new or improved mathematical models and relating them to empirical data. In English studies originality might include "bringing to the fore a certain body of work which has been neglected" or "to try and map a field … which hadn't been given any coherence before" or "conceptualizing something that has been there, but is not seen as a whole."[9] Civil and environmental engineers are expected to investigate new ways to solve engineering and environmental problems.[10] In public management, people review and critique policy and policy implementation.[11]

A PhD should generate a particular kind of knowledge, characterised as academic or theoretical.[12] The knowledge produced has to "conform to academic standards,"[13] it requires a "theoretical framework"[14] and it must be "something that advances the theory"[15] even if it is to a small degree, as this supervisor explains:

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1 KEI13:65
2 WPI14:27
3 CMI10:59
4 CMI10:23,43,59; CMI18:89; CMI19:59; CMI20:127,139,207; CMI23:93; KEI01:33,37-41; KEI02:121; KEI05:38,42,48,110; KEI08:145-147; KEI09:201; WCI05:59; WCI09:91,259; WPI04:191; WPI05:35
5 CMI03:116; WCI09:91,179; WPI05:35
6 KEI09:163,167; KEI13:65; WPI05:35
7 See chapter eight for a detailed analysis of the research produced in the four disciplines.
8 CMI03:92,120,138; CMI09:36,72,84,104,156,168; CMI10:195; CMI15:71,393; CMI17:168; CMI19:35; CMI22:139,219
9 KEI08:143-145
10 WCD18
11 WPD24; WPI01:200; WPI10:73; WPI11:34; WPI08:81; WPD25:1; WPI03:139
12 WPI04:69; WPI09:161; WPI14:25
13 WPI04:61
14 WPI09:75
15 WPI14:27

> *A PhD should push the theory, but if it doesn't, it doesn't mean that it can't be a good PhD. If it can push the theory then that's great, even if it's just a slight pushing, to say, "Well, organisational change theory actually just doesn't work in these kind of contexts, and so this existing body of knowledge is really not applicable in developing countries." I mean that's a very slight pushing of the theory. And then you can say … it's contributed to new knowledge. … The next best thing would be to add, "Well, if it doesn't do that, then here's the alternative." (WPI14:84)*

This does not mean that PhD research should not be applicable. One supervisor describes it as "a mixture of academic and applied knowledge"[1] and an applied mathematician says, "When theorems start applying … I'm able to tell whether they are worthwhile or not."[2] But there needs to be a scholarly appreciation of theory. A supervisor says of a thesis that was "sent back for major revisions" that "it lacked that whole scholarship issue, which is always ambiguous and is never explained … what it really meant was that the student hadn't thought through the theoretical components and he had come from one particular viewpoint."[3] What constitutes academic or theoretical knowledge differs across disciplines and will be addressed in more detail in chapter eight where I examine the knowledge produced in each case study.

The PhD has been associated with developing specialist, disciplinary knowledge (Becher & Trowler 2001:134-135), but doctoral research increasingly crosses disciplines. I encountered people whose PhDs crossed architecture and engineering;[4] engineering and physiology;[5] biological sciences and mathematics;[6] cultural studies, musicology and translation;[7] ecology and engineering;[8] ecology and mathematics;[9] economics, finance and mathematics;[10] education and mathematics;[11] and history and literature.[12] Supervisors find this kind of work exciting[13] and they themselves research and supervise across faculties.[14] I encountered only one who had explicit difficulties with cross-disciplinary work. He described himself as "an economist" who

1 WPI05:31 also CMI22:139; WPI09:75
2 CMI09:100
3 WPI04:93
4 WCT02:67
5 WCD18
6 CMT19:19; CMT07:63
7 KET02:28-30
8 WCT03:19
9 CMT14:23
10 CMT20:122
11 CMT23:31
12 KET03:163
13 KEI05:48
14 CMI22:07; WCI05:19

approaches life "from a theoretical perspective of economics" and was concerned that introducing people to theories from other disciplines would confuse them.[1]

A number of supervisors distinguish the PhD by its scope and the amount of work it entails. It is a larger, more significant work than a master's degree[2] and it covers more ground: "the amount of reading – with a PhD they have to read widely."[3] But some cautioned that the scope needs to be manageable: "the PhD is also a stepping stone, it's not a life's work."[4] So that while one supervisor says that the PhD "should be this great leap that you have to make, because it is original research"[5] other (more experienced) supervisors are less ambitious saying, "it's not likely that you'll get a set of new ideas – I mean, that's high-level stuff – to be able to change a paradigm"[6] and that "I don't think one needs to be that demanding about the quality … obviously it shouldn't be trivial, but one doesn't expect something profound from an average PhD student."[7]

Doing research requires familiarity with the research methods of the discipline[8] and during the PhD one might develop, expand and adapt research methods. Sometimes this process of developing research techniques is the contribution which is made, "it's not just about the content but about the process of doing research and that process becomes part of the knowledge contribution. It contributes to knowledge about how research is done."[9]

In all of the case studies, a master's in a related field is a prerequisite for doctoral studies and it is assumed that people come to the PhD having already developed research skills and disciplinary expertise during their master's: "it is assumed that they have done that."[10] Supervisors acknowledge that research skills continue to develop through the course of the doctorate,[11] but at the PhD level, people are expected to learn by doing rather than by being taught[12] and research skills are a byproduct of the process of doing research. The exception was public management where people come to PhD studies from other fields or from careers, so that their

1 WPI09:161-163
2 CMI15:67; KEI01:33; WCI05:59; WCI09:91; WPI05:34
3 WPI04:77 also KEI13:65
4 KEI08:53,153
5 KEI05:38
6 KEI08:147
7 CMI10:59
8 WPI04:33
9 WPI05:61
10 WCI09:167 also CMI19:259
11 CMI18:31; CMI22:163; KEI01:129; KEI09:59; KEI13:41; WCI05:55
12 CMI03:52; CMI15:131; CMI23:93; WPI05:79

master's degrees may not be in a closely related field and may have been completed many years before.[1] Supervisors say that these people need an orientation to academic knowledge and appropriate research methods before they embark on their research.[2]

Supervisors identify two consequences of viewing the PhD as knowledge generation. For a start, it is necessary to have a genuine interest in the field and to want to add to the body of knowledge. Supervisors say that their supervisees "are doing PhDs because they are really interested in advancing knowledge"[3] and "occasionally we do get people who love the subject so much that they want to do a sustained piece of work on something."[4] As I discuss in chapter seven, supervisors believe that an interest in the subject and a desire for knowledge is important if one is to see the process through to graduation.

Secondly, it means that the process cannot be predictable. Generating knowledge is more complex than developing skills and cannot be achieved in a fixed time period. Supervisors say, "I can't tell a student, 'You will make an important discovery by the thirty first of January'."[5] The process of developing research questions and designing research to investigate them is messy, it requires improvisation, it cannot be "neat and linear."[6] This makes it difficult to fit in with the requirements of funders and the efficiency imperatives of national planners.[7]

Developing a certain kind of person

Another view of the PhD relates to the kind of person that it results in. The PhD is awarded to those who display the characteristics of a scholar – one who displays independence, thinks in an academic way and shapes the intellectual landscape. One of the characteristics of the scholar is *independence* and the requirement to either be or become independent is widely voiced by supervisors.[8] Doctoral people are expected to be "independent and self-directed."[9] They "should demonstrate the ability to do independent work"[10] and "the ability to acquire knowledge on your own."[11] For some supervisors this means that "we don't believe there are that many people in

1 WPI04:41,57,93
2 WPI04:65; WPI09:67; WPI14:31,35; WPI15:131
3 WPI14:25
4 KEI10:38
5 WCI05:55
6 WPI05:43 also WCI05:51
7 KEI02:109; WCI05:55
8 CMI10:59; CMI12:45; CMI15:67; CMI22:163; KEI01:65; KEI02:167; KEI10:19; WCI05:191; WPI04:169; WPI05:33; WPI14:31
9 WPI04:169
10 CMI10:59
11 WCI05:191

this country who can write doctorates"[1] and that it is necessary to identify those that are "research material."[2] But others take a more supportive, developmental perspective, "I don't think in the, 'leave a person on their own and don't give them any help and support' kind of way, but some of it has to be done on your own."[3] For these supervisors independence is an outcome of the PhD: "I think it's building them as a scholar, so that when they finish they are able to operate more independently."[4]

For supervisors, the doctorate is an *academic* pursuit.[5] It entails working with a certain kinds of knowledge, ways of thinking and ways of writing which are characterised as academic, "you're forcing people to think in an academic sense."[6] In the process one learns "how to think about the world"[7] and how to "think in a scholarly way."[8]

> *If you've been a teacher, you've tended to, year-in and year-out, dumb down. You know – "Macbeth is a play about good and evil" – that kind of thing. And now you come in here, and they're suddenly [talking about] post-colonial Shakespeare. What the heck is that? And all this stuff. So you've got to bring them back into a world of where the academic debates are. (KEI08:71-73)*

At the end of the PhD, the graduate occupies "a different headspace" which enables them to work on more complex problems.[9] The PhD results in a certain way of using your mind, of conceptualizing problems and of communicating.

> *Once you have a PhD, you walk out at the end, you basically know how to do research. But I think it's more than that. It's how you apply your mind to issues, problems; how you learn from lessons of experience, best practices, apply, develop, you know. It's very good [for] problem solving, it's good for writing skills, it's good to address specific issues. Because we have a problem in government as well, people can't write, people don't know how to put statements on the table, they don't know how to engage. (WPI09:69)*

1 KEI08:19
2 KEI10:47
3 WPI14:31
4 CMI22:163
5 WPI14:25
6 WPI09:67
7 KEI09:59
8 WPI04:293
9 WPI05:73

This shift towards academic ways of thinking can be challenging for some people. A supervisor in public management says that, "a good example is, we have generals from the Defence Force, coming here to do PhD's and they're coming from a completely different discourse, and we're asking them to think in completely different ways, to write in different ways."[1] Some supervisors try to facilitate the shift in thinking required by people coming from non-academic backgrounds. They work to make explicit the requirements of the PhD and to develop the meta-cognitive skills required[2]; or to provide women doing PhDs with the role-models that they never had.[3] A supervisor says of prospective PhD candidates,

> *…they need encouragement. You need to encourage them and say, "Look, you have the potential, you can do it, go ahead." Unfortunately, our education system in this country hasn't been very accommodating, you know. It was a weeding out process, instead of a process that says, "Look, go ahead and start developing." (WPI09:31)*

The academic focus of the PhD is particularly problematic in the case of public and development management where there is a mismatch between what people expect of the PhD and what they get. For PhD, the focus is on problem solving, "they see it as contributing to what they're doing, … at the macro-economic level, as analysts and so on"[4] so that "in their heads it's a practical qualification, but actually it's an academic qualification."[5] This misconception is found among those who have come through the academic ranks as well as those coming from practice.[6] Supervisors describe the PhD as "about learning the academic culture" and "developing a scholar"[7] – despite the fact that 90% of their PhD graduates work in the public sector.[8] When I asked if this is appropriate for people who will not become academics, supervisors say that the academic perspective "gives them depth in understanding the issues that they are dealing with" and "assists in clarifying issues of policy and implementation."[9] The implication appears to be that an academic way of thinking is useful, even in non-academic contexts, because one develops deeper or more nuanced understandings.

1 WPI04:65 also WPI15:131
2 WPI04:9
3 CMI22:47
4 WPI09:27
5 WPI04:45
6 WPI04:49
7 WPI05:27
8 WPI05:13
9 WPI05:31

The PhD develops people into scholars or critical intellectuals. One supervisor spoke about how doctoral people developed "that identity of being a scholar, a researcher scholar."[1] And a supervisor in English studies suggested that the PhD produces "cultural and intellectual landscapers"[2] which are needed because "South Africa is not greatly resonant with the large idea of culture."[3]

Preparing for an academic career

There are a number of ways in which the PhD relates to academic work. Firstly, it enables one to participate in academic research. Then it is necessary certification for an academic post or for promotion within the academic ranks. It provides an opportunity to become familiar with other aspects of academic practice, such as teaching. And finally the PhD is seen to be a process of enculturation into a particular discipline and into the culture of academia more broadly. Supervisors comment on all of these aspects of the PhD.

Supervisors believe that a PhD is necessary for an academic career.[4] They say that the qualifications required for academic posts are changing, with ever higher demands being made, "Job advertisements used to say, 'an MA is desirable', now they say, 'a doctorate is necessary.'"[5] In mathematics and applied mathematics those nearing retirement can get away with having only a master's degree, but younger staff all require PhDs.[6] In English studies there were conflicting views. One member of staff said, "we do appoint people at very junior levels, but not permanently without it"[7] while another said that those doing PhDs may be "on the permanent staff because the minimum requirement for a lecturer is a master's degree."[8] But all members of staff were expected to go on to complete a PhD.

Many supervisors, particularly in mathematics and English studies, feel that those doing PhDs intend to pursue academic careers.[9] They say, "I'd probably have a bias towards thinking of them as future academics."[10] Some struggle to see a role for the PhD in non-academic work,

1 WPI04:233
2 KEI09:55
3 KEI08:75
4 CMI03:24; CMI09:52; CMI18:27; KEI01:28-31; KEI10:36; WCI02:83
5 KEI10:36
6 CMI09:56
7 KEI01:29
8 KEI08:21
9 CMI17:240; CMI19:19; CMI22:63; CMI23:27; KEI01:19 & 28-31; KEI08:21; KEI09:23
10 CMI23:27

saying that a master's is enough, "Why use three years of your life on a doctorate?"[1] Those studying the PhD part-time are assumed to be planning to move into academia.

> *[Name] is actually working, and he's got a good job. There's absolutely no reason for him to do this, except because he wants to. I'm not sure if it's because he wants the title, but that would be rather strange, because he's been going on for a number of years in great pain and suffering, so I think he's possibly thinking of an academic career. (CMI09:48)*

This conviction is strong enough to make supervisors feel guilty about encouraging people to begin PhDs without the prospect of academic jobs.[2]

> *I sometimes feel quite guilty about even encouraging students to do master's if there's no guarantee of some kind of academic route. Because it's just so difficult to get jobs. … It's difficult to get a job in humanities, well in English studies. There's no guarantee. Obviously with transformation … for bright young black students, it feels pretty safe to encourage people. But perhaps for other groups it's not as secure. (KEI09:27&39)*

The PhD provides an opportunity to learn the culture of the academic discipline. Becoming a member of a discipline involves developing an identity and commitment to the ways of the discipline, and taking on its cultural frame. This process is "at its most intense at the postgraduate stage, culminating in the award of a doctorate" (Becher & Trowler 2001:47). One learns the "rules of conduct" the "linguistic repertoire" and "the *savoir faire*" in knowing when to behave in which way (Becher & Trowler 2001:50). This sense of learning the culture of the discipline was evident in the responses of supervisors, particularly those who had been longer in the academic profession. Several made reference to the PhD as an academic apprenticeship and emphasized the need to learn the tacit skills of being an academic.[3] The PhD is a way of "inducting somebody into academic work"[4] and "learning an academic language."[5] Subtleties in how academics interact are best learned by observation,

> *… because they sit and they hear more experienced people giving papers and questioning, and they see that you can be attacked by your colleague for... on an issue and all that. They sort of*

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1 KEI10:43
2 Later in this chapter I discuss supervisor opinions of the academic labour market.
3 CMI15:199; KEI09:203; WCI05:31&63; WPI04:221; WPI05:45
4 KEI10:36
5 KEI08:89

> *start learning something about the robustness of academic debate, or snideness, or whatever. (KEI08:85).*

And this supervisor has a "strong sense" that the PhD should be "training in the discipline."

> *I suppose I have a kind of traditionalist view … I think it's a good thing that there's this very scholarly academic focus, sort of training in the discipline. I definitely have some investments, for whatever reasons, in that kind of view. … I see a lot of value in … a schooling in the discipline, a schooling in the modes of analysis and critique … I have this quite strong sense that it should be, [pauses] I would feel that something would be lost if it wasn't a training in the discipline. (KET03:67)*

Later in the interview she describes how her own PhD straddled two disciplines, English and history. She says, "I locate myself within English studies, so I'm familiar with the norms and the expectations here, but then I allow for journeys where I feel necessary, into other areas."[1] As a result of her own PhD experience she says that her "headspace is part English, part history, so it's just a kind of growing into a different way of approaching knowledge"[2] and that this was a valuable and "very, very rich experience."[3]

Those who see the PhD as leading to an academic career, think that it provides opportunities for exposure to other aspects of academic work. A supervisor says, "I think it has a role to play in preparing you, both for research and for teaching."[4] Another says, "I see them as future academics and that means that they have to be trained both in research and into the other aspects of academia."[5] This most commonly takes the form of participating in aspects of teaching, often through part-time or informal appointments as tutors.[6] As with other learning in the PhD, the model is one of learning by doing, "They take the tutorial groups and they're supposed to kind of learn from that experience."[7]

Since universities do consider teaching experience in hiring academic staff, it does seem important that it be part of any preparation for an academic career. But learning to teach is not always a part of the PhD. In English studies tutoring is confined to full-time students: "Well ... if

1 KET03:175
2 KET03:179
3 KET03:183&191
4 CMI10:27
5 CMI23:27
6 CMI09:64; CMI10: 35; CMI19:123; CMI22:83; CMI23:31
7 KEI08:79

you're a full-time PhD student, in fact you do [learn to teach] because you tutor, in the department … they're expected to tutor, … but once again, you won't find that many full-time PhD people around.[1] And in public and development management, a graduate school without undergraduate programmes, there are few opportunities to tutor.[2] In mathematics, tutoring work is organised according to departmental teaching needs and the financial needs of the tutors[3] rather than being informed by the learning needs of doctoral people.

Not everyone agrees, however, that the PhD should include exposure to teaching. One supervisor expressed doubt that it was possible to teach someone to teach[4] and another saw it as a requirement outside of the PhD.

> *A PhD is, in my mind, a training for research. It's not a training to be an academic practitioner. PhD's are sought by research organisations [not just] universities, in cases like CSIR[5] would want PhD's. And I think that if universities want their academics to be competent in teaching, that's a requirement that is separate. (WCI05:159)*

The expectation that PhD people will tutor can be problematic because it detracts from their research and slows their progress.[6] There are concerns about fairness in allocating tutoring work to those most in need of the additional funds.[7] And some believe that adding tutoring to the work of PhDs has less to do with developing teaching practice and more to do with exploiting cheap labour, "There are major problems with the number of PhD students that are used as, essentially, slaves."[8] This supervisor does not see teaching as central to the PhD and suggests that "there's a case for providing more money for PhD grants and using faculty money or departmental money to hire senior tutors to do that kind of teaching."[9]

There was little discussion among supervisors of learning other aspects of academic practice. Even supervisors who say that the PhD prepares for an academic career, have not considered academic practice beyond research and teaching. It appears that the interview prompts this supervisor to think along these lines.

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1 KEI08:77-79
2 WPI02: 70-78
3 CMI10: 211 also CMI02: 140; CMI08: 102; CMI14: 128-132
4 KEI10:32
5 Council for Scientific and Industrial Research
6 CMI10:39; CMI18:153
7 WCI08:105
8 CMI18:153
9 CMI18:165

> *But… you know, now thinking as I say this to you, I don't know where further teaching skills would come in. Because academics actually have to be quite well-rounded in the skills that they have. And we are required to do so much administrative work that a focus purely on research, while it's necessary, needn't be everything for an academic either. (KEI10:47)*

And later in the interview she warms to the idea of developing the full range of academic practice, although not necessarily within the context of the doctorate.

> *Ideally, the institution ought to provide all of the things that support people being good teachers, good administrators, good writers of research proposals as well as good producers of the research article, the book and so on. Quite where those ought to be situated I don't know… [pauses] I would like to see them as add-on aspects of the doctorate, rather than taking away from something of what is done in the doctorate now. (KEI10:54)*

Many supervisors, who are themselves academics, view the PhD as preparation for an academic career and this view is particularly prevalent in the pure disciplines. Across all four cases, the PhD provides necessary certification for an academic appointment. It also provides an opportunity to learn the culture of an academic discipline, although again this view was more obvious in the mathematics and English studies cases. However, there were mixed responses about the extent to which the PhD should develop skills in academic practice. While some felt that it would be appropriate for people to develop teaching skills during the PhD, there was no suggestion that this be a formal requirement and others felt that such skills development was inappropriate.

Ongoing career development

In the more applied fields, it is more difficult to view the PhD as preparation for academic work. In public management, where most PhD people study part-time, supervisors are aware that "they don't want an academic career."[1] And in civil engineering, "not everybody who gets a PhD is aspiring to an academic career."[2] In fact their PhD graduates "more commonly end up in industry."[3] But even in the pure disciplines, doctoral graduates pursue work outside of the university. In mathematics there was a growing awareness that graduates might end up working in the financial sector[4] where one of the supervisors herself has a part appointment.[5] To some

1 WPI04:39 also WPI05:13
2 WCI05:63
3 WCI05:67 also WCI09:63
4 CMI03:28; CMI09:52; CMI12:29&37; CMI18:27; CMI20:195; CMI15:47
5 CMI19:115

extent graduates are lured into such work because the financial rewards are good, particularly for the best black mathematics graduates,[1] but one mathematics supervisor felt it was important that more doctoral graduates sought work outside of the university. When asked if those graduating with PhDs in mathematics would go on to academic careers, he says,

> *Hmm, no. Because that way the universities would be really crowded, wouldn't they, if everyone with a PhD became an academic? I mean, some PhD's are designed, you're supposed to go out in the world and learn things and be useful. Don't just teach. If everybody who could get PhD's taught, then all the information is just recycled. We need to move forward. (CMI12:41)*

Supervisors in English studies acknowledge that some of their graduates would end up in other lines of work.[2] This English professor gives serious thought to how a PhD could be valued outside of the university.

> *I mean, if you've got skills in communication or public relations, you can make it in Lever Brothers or banks or anything, but ... you don't necessarily need a literary PhD. Perhaps Anglo-American would like it if you've got the PPE – the philosophy, politics and economics – which rounds off their top executives. But ... perhaps you could have it linked closer to the world of work. I mean, the world of work in literature is likely to be teaching, something like that. (KEI08:71-73)*

Whatever the stated purpose of the PhD, it is valuable outside of the academic sphere because "people are looking for highly-trained minds."[3] It's the other skills that make doctoral graduates valuable outside of the university, rather than specialized knowledge.

> *It's not just the physics you learn, it's the skills doing research and just thinking through quite a complicated problem. …observing stuff and taking the data and producing some kind of model - which is really what a lot of financial analysts do. They take data that's a continuous stream and turn it into ... a predictor of the future, I guess … So a lot of the skills are very similar, although there is some retraining, that needs to be done. (CMI15:51)*

So that a PhD in mathematics is "a certification of your abilities to do problem solving, to cope with certain levels of abstraction, to show originality" although there might be other ways to provide such certification.[1]

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1 CMI23:161. The small pool of black staff skilled in mathematics are in high demand, resulting in inflated salaries.
2 KEI09:27
3 WCI05:63

While the PhD is undoubtedly useful for other kinds of work, it is not appropriate to view it as *preparation* for a career. People enrolling for PhDs in applied disciplines are usually not starting out on careers.[2] In public management they come from established careers in medicine, agriculture, education and science looking for a management qualification,[3] and some of them are "big people in their fields, they've got a lot of expertise… I'm not quite sure why they want the PhD, but they are big, they're top of their field."[4] In civil engineering a supervisor reported a discussion with "high profile members of industry" who said of "people working for them, if they show a lot of potential, they will send them somewhere to do post-graduate research, but they're not looking for people coming in with a post-graduate qualification."[5] So in these fields the PhD is seen as another step in a career, or preparation for more senior roles.

When asked if the PhD should or could be changed to better prepare people for work outside of academia, this supervisor in English studies suggests that there be two tracks:

> *I think there's a lot to be said for that line of thinking, as long as it's not either or. I think you could certainly think about more than one track of further studies for people, and you could have, the track that is much more market-orientated, more emphasis on skills and so on. But I think the research-orientated track, which is how I look at the doctorate, is something that we should certainly keep. … I certainly wouldn't be adverse to the kind of thinking that produces two tracks. One a general purposes doctorate, just for the sake of a name, and then the other, a sharp focus on the discipline. (KEI10:45)*

The English studies department had in fact experimented with modifying their master's programme in order to reflect the wider realm of literary practice, but a supervisor explains that such experiments were not popular with students:

> *When we started the MA in essay literature, one of the options of doing the coursework phase was to be able to… we were quite flexible. You could treat it as the introduction to the edited edition of a book, or you could do it as a method of teaching a classroom – that sort of thing. But most of them didn't even want to take that up. (KEI08:71)*

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1 CMI10:23
2 WPI14:53
3 WPI04:41
4 WPI04:57
5 WCI05:71

His view was confirmed by another staff member who had taken up the option and felt that she didn't get a proper master's.

> *Now when I did my master's thesis, they were trying to make it more relevant, so I wrote an introduction to a book that … had been out of print for a long time. … I actually found the process quite problematic. It didn't feel like I'd done a proper master's, you know. I'd written an introduction. Yes, I had to do the same amount of work but the outcome seemed kind of trivial, even though it was meant to be relevant and meaningful. (KET03:199)*

Across all of the case studies supervisors acknowledge that more and more PhD people are not pursuing academic careers and that the PhD in its current form develops skills that can be used outside of the university. Many supervisors (although not all) are open to changing the PhD in order to better meet the needs of such people. However, they are not certain about how to bring about such change and are concerned to retain the specialist disciplinary focus of the PhD. These comments form part of a growing discourse which supports the view of the PhD as a step in ongoing personal and professional development.

Summarising supervisor views

Across all four of the case studies, supervisors indicate that the PhD is about generating knowledge by undertaking research. The key defining characteristic of the PhD is that it should result in original knowledge. They also agree that the PhD results in independence and an academic way of thinking. Many supervisors assume that doctoral people are already skilled in research and do not need research training, only varying levels of support in their research. Others, particularly in public and development management, are concerned to explicitly develop skills and to orient people towards academic understandings of knowledge.

For many supervisors, particularly in the pure disciplines, the PhD continues to be thought of as a qualification that leads to an academic career. But there is less clarity and views are less consistent about whether it is appropriate to expose people to other aspects of academic practice, such as teaching, in the course of their PhDs. In the pure disciplines there is greater concern with enculturation into the discipline as important for success in the academic context. In all four of the cases, but particularly in the applied disciplines, there is an awareness that many people undertake doctoral study as part of their ongoing personal and professional development and that more and more PhD graduates will work outside of the university. However, the PhD is still positioned as an academic degree which leads to an academic approach to knowledge and

thinking, and these academic ways of thinking are considered valuable for all kinds of work. What is clear across all the case studies, is that supervisors regard career preparation aspects of the PhD as secondary to knowledge generation.

4.5 Views of the PhD, resonance and dissonance

I have examined a number of understandings of the PhD which emerge from the literature, are implicit in policy and are expressed by supervisors. In this section I map these views and discuss the ways in which they resonate and suggest where they might result in tensions. In the process I examine the assumptions and discourses which underlie each position and the concerns for doctoral education which result.

The scholarly view

The traditional understanding of the doctorate is that it involves *doing research* to produce knowledge and serves to establish one as a scholar. This view originates in the early nineteenth-century German reforms which raised the status of the Doctor of Philosophy degree at a time when the scholar was being repositioned as one who generates knowledge.[1] The focus is on producing knowledge and thereby demonstrating scholarship. The PhD as the pursuit of knowledge was strongly articulated by supervisors across all four case studies. They speak of the need for PhDs to be original work that contributes to the body of knowledge and of the PhD as a research degree. This understanding is least well articulated at the level of national policy, where the role of the PhD in generating knowledge is hardly acknowledged.[2]

If the PhD is viewed primarily as an exercise in knowledge production, then it is valued for the contribution which is made to knowledge. The focus of the PhD becomes how best to generate knowledge – how to identify an appropriate research question that is interesting (to the individual and the discipline) and can be asked; what tools or techniques are available to answer that question and how to apply them; and how to report the results in a form acceptable to others working in the field. And these questions are usually addressed within the context of a specific discipline, with its internal epistemological and social rules for valuing and generating knowledge (Becher & Trowler 2001:47-51). Concerns which predominate include what knowledge can be produced, by what methods and how to evaluate the contribution.

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1 See chapter two.

2 While policy documents do imply that doctoral graduates will go on to produce knowledge that is of value to the economy and society, there is little acknowledgement that they might produce such knowledge in the course of their doctoral studies.

The scholarly view of knowledge generation has its roots in modernist, rational discourses of science. During the nineteenth and twentieth centuries, as rational, scientific knowledge enjoyed ascendancy, a distinction grew between abstract, theoretical knowledge which emphasises general, widely applicable principles and applied, practitioner knowledge which has more limited, local application. This distinction became entrenched with universities positioned as centres for the more highly valued abstract, theoretical or "academic" knowledge (McClelland 1980:125). Supervisors who embrace the scholarly view insist that the doctorate should produce academic knowledge which is "evidence-based"[1] and that it must include "good empirical research" that "advances the theory."[2] Across disciplines, doctoral theses are required to pay homage to science and be measured against criteria informed by a modernist, rational paradigm. In fact "science is often used as a synonym for research" (Craswell 2007:380).

From the scholarly perspective, the PhD is expected to result in an independent or autonomous scholar (Johnson et al. 2000:137; Lee & Williams 1999:11; Tennant 2004:440). The PhD is about demonstrating one's ability to do research and the person undertaking doctoral studies is assumed to already have research skills. In their critique of traditional doctoral education, described as the "pedagogy of indifference," Johnson, Lee and Green explain how doctoral students at Oxford were required to "reveal themselves as 'always-already' having the capacities for which they were to be credentialed at the end of the PhD process" and "to demonstrated that they could work on their own without supervision" (Johnson et al. 2000:138). The PhD person is expected to be familiar with key results or theories, relevant epistemologies and the research tools of the discipline, usually through having completed honours or master's degrees.

This view is evident among supervisors in this study who expect candidates to display the characteristics of a scholar and be able to do independent research. A doctoral person should be "somebody who is clearly research material, as we put it."[3] Such assumptions about the kind of person that can undertake doctoral studies are at odds with local concerns to increase access. The centrality of independence and autonomy in doctoral education can be traced back to the notion of the "Man of Reason" and the line of Western philosophical thought that led in the seventeenth century to Reason becoming "not just a distinguishing characteristic of mankind but … a distinctive way of thinking … a precisely ordered mode of abstract thought" (Johnson et al. 2000:139). Feminist critiques of Reason associate it with the independent masculine as

1 WPI15:31
2 WPI14:27
3 KEI10:47 also WPI04:169; CMI10:59; WCI05:191; KEI08:19

opposed to the dependent feminine (Johnson et al. 2000:140) and this suggests that the identity of the "autonomous scholar" might be difficult for many people to aspire to.

> *That the ideal of the autonomous self is unproblematic [in doctoral education] testifies to its centrality to the history of the PhD, at the same time as it indicates how powerfully but silently its assumptions about who has the right to regard themselves as ready to take on the mantle of the subject of Knowledge, the 'one who knows', continue to operate unscrutinised. (Johnson et al. 2000:143).*

The views which characterize the PhD as (1) doing research to generate new knowledge, and (2) developing (or revealing) a scholar, have proved to be enduring. They can be detected in university descriptions of the PhD and are frequently expressed by academic staff. These views consider that doctoral education results in knowledge and people who are scholars, with the larger goal of adding to the sum of human knowledge. I call these the *scholarly* views of the PhD.

The labour market view

A second range of views of the PhD can be characterized as *labour market* views in which doctoral education produces highly-skilled people who will find employment as academic staff, researchers and in other positions. The idea of providing human resources for labour markets is evident in South Africa at the level of national policy, but is also expressed by some supervisors. In this view, doctoral education results in "highly trained minds" and certifies people for academic, research and other labour markets. The PhD provides high-level skills with a focus on employability of graduates (Craswell 2007:380). This understanding of the PhD is supported by discourses of instrumentalism and efficiency (Blume 1986:219) and the "master narrative of the market" (Ball 1998:126) and is underpinned by a commitment to market responsiveness (Ball 1998:122-123).

From this perspective, the person undertaking the PhD is seeking entry to a career and the knowledge and skills gained during the PhD are directed towards success in that career. It becomes important to identify the potential careers of doctoral graduates, the skills they will require and effective ways of training them in these skills. There are variations along a spectrum. Some views consider the PhD to be primarily preparation for an academic career, others as preparation for a research career and the increasing trend towards doctoral graduates working in industry, business or non-profit organisations, has seen moves towards better preparing them for work in such contexts. The labour market view of the PhD can be characterised by (1)

training in research skills, and (2) doing research in order to develop those skills. Doctoral education results in highly skilled human resources, with the larger goal of supporting and growing the knowledge economy.

The PhD has always had something of a career focus. From its origins as a teaching qualification, it became widely viewed as preparation for an academic career although not, until more recently, a prerequisite (Huisman & Bartelse 2001). The idea of the PhD as preparation for an academic career is perhaps the area of greatest resonance between the scholarly and labour market views. However, there are different emphases. For those who adopt a scholarly view, the belief that academic teaching is best effected by engaging students with research, implies that being a scholar and active researcher is sufficient qualification for an academic career, particularly when supplemented by exposure to the academic environment in the course of the PhD. The labour market discourse on the other hand, leads to a consideration of the full range of skills required to engage in all aspects of academic practice including research, teaching and academic citizenship (McAlpine & Hopwood 2007). While the PhD most obviously develops research skills, there have been growing calls for it to be expanded to develop skills in teaching and academic citizenship, and there is increasing research into the extent to which it does.[1]

There is also a degree of commonality between the two views when it comes to preparation for a research career. Traditionally doctoral education has resulted in people able to undertake academic research. The labour market discourse extends research training beyond the academic context to develop skills needed for research in other settings. Skills may be developed in a learning-by-doing model with the PhD person participating in the activities of the academic or research workplace, or there may be more explicit skills training. So that the PhD as preparation for a research career can be interpreted as a modification of the scholarly view of the PhD rather than a radically new understanding.

But when it comes to the PhD as preparation for careers in industry, business or non-profit organisations, the labour market view has little in common with the scholarly perspective. The emphasis shifts to training in transferable skills. However, there are inherent limitations to the transferability of skills between higher education and other work places because problems are context-bound and the ability to function well in an environment depends on tacit knowledge which can only be learned in that context (Craswell 2007:382-383). So a PhD undertaken in an

[1] For example the conference "Preparing for Academic Practice: Disciplinary Perspectives" held at the University of Oxford, 8-9 April 2008.

academic department might effectively prepare one for an academic career, but not for work in a research institute, and a PhD undertaken in a research institute might effectively prepare one for a research career, but not for work in industry (Craswell 2007:383). Graduates from research degrees still need to "learn on the job, to adapt and refine skills acquired during candidature, to continuously expand their skills base" (Craswell 2007:384).

The labour market perspective of the PhD as career preparation promotes the idea that it is undertaken towards the beginning of one's career and terms like "junior scholars" (Golde & Dore 2001:5) are used to describe doctoral people. As we will see in the following chapter, "PhD students in South Africa are mostly older people either established in teaching positions in the university or in careers in the public, private and NGO sectors" (Backhouse 2008:11) and the focus on younger doctoral people leads to the provision of skills training that is inappropriate for the needs of the majority of doctoral people and continues to position older people as exceptions and outsiders (Hewlett 2006:111). Furthermore, taking the position that the PhD prepares one for a career assumes that people will have identifiable careers and career paths. While this may be true in some professions where specialist training confines one to narrow career paths, many doctoral graduates have complex and changing patterns of employment and self-employment (Backhouse 2008) and the notion of a "career path" has been challenged (Bridges 1996; Pink 2002).

The idea of the PhD as career preparation has led to an assumption that during this period of study, one must accumulate all the knowledge and skills that will be needed for the duration of that career. This has led to reform agendas which suggest that future academics learn teaching, research and administrative skills; that future researchers learn not only how to carry out research, but how to source funds and to work in research teams; and that graduates learn how to sell themselves in a competitive labour market. Taken to extremes, this position results for example, in the careful unpacking of the tasks of the professional mathematician and the suggestion that the PhD ought to prepare the graduate for all of these tasks (Bass 2006). The problem with this approach is that these agendas are "inexorably additive" (Bass 2006:116), leading to an ever-lengthening list of things that need to be added to the PhD.

The labour market view leads to a shift away from doing research and the knowledge produced, and emphasises the training of the person, but it also has an investment in knowledge. This view embraces the idea of a knowledge economy and encourages the production of knowledge that results in economic benefit. Doing research is still considered an integral part of the PhD. The

difference is that the highly-skilled person is considered a more important output than the knowledge itself and research is undertaken in the interests of developing research skills rather than with the goal of producing knowledge. By contrast, in the scholarly view of the PhD, the knowledge produced is more important.

The ongoing development view

Somewhere between revealing an independent scholar and training a skilled human resource is another perspective, that of developing an intellectual who is able to critically engage with knowledge. This emerging discourse offers the possibility of a third perspective on the PhD, positioning it as an engagement with knowledge that develops a person. This *ongoing development* perspective of the PhD considers doctoral education to be a process of personal and professional development during which the candidate engages with knowledge and transforms into one who is able to apprehend the world in new ways, with deeper, more extensive or more intricate understandings. People who view the PhD as ongoing development also believe that the PhD should produce new knowledge and this perspective differs from the labour market view in that the knowledge produced is an important end result of the PhD. But in this case the development of the person is as important as the generation of knowledge.

McAlpine and Amundsen suggest that the "developmental perspective situates the doctorate as part of a life-long journey" (McAlpine & Amundsen 2007:23). And metaphors of journeys abound in the interviews – "it is a very personal journey"[1] and "I find it like, this enlightening journey, and I'm very excited about it."[2] The frequent use of journey metaphors by respondents in this study[3] suggests that the idea of the PhD as part of a longer life journey, resonates strongly with their experiences. This view also resonates with the many "personal" reasons that people cite for doing a PhD, including that it fulfils early dreams[4] and is a source of pride.[5]

The ongoing development perspective characterizes the PhD graduate as a critical intellectual who provides thought leadership for society. This idea is not new. Rousseau suggested that the "learned of the first rank" should be given refuge in the courts in order to promote "the happiness of the people they have enlightened by their wisdom" (Johnson et al. 2000:140). One finds in the literature recommendations that "developing critical thinkers must become an

1 CMI21:168
2 WPI07:287
3 CMI05:183; CMI21:206; KEI06:114, WPI01:216; WPI03:275; WPI04:211,277; WPI07:85; WPI14:102;.WPI15:131,171,199
4 WCI02:7; WCI04:23; CMI05:11,19
5 WCI04:19; CMI01:197,253; KEI11:30

integral part of the intellectual climate of a doctoral program" (Elkana 2006:74) and in an Australian study, PhD people spoke of "the increased 'mantle of responsibility' that came with their new identity and acknowledged that their new role would bring with it more ability to articulate concerns and interest in a public arena" (Malfroy & Yates 2003:128). The ideas expressed by supervisors in English studies that the PhD produces "cultural and intellectual landscapers"[1] and in public management that doctoral graduates are able to apply their minds to issues and problems in new ways[2] "because … in government … we need to engage with those kind of issues"[3] point to this kind of person being expected to emerge from the PhD.

This view is less prescriptive than the scholarly view about who might undertake PhD studies. It does not expect PhD people to already have the characteristics of a scholar, allowing that a wider range of people have the potential to develop. And it goes beyond the instrumentalist skills training aimed at usefulness in the labour market, to a more holistic development of the person. Concerns are to construct a highly individual experience organised around the unique development needs of each person. The PhD as an individualized programme of development supports the idea of responsiveness to individual and societal concerns rather than responsiveness to the market. McCormack tells the story of someone who conceived of "research as a process of personal transformation" and ran into difficulties with the university's timeline for her studies. Rather than work to the imposed timeline she "reconstructed her postgraduate experience to realign with her conception of it" and completed after seven years. (McCormack 2004:326-327).

This perspective is voiced by supervisors in this study who are concerned with the development of a person,[4] who emphasis meta-cognitive skills and understanding the requirements of the PhD,[5] and who work to provide PhD people with role-models that they never had.[6] It also supports the access and redress imperatives in South Africa by encouraging a wider range of people at all stages of their careers and in different career configurations to consider doctoral studies. And by modifying the ideal of the autonomous scholar in favour of a less exclusionary critical intellectual, it opens up the possibility of doctoral studies to people who might not be considered "research material."

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1 KEI09:55
2 WPI09:69
3 WPI09:27
4 WCI05:55
5 WPI04:9
6 CMI22:47

The *ongoing development* perspective of the PhD considers doctoral education to be (1) engaging with knowledge generation that (2) results in personal development. The PhD results in knowledge and thinking people with the larger goal of developing critical intellectuals who will make the world a better place. This understanding is supported by discourses of social responsibility and equity and is strongest in the interdisciplinary and applied areas of knowledge, but can be observed across all disciplines.

Comparing the three views

I have identified three views of the PhD which are present in the South African context. The scholarly view considers the PhD as being primarily concerned with the production of academic knowledge and in the process, with establishing scholars. The labour market view sees the PhD as skills development for a career, and considers generating knowledge for the knowledge economy as a secondary goal. The third perspective considers the PhD as an engagement with knowledge generation in the interests of ongoing professional and personal development, giving equal weight to the knowledge generated and the development aspects. Within the South African context, understandings of the PhD range across these positions with policy articulations adopting a labour market perspective, academic institutions and some supervisors a scholarly perspective, and the ongoing development perspective evident among other supervisors.

There is substantial resonance between the views. All three include the generation of new knowledge and learning on the part of the PhD person. All result in knowledge (the product) and a particular kind of graduate (the person). They entail doing research, to agreed standards of academic rigour, at the frontiers of knowledge and expanding those frontiers. There is agreement that the PhD should result in a learned person, and that the learning should reflect both breadth and depth of engagement with the subject matter. And there is agreement that the graduate should possess a wide range of skills, both generic and specific to the kind of research being undertaken.

Of course the three views cannot be neatly compartmentalised and there is some blurring and overlap between them. Each of the three views discussed includes a range of positions making it perhaps more appropriate to refer to them as clusters of views. The table below summarises key features of the three understandings of the PhD.

	Scholarly	**Labour market**	**Ongoing development**
Product or output of doctoral education	• New knowledge • An independent, rational scholar	• A highly-trained human resource • Knowledge for the knowledge economy	• A critical intellectual • New knowledge
Overall goal	• Increasing human knowledge	• Supplying human resources to the labour markets	• Making the world a better place
Assumptions	• Only a certain type of person is "research material" • PhD people already have research skills • Knowledge (of a certain kind) is valuable	• People have identifiable careers which need identifiable skills • The PhD comes near the beginning of a career • Knowledge must be useful or profitable	• All people have the potential to develop intellectually • The PhD occurs at various points in people's careers. • Personal development contributes to social development
Discourses	• Modernist • Scientific • Rational man	• Liberal • Market-driven • Knowledge economy	• Critical • Social responsibility
Concerns	• Identifying new knowledge • Identifying people who are "research material" • Ensuring originality and independence	• Identifying likely careers • Identifying necessary skills • Accreditation and certification • Efficiency	• Facilitate personal development • Allow creative engagement with knowledge

Table 4.1: Three understandings of the PhD in South Africa

While all three clusters of views see the PhD resulting in new knowledge and learned people, they differ in the weight they assign to these outcomes and hence in their focus. The scholarly views are primarily concerned with knowledge generation, with the scholar being a by-product of knowledge generation. For the labour market views, knowledge generation is secondary, being pursued as a means to learning research skills. The ongoing development perspective regards both the knowledge generated and the developed person as equally important.

The three different perspectives make different assumptions about the kind of people who do PhDs. The scholarly views assume that people come to the PhD displaying at least some of the qualities of the scholars which they will become; the labour market views assume that PhD people are young and starting out on a defined career path; and the ongoing development views are more accommodating of a wider range of people with a wider range of skills and intentions.

They also seek to cultivate different characteristics in the PhD graduate. The scholarly views are concerned with developing (or revealing) the qualities of a scholar in the process of doing research. The labour market views seek to train highly skilled human resources in preparation for careers, with the skills being developed in response to market requirements. And the ongoing development views are concerned with personal and professional development towards becoming a critical intellectual. In this case the focus is on a process tailored to the needs of each individual. How these different views impact on the practice of doctoral education is examined in chapter six.

The three clusters of views are informed by different understandings of the larger goals of doctoral education. For the scholarly views, the goal is to increase the sum of human knowledge. The labour market views seek to support the growth of the knowledge economy and the ongoing development views have the larger goal of increasing the number of thinking people in society in order to make the world a better place. In a complex adaptive system, the goals towards which agents strive and the ways in which they measure success are defined and modified by the agents of the system (Axelrod & Cohen 2000:121), and as I noted in the introduction, multiple goals can co-exist. This range of goals and the ongoing conflicts and debates between the different role-players in doctoral education are part of this ongoing negotiation of the meaning of the PhD.

4.6 Conclusions

Views of the PhD cluster into three groups: the *scholarly* understanding of the PhD as knowledge generation and scholarship, the *labour market* understanding of the PhD as skills development for knowledge generation and the *ongoing development* understanding of the PhD as engaging with knowledge to develop critical intellectuals. Scholarly understandings agree that the PhD entails doing research which results in academic, disciplinary knowledge, and in the process demonstrating that one is a scholar. Labour market understandings are focused on skills training in preparation for a career. They include the goal of producing knowledge which benefits the knowledge economy as part of the research training. The third group of understandings position the PhD as a process of *ongoing development* of an individual in the process of generating and exploring knowledge. During this process, individuals develop different understandings, ways of thinking, a capacity for critical thought and greater self-knowledge.

There is some commonality between the three views. All see the PhD as resulting in knowledge and a particular kind of person. But the views differ in the relative emphasis on each of these

outcomes; in the assumptions they make about people undertaking doctorates; and in the characteristics of PhD graduates. The three views also have different understandings of the larger goals to which doctoral education contributes. The labour market views are most evident in policy while institutions adopt scholarly views and supervisors express both scholarly and ongoing development perspectives. The tensions between these different views will become apparent, particularly in chapter six which examines the practice of doctoral education.

In this chapter I explored the question: "What is a PhD?" I examined national policy documents and university documents to understand the views of policy makers and administrators. I examined the views of supervisors in the four case studies and drew on the literature to map out three clusters of views of the PhD that coexist in the South African context. In the next chapter the people who do PhDs take to the stage to tell their stories – what brings them to doctoral studies and what they expect of their doctoral education.

Chapter Five

PEOPLE WHO DO PHDS

Understanding who undertakes doctoral studies and why

5.1 Introduction

We all think different, we have different reasons why we want to do a doctorate. (KEI11:159)

Sally is a senior researcher in a government department (it might be water affairs or environmental affairs or agriculture). Although she has worked there for more than fifteen years, she needs a PhD if she is to get the next promotion. She registers and sets up a research programme related to her work. Then the department changes their promotion criteria; she no longer needs a PhD. In fact they will no longer support her studies because they are supporting too many first degrees. But she is interested in her research and really wants to know the outcome. Others in the department also want to get hold of the results of her work. She decides to continue anyway. She has minimal contact with the university, but she knows about doing research and she has access to the equipment and sites she needs, so she gets on with it.

Victor has a master's degree and an academic teaching post at his local university (which may be in Malawi or Nigeria or Zimbabwe). He wants to do a PhD in order to be able to contribute more to the development of research in his department, but there is no-one to supervise him so he spends years searching for funding in order to study in South Africa. When he eventually secures it, he leaves his family and moves to Johannesburg. He studies for two years and his funding is abruptly withdrawn (perhaps because his country is placed under EU sanctions or perhaps because his supervisor leaves the university). He takes on lecturing work (or consulting work) and his PhD drags on for several more years. But he sticks it out because it's a really good opportunity. He looks forward to going home, to his family, familiar surroundings and his work.

Sarah has a long-standing interest in the economic development of Africa (or perhaps in environmental issues or questions of health). After graduating at her local university in East Africa, she worked for some years before getting a bursary to complete a master's degree in Europe. She went back home and worked her way into senior positions in the NGO sector. Now she is looking for a career change and wants to position herself as a consultant on development in Africa. In order to secure consulting work, particularly from the large foreign and international agencies, she needs to have a PhD. She comes to study in South Africa

because she wants to work within the African context. She funds her studies by taking on short consulting contracts in between longer periods of research and writing. She may (or may not) have to accommodate a husband and children in her plans.

Peace is a young man from South Africa (or perhaps from Zimbabwe or Botswana). He attended good schools, excelled in the sciences, and earned a scholarship for university studies. As he progressed from his first degree and got more involved in research, an academic research career became attractive. Getting a PhD is really the first step and he enrolls as a full-time student. He has been able to access national research funding and with support from his family has few financial concerns. He takes on some tutoring work in the department as a way to learn more about academic work. He is under considerable pressure to publish in order to establish a research record and secure a post-doc position, preferably in Europe or America. He works hard on his research, on learning the intricacies of access to research funds and on building his academic reputation.

These compound biographies of people who do PhDs illustrate the range of reasons why and circumstances under which people undertake doctoral studies in South Africa. Much of the current research into doctoral education focuses on the academic context and assumes that people completing PhDs are young, studying full-time and are destined for academic research careers. In particular, the literature on doctoral education that emanates from Europe and the USA makes reference to PhD students as "early career researchers" (Brooks & Heiland 2007; Eisenhart & De Haan 2005; Golde & Walker 2006; Huisman & Bartelse 2001:51; Mathieu & Adams 1997; McAlpine & Hopwood 2006; Önnerfors 2007; White 2004). While there is some acknowledgement of the diversity of those engaged in PhD studies, such acknowledgement is often of the exceptions, which serves then to reinforce the "normal" (Nerad 2004). These assumptions inform what research questions are asked, what emerges from the research and consequently, what is viewed as important in doctoral education.

The biographies which emerge from this study make it clear that students who are older, who are working in some capacity while they study, who have substantial work experience and who are negotiating careers which, while they may intersect with academia, more often move across other sectors, are not an aberrant minority. They are in fact "typical" in the current South African context. This realization has important consequences for our understandings of the goals and purposes of doctoral education; for how doctoral education is organised and carried out; for what should and should not be learned; and for how people are recruited to doctoral

study and supported through the process. In section 5.2, I examine the life stories of the thirty-six people interviewed who were working on their PhDs. Five typical life paths emerge, each with its own characteristic patterns. In section 5.3, I examine what people say about why they undertake the PhD.

Various frameworks have been proposed that map the domain of doctoral education (Lee et al. 2000; McAlpine & Norton 2006). While these frameworks are appropriate for the contexts in which they were developed, they do not take account of the kinds of people that undertake doctorates in South Africa. In section 5.4, I propose a framework of *intersecting contexts* that places the PhD person at the intersection of a number of contexts each of which has an impact on whether and when they study, the circumstances under which they study, the identities which they need to negotiate and their possible future paths. The intersecting contexts framework provides a means to engage with the motivations and goals, circumstances, resources and future plans of PhD people and will be used in chapter seven to understand how they negotiate their studies.

5.2 Paths to and from the PhD

I have described in chapter three how I constructed stories from the interviews with doctoral people in order to "to make a large number of accounts brief enough to keep them visible during the analysis" and to ensure "that poor recall, or an excessive focus on elements that I related to, did not skew my understanding." In this section I analyse those accounts. While many of the supervisors also gave useful insights into why and how they had come to complete a PhD, I do not include their stories here as they were all people who had chosen to pursue academic careers and I did not want to overemphasize that career choice.

Initial readings of the PhD stories revealed that factors including educational background, the ease of access to educational opportunities, interests and personality, family circumstances, work experience, disciplinary affiliations, and plans for future work all influenced the decision to undertake PhD studies. What became clear is that the PhD fits into a wide range of different life paths at any number of different points in time. Despite the diversity, similarities were observed among those of similar age and who had made similar career choices and these became significant factors in characterising different kinds of doctoral people.

Those embarking on doctoral education are by no means young. For someone completing school at eighteen,[1] the fastest route to a PhD in the South African education system would be three years to a bachelor's degree, one year of honours, one or two years to a master's and they would begin the PhD at 23 or 24. If they take the prescribed three years to complete, they would be 26 or 27. And this is the absolute minimum; in fact most are likely to have had some interruptions or delays in their studies. This means that it is difficult to characterise any of those doing PhDs as young. In South Africa one is considered a mature age learner from the age of 23,[2] making the term irrelevant for this study.

However, doctoral people of different ages have different concerns and needs. McGivney has pointed out that students in their early to mid-twenties, while often technically included in definitions of adult learners, have different "lifestyles, learning goals and aspirations" from those in their 30s, 40s and 50s (McGivney 2004:33). She also distinguished between those who have studied continuously and those who have "had a gap since completing full-time education" (McGivney 2004:33). For the purposes of this study I found it useful to distinguish between those PhD people in their twenties who had generally studied continuously without working and had few family responsibilities; those in their thirties who were in the process of establishing their careers and families, and those over the age of forty who had established careers and families.[3] In general I refer to anyone below the age of thirty as "younger" and above the age of forty as "older".

Career choices are reflected in the work people have done or currently do, the work they plan to do and the work they would like to do (but are not able to). Among doctoral people, the university looms large as a potential employer, but less so than might be assumed. The people interviewed fell into two broad clusters – those who had worked or planned to work primarily outside of the university sector and those who had worked or planned to work primarily within universities. And these clusters divided further into those more established in their careers and those starting out. There were those who were established in positions outside of the university sector had no intention of moving into university employment. Then there were those starting out on their careers who were planning to work outside of the university. On the academic side, there were many established academic staff who held teaching positions in universities, and

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1 Assuming they were six when beginning twelve uninterrupted years of schooling.

2 From the age of 23 people in South Africa qualify for access to higher education without a matriculation endorsement – a practice known as 'mature age exemption'.

3 There is some precedent for this categorization in the differentiation made by Buchler et. al. between students younger and older than thirty (Buchler et al. 2007:136-8).

planned to continue in these positions. Correspondingly there were younger people with little work experience who were planning academic careers – usually with an emphasis on research.

But not all fell neatly into these categories and the exceptions formed a substantial group in their own right. This consisted of people who had moved between the university and other sectors over the course of their career, or were planning such moves, two reluctant academics who worked within the university sector but would have preferred not to, and those who wished to work in the academic environment but had not been able to. I call these the *nomads*. I group the short stories into these five categories – established professionals; aspirant professionals; established academics; aspirant academics and the nomads – in the analysis which follows.[1]

People who choose non-academic work

Many people who embark on PhD studies are in their thirties and forties and well established in careers outside of the academic environment. Less frequently, people who have moved continuously from school through to doctoral studies are planning a career outside of academia. These are their stories.

People established in non-academic careers

A good example of this kind of doctoral person is this older South African woman who begins by training as a scientist, has a long career in a state research institution and decides to do a PhD late in life. Here is her 'short story':

> *I'm from the Northern Cape. Long ago I wanted to do marine biology, so I did a BSc with maths and zoology at the University of Port Elizabeth. I went to Free State University, did my honours there in fresh water ecology, looked for a job and ended up here – twenty years ago. I'm part of the furniture. I did my master's on macro invertebrates. We started implementing the new Water Act [which has] two water rights – basic human needs and the ecology. [There is] very limited information available, nobody really knows the requirements of the invertebrates, specifically. That's the main aim of my studies. I'm on senior specialist scientist level. At that stage in order to progress you needed a PhD. I got the bursary, I decided ok – meantime they've changed the system, so now we don't need a PhD anymore. But its fine, I'll do it anyway. (WCT04)*

[1] I use the term "professional" in order to avoid using the term "non-academic". It is of course not an ideal term, since academic work can also be viewed as professional.

This is a competent and confident researcher with substantial research experience who begins her PhD in order to get promotion, but then finds the conditions for promotion have changed. However, she is working towards results that are needed for her work, her research forms part of her job and she is able to continue with the PhD with very little interaction with the university.[1]

A second example is a civil hydraulic engineer who moved to South Africa after completing her undergraduate studies and was employed in the public sector. She sought further education as a way to "upgrade my hydraulic knowledge."[2] She took a full time research position at the university in order to work on her PhD and recounts debating the decision with herself. "Actually I don't need PhD because I didn't plan to stay in academic. From other side, I am person, if I have this opportunity… why not?"[3] Later she describes the PhD as "only our personal goal."[4] That she is well established in her profession is evident in this reflection about being in demand for consulting work.

> *I had a lot of private consulting because for reserve determination, often team required to have one hydrolician, and because there's not too many in South Africa, who has this understanding of low flow hydraulics, and sometime company need somebody, and I'm very busy. I go, "Look I can't, I'm very busy." They go, "No, please?" And this was a tough time, because I have to carry on research, do some private job. (WCT01:195)*

When I interviewed her she was making the final changes to her thesis and had accepted a position in the private sector.

Another professional engineer, a man from West Africa, completed his undergraduate studies in his home country, followed by a master's degree in South Africa. He then found a job in Lesotho, but "it became very routine and it wasn't giving me any challenge"[5] so he completed a second master's degree and moved on to another position in South Africa. His supervisor contacted him and suggested that he work on a PhD. He describes this movement between professional work and study. "My life has been like that – I work for five years, I come [and study], I work…"[6] He plans to consult once he has graduated. "Mostly I've been working with

1 WCI10:67,151
2 WCT01:11
3 WCT01:21-25
4 WCT01:33
5 WCT10:39
6 WCT10:35

private consultants and I think after, I'll continue working… but I think, this time, I would like to go on my own."[1] When asked if a PhD is necessary for consulting work in his field he responds, "Ooh no, not at all, not at all. Well it depends, because with some consultancy work, it's more research-related, so if it is in the field, yes it helps."[2]

Further education as stimulation, as a break from employment and with a view to consulting work is also evident in the story of this woman:

> *I began as a biologist, did ecology for my first degree and got a scholarship to study environmental science. (The Australian government gives scholarships to people from the developing world – a fantastic opportunity.) I thought I would end up in that line [but] didn't enjoy the natural sciences as much as the social sciences. After my two years master's programme I came back to work for the NGO world – that's how I got into social science. I'd always said I'd do a PhD. After working for a number of years [it was] time to take a break from employment. I wanted to study in Africa because I was interested in the development issues in Africa. South Africa seemed a logical choice. I intend to position myself as a development consultant so the PhD would add value to my career. I could be an authority on a certain aspect of development. I had a good job, I could have continued and gone up the ranks but that's not what I wanted to do. I've always liked research [and] wanted to contribute to the generation of knowledge. (WPT07)*

Shifts at the PhD level from the natural sciences into the social sciences are not unusual. Another such story was recounted by a South African woman who had completed a master's degree in science and had been rapidly promoted to a management position in the public sector. She was under some pressure from the head of her department to complete a PhD and she felt that because she was managing scientists, many of whom had PhDs, it was important for her to have a PhD as well.[3] She decided not to do her PhD in the natural sciences, because she is now working in management and "because of my public sector background, I wanted to get more involved in policy and policy issues."[4] While she works and plans to continue working outside of the university sector, she was closely involved in research. Not only was research an important part of informing the policies that she was responsible for implementing, when I interviewed her, she had just come from presenting a paper at an international conference and she was very

1 WCT10:59
2 WCT10:67
3 WPT06:61-65
4 WPT06:23

excited about this.[1] For her the PhD was both a job requirement and a very exciting means of gaining knowledge and developing skills which she could put to use in her work.

Another South African, also employed in public sector science, shares this view of the PhD as a source of learning although her employers had in fact discouraged her from studying.[2] She says:

> *I like doing the research. I mean, over the past three years where I have been working for the department I have done other parts of research or been involved in previous research … continuing to present papers or inputting into papers and things like that. But specifically to my job … I mean my topic relates exactly to my job, but in terms of actually doing a formal degree in order to do it, it's irrelevant. It just holds me in better stead and it's what I wanted to do. (WCT09:59)*

Some study just because they love learning. A schoolteacher explains that his grandfather inspired in him a love of language[3] and that now, "I've got this passion for it."[4]

These are people who are established in their work and while the PhD may open opportunities or allow career shifts, they have no interest in academic work. The focus in the PhD is on doing research that leads to knowledge relevant to their work. The PhD does not directly add to their ability to do their work, rather they study for their own satisfaction.

People anticipating non-academic careers

It seems that not many people embark on a PhD directly after their undergraduate and master's with the intention of pursuing a career outside of academia, but I did interview two people in this position.

The first, a young man, completed a B.Sc. with honours in mathematics at the University of Zimbabwe where he "happened to be among the best students, and [was] enrolled straight forward to master's."[5] He excelled in his master's and earned a scholarship for doctoral study, but spent five months lecturing because he "had a lot of problems in trying to get supervisors, especially in the field of mathematical finance - really, in Africa, there are very few people who are in that area."[6] He had intended to pursue an actuarial career, but commercial subjects were

1 WPT06:73-77
2 WCT09:279
3 KET07:24
4 KET07:47
5 CMT08:10
6 CMT08:14

not offered at his high school and his A level marks had not been good enough for entrance into actuarial studies.[1] However, he planned to work in the financial sector after graduating. He was keen to apply his knowledge "in a real-life situation"[2] and acknowledged that the prospect of earning well was attractive. He says, "I do love money a lot … but still I need to go there and really see how these things really do apply."[3]

And here is the story of a young African woman who is also doing a PhD after years of continuous study. She is planning a career consulting in public finance.

> *I'm a Kenyan. I came to South Africa to study my first degree. I wanted to study away from home – I was eighteen – this independence thing. [I studied] public administration and industrial psychology, [got] a part time job in a consultancy firm when I was doing my master's. That went on for a couple of years. [Now] I am studying full time. The real reason I'm doing [a PhD], it's personal, and then it's like a family pride thing, and then hopefully I will get a job that recognises my investment in education. But actually if you want to be a consultant [you] must have a PhD. I'd like to be self-employed, to give me freedom. I want some more control over my life. I was going to be a businesswoman [but] I found myself pushed towards academia. I didn't appreciate this marvelous opportunity and a family that really cares. Because of my cling to independence, I didn't apply for any bursary. I get the occasional project, I go and do a project for three months, get some money and come back and study. I've accepted that's the way of life. (WPT01)*

Part of her motivation for studying is to "make a contribution":

> *I want to see how Johannesburg raises its revenue… a study in public financial management… It's important because, the studies that have been done on the African continent don't look at it like that, don't look at the city management. They look at property tax, they look at one aspect... What I am hoping [is] to make a contribution from an African perspective… a study that will come from within, not consultants coming to find out and having a checklist for us and going back and telling… Have a real study that was done from within. (WPT01:193,239)*

In the examples of these two younger PhD people we see similar concerns to those more established in their careers. They are driven by curiosity and a desire for knowledge relevant to their work and there is a strong internal motivation to study.

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1 CMT08:28
2 CMT08:56
3 CMT08:60

The PhD and non-academic work

The stories above illustrate how diverse the lives are of PhD people who work outside of the university sector, but they also indicate some commonalities. These people share a quest for knowledge – to deepen or broaden their knowledge base, to bring their knowledge up to date, to gain new insights or to develop their understanding of aspects of their work. However, they are focused on knowledge that is relevant to their work. They want to apply what they learn, or to see it applied. The results of their research are needed for a project or to inform decisions in the workplace. Many work in research positions and may have substantial experience of research before starting the PhD or their work draws on research to make informed decisions or to solve problems.

But the PhD is also a personal goal. It brings personal satisfaction, confers status and is a source of family pride. Or they do it because they are bored and want a challenge. Sometimes the PhD heralds a change of direction, into a new kind of work or a new knowledge domain. A PhD improves one's job prospects. Sometimes there is direct pressure from an employer, or an indication from prospective customers that a PhD is desirable; but even without external pressures, a PhD declares them to be an expert, or gives them an edge over others in a competitive workplace. Some are overtly motivated by making money, but that is less commonly voiced than the desire to do a good or better job. In all cases, these people are not interested in, and do not equate the PhD with an academic career.

People who pursue academic careers

The second significant cluster of people who embark on PhDs in South Africa are those who work in the university sector. And again this cluster can be considered in two groups – those more established in their careers and those who are embarking on them. The former work in teaching positions in universities, but for one or other reason, are completing their PhDs later in life. Those starting out on academic careers are more likely to be anticipating academic research careers.

Established academics

As we saw in chapter two, many staff at universities in South Africa and sub-Saharan Africa do not have PhDs and are under pressure to improve their qualifications. There is thus a significant group of staff within the higher education sector, who want to get PhD degrees when they are in their thirties, forties or even later. These people have established lecturing careers and their

interest lies in teaching. A South African woman says, "What I do is I teach mathematics at university. That's what I do, that's what I am"[1] and this man says:

> *I was trained at first as a teacher – I did Bachelor of Education Sciences – so that perhaps also has some influence. Again I like teaching, ja. So I wouldn't say specifically that I had planned to have a PhD, but maybe because of… the interest in the career of teaching and the university has also influenced me to… go for further studies. (CMT14:39)*

These people see the PhD as enhancing their teaching. Having a PhD contributes to "your own sense of confidence in front of students."[2] It enhances your skills: "I've done my studies in mathematics education in order to make me a better lecturer of mathematics at university"[3] or gives you license to undertake new teaching roles: "I'm already an academic in the field and I need to contribute to the development of my university by supervising master's students and if I only have a master's, then it becomes difficult for me to supervise other students."[4] They are concerned with how their research relates to their teaching practice. One lecturer asks of his thesis topic, "how is this going to enrich second language learners in a university situation?"[5] And the teaching becomes a resource for their research:

> *It's a very symbiotic thing. A lot of the stuff that I teach goes into the PhD. You know, I'll suddenly have this breakthrough – "Whoa, somebody in the renaissance did such-and-such, let me see whether that has an implication?" And I teach a course in structures – first-year – so that's an obvious link. … I have been teaching, project management and contracts and so on, and that fits into it. But right at the moment it's all very closely linked, it all meshes together – very closely tied. (WCT02:67)*

Most of them are under pressure from their employers to complete PhDs. One man says, "I went back to the university and after that, they needed us to do the PhD, because I was in academic circles then"[6] and another, "if you don't have a PhD you don't really get a tenure position."[7] This man is more blunt, "to be brutally honest, it's necessary for promotion."[8] A senior academic in a professional discipline says that few people in her department have PhDs,

1 CMT23:119
2 KEI06:22
3 CMT23:119
4 WCI06:31-35
5 KEI04:13
6 WCI06:31
7 CMI07:15
8 KEI04:20

"but our head of school, now is really pushing for all of us to move on to the next step."[1] There appears to be a general upwards shift in qualification levels in the professional disciplines, as she explains:

> *One thing that is changing now is that our whole course structure… When I finished my professional qualification, it was a bachelors. That exact same degree is now a master's… and I think simply by doing that, a lot more people are going to be prompted into doing PhDs. Because in my generation quite a lot of us went and did master's, so we became specialized. So we had an edge on the rest of our colleagues by doing the master's thing. Now that everybody's popping up to a master's, I can see that the people [on] the top of the pile are probably going to be looking to doing PhDs. But certainly in this country, a PhD is extremely rare. (WCI02:79)*

But they also study for personal fulfillment, for a sense of their own self-worth.

> *Before I came here I was actually part of the Mathematics department at University of _____ and generally the trend is that if you don't have a PhD you don't really get a tenure position. So it's on one side a motivation. On the other side, personally I think I wanted to at the end of the day be fulfilled that I actually had done something, ah, worth giving me a position as a teacher at university level (CMI07:15)*

Some people drift into the PhD as the next step after completing a master's saying, "I didn't really know at the stage of my master's, what to do with my life"[2] and …

> *I guess it was simply inertia because I started here as an undergrad student, got an FRD[3] bursary to do a master's degree, and then after completing my master's degree, I found the subject interesting, so I just continued into a PhD. (CMI11:15)*

For those in the pure disciplines, there is greater acknowledgement of the need to do research and a PhD teaches you research techniques and exposes you to the field. When asked if it's important for a mathematician to have a PhD, this person answers:

> *I think it would be difficult to carry on without a PhD because, during your PhD that's when you are exposed to research and you get to know how you can contribute to the field. I think you*

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1 WCI02:87
2 KEI03:42
3 Foundation for Research and Development, the forerunner of the current National Research Foundation (NRF).

> *can proceed doing mathematics without a PhD but I think your research techniques will be disadvantaged, yes. So you will be following what people have done, instead of actually coming up with your own things. (CMI02:28)*

Many people who do academic work display a love of learning: "I've always had this… I mean I'm a bibliophile, a linguaphile, all of those things. I love languages. I enjoy learning things, so it was just a natural step from the master's I guess."[1] They speak of their enjoyment of the process of learning, saying, "the interest of learning in my life has been increasingly becoming important."[2] Others are more ambivalent about the value of research. This lecturer questions the value of academic research in English studies and the manner in which it is carried out.

> *I have had a... I think quite a... I don't know what the word is... a negative attitude in some ways, towards English studies research. I feel it reaches too few people. I have often felt that literary criticism is such an elitist activity that it doesn't actually reach anybody, while a few academics who are in competition with each other and will then try and shoot you down in flames. That seems to be the kind of modus operandi of English research in English studies – pure. (KEI04:13)*

Academic staff at many African universities may set out with research careers in mind but face challenges which delay further study. For many, there is little opportunity to complete a PhD at the institution at which they work. There may be no-one qualified to supervise, "I joined the University of _____ as a lecturer, but I really wanted to continue with my thesis, PhD level, but I couldn't get supervision at the University of _____"[3]; or those that are qualified may not be involved in current research, "I couldn't do that in _____, well I could, but there was not sufficient supervision, because most people who were interested in the same area were not actually publishing anything."[4] And even when there are suitable supervisors available, it is sometimes better to study elsewhere. One man explained that "quite a lot of colleagues encouraged me to do my PhD there, but having been in the department – and I know almost everybody – I decided that, let me not do it there, but somewhere else."[5]

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1 KEI11:6
2 CMI01:39
3 CMI06:7
4 CMI07:7
5 WPI01:30

When looking for opportunities for doctoral study, South Africa is an obvious choice because "the universities have a really good reputation"[1] and are relatively more accessible in terms of distance and cost. It also offers an appropriate context in which to pursue knowledge related to Africa. A lecturer in wildlife ecology and ecosystem management who is studying the impact of climate change on grazing says, "I wanted actually to do my studies within Africa"[2] rather than in America because "the ecological environment would be … different from the ones that we have here."[3]

But studying in another country incurs costs for living expenses and the higher fees charged to international students. The process of finding funding causes delays, "so since then I've been trying, applying, trying to get funding to go abroad"[4] that may run to years.

> *I come from [central African country]. I was trying to search for opportunities to do a PhD. … I got a response from Dr. _____, then I started communicating with him. I was at a later stage invited to come here so that we could discuss. At that time I didn't have any funding opportunities. And then I came here and started discussing with him and there wasn't any immediate opportunity that could allow me to come and study. So that was in 2006. Then I was just trying this and that way and I couldn't succeed. Now at a later stage again, October 2006, I was written an e-mail indicating that there was an opportunity for NRF funding. … Then we started again communicating, but I couldn't report as quickly because of some other international procedures - like I had to get a study permit and this and that. But later on things worked out OK and then I reported here in 2007. (CMI01:7)*

And it may require some ingenuity and extra work…

> *The other difficult part was of course financing. Being a foreign student and not having sufficient support from my government, I had to rely on the local scholarships and bursaries. And for a foreign student it's not very easy to actually get these bursaries. So that was a bit of a challenge as well. … I have done some tutoring. I was actually able to teach a course as well, so that kept me going for a while. (CMI07:68,76)*

There are other reasons why people in academic positions delay getting PhDs. Some delay for family reasons as this woman explains.

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1 WPI08:15
2 CMT14:23
3 CMT14:51
4 CMI06:7

> *I married someone who was doing a PhD at the time we got married and I said, "well fine, I think it's a bad idea that we're both doing post-grad, simultaneously." He then took sixteen years to complete his PhD, so I started my master's when, you know, sixteen years after he graduated. Then you know, teaching and so on full-time meant that master's took a few years longer than anticipated and yeah, so here I am. (WCI02:15)*

And others become caught up with heavy teaching loads. A lecturer teaching language skills finds a "greater and greater need for basic English skills courses"[1] and as a result he says that he has "been overwhelmed by teaching. I used to teach between 16 and 20 contacts a week at _____, so it really was not conducive to doing a heck of a lot of research."[2] And another lecturer who has spent twelve years working towards a PhD explains how the work creeps up on you:

> *When you start being a postgrad student, you're encouraged to be a tutor, and then… I was offered a short lecturing job. So I started lecturing and enjoyed it very much. So when they said, "the students like you, can you carry on next year?" I just said, "Yes!" And that got me involved in lecturing, which was fine in the beginning because it was just one course… but then, I just got more and more involved… There was a fellow PhD student who got more and more involved in the lecturing side of things and in fact he was partly responsible for revolutionalising the way the tutorials were done in the department - that's how deeply involved he got. Needless to say, he never finished his PhD. I should have taken that as fair warning. (CMT16:31)*

Those in more senior positions may also have administrative responsibilities such as, "I've got quite an admin load as well, because I'm assistant dean at the moment, so that also adds to it."[3] And this lecturer who says,

> *…for that period I was actually a full-time lecturer in the department and, in fact because I was also contracted to be the Linux sys admin, it was equivalent to a job and a half. No progress was done on any research during that period. (CMT16:23)*

Others simply don't feel ready to do a PhD. "I was encouraged to begin my PhD and I just didn't feel ready, to be honest. I hadn't discovered any area of such a great interest that it would sustain me for three, four, five years."[4]

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1 KET11:12
2 KET11:12
3 WCT02:223
4 KEI04:12

Those who combine their PhD studies with full-time academic posts are tenacious. One says, "It is something I feel that I started and didn't complete, so that is also something that bugs me. It's not something I want to let go."[1] Another who has been working on his PhD for 12 years says, "I kept working on my thesis, even if sometimes it was an hour a week only, and I think it was just sheer stubbornness, I suppose – that as long as I had the work and I was able to get results, I just kept going."[2]

Most who are in academic jobs plan to continue in them. However, foreign African academics expressed concern about continuing with research once they returned to their home universities. For those who have experienced the excitement of research in better equipped environments, it is difficult to contemplate a return to institutions which have heavy teaching workloads and lack an active research community and funds for research. This lecturer, discussing whether he will return to his home country says,

> *…if I am to go there right now, with the shortage of staff, the focus will all be on teaching because of overloaded, so the research side would suffer, definitely. So I would rather, maybe hang around a bit, doing some research – as a post-doc perhaps – developing my research side so that if the situation improves at home then I can go there… I see myself ending up in the University of _____ sometime, but maybe not in the near future, also depending on the opportunities this side. (CMI06:51-55)*

Another, when asked if he will return to his lecturing post says,

> *I have been thinking a lot about that because I'm writing up my thesis now. Ah, ultimately I want to go back home. Whether its immediately or in a few years time, is a different story – mainly because there is very little funding for research in this area. And going back home right away after my PhD would put me back into just teaching and not research. So I would really want to be in a position where I've gained some skills in research, I have contacts around – probably a few collaborators I could work with – and then go back home and see if I could start an active group there - with these contacts around the world. So, generally that's what I've been thinking about. (CMI07:23)*

Many established academics are interested in the PhD because it enhances their teaching and their status in the university and gives them access to promotions. There are a range of factors

[1] KEI04:20
[2] CMT16:35

that delay people getting PhDs including family and work circumstances and access to funds. While most of the mid-career academics see themselves primarily as academic teachers, some are interested in building research careers alongside their teaching.

Early-career academic researcher

Now we come to the group of people who have moved continuously from school through undergraduate and master's studies, directly into the PhD and are, for the most part, planning to continue in academic research careers. In this group I include people who may have spent one or two years securing funding, working, or otherwise outside of formal studies, but on the whole their academic trajectories had been uninterrupted. The following story is illustrative.

> *I'm originally from Switzerland. I wanted to study marine biology, so I had to study somewhere else. I did some volunteer work [in South Africa] and I liked it so I decided to come here. I did my BSc with zoology and oceanography and I did some maths courses. Then did my honours doing zoology with one project in applied mathematics, then decided to do my master's and then just went after my PhD now. (CMT19)*

When asked whether they will pursue academic careers these people say things like, "Probably. I don't really see I can do very much else and I think I'd probably prefer academia."[1] However, their interest is less in the teaching role than in the research role. A person who is employed in a research institute within the university, when asked "Will you stay in academia?" replies,

> *Well as much as this is academia. I mean the fact that it's applied and we get contracted by outside people. … It's very much research. So yeah, I can't see myself being full-time lecturer type of person, but definitely I would like to stay in this field, in the field of research, and do research. (CMI04:31-35)*

For an academic research career, a PhD is required, "It's definitely something that, I mean in this field, I think a PhD is something that's kind of required or expected if you want to go further."[2] But this requirement is not the only reason they study. It is still the interest in the subject that makes them continue with their studies.

> *Once I got to a BSc and I realised I wanted to go into relativity or something, I knew I had to go for a PhD in the end. If I wanted to become an academic, you need a PhD, at least. And I*

[1] CMI13:39
[2] CMI04:27

> *found it interesting, I mean, that's one of the main reasons why I continued, I liked to study. I didn't actually go for the qualification, so to speak. (CMI08:15)*

In this vein, another student responded to the question "Why do you want to get a PhD?" with, "What else is there to do?"[1] She went on to explain that

> *I don't really think you can actually do anything interesting in theoretical physics or anything really theoretical without having a PhD first. I mean, with things that are more practical, I guess you can leave after say, your master's and you can go out and get a job and you can do stuff with that. But very theory-ish things…(CMI13:31)*

Some of them have known from an early age that they would pursue a PhD, "I always had an ambition to get a doctorate."[2] But for others this realization comes later in life, "When I left high school I wasn't clear, but when I went to the university I started seeing that I can be a mathematician, because my strengths were more in mathematics than in the other subjects."[3] And some continue to the PhD because they find themselves ill qualified for anything else,

> *It's pretty much been, the reason why I did the PhD was, I became interested in the transatlantic African-American / South African idea around the end of master's and I thought, well, since … with a master's in English your range of options is not as wonderful as it's represented in those career brochures or English departments. So I thought … why not just see if I can follow the whole process through? So it was partly just following the whole process through, because I've been studying since the day I left school. I have not had a break. (KET12:42)*

For those in the mathematics case study, a post-doc is the next step in their academic careers – "I would like to do a post-doc, so it depends on where… they have space for me and where I can get accepted"[4] and preferably in another country, "I am still thinking about that because I might need another experience, maybe in Europe or America, maybe I would want to go for post-doc."[5]

For some it takes time to establish that they want to work in the academic environment. For this young contract lecturer her initial involvement in teaching was almost reluctant.

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1 CMI13:27
2 CMI05:11
3 CMI02:22
4 CMI14:59-63
5 CMI02:114

> *I set out to be a journalist of course. But after three years of journalism, I just decided, I don't have the cut-throat attitude that I think you need, to be a journalist. … So at a loss at what to do, and not wanting to go into the real world yet, I decided "Ooh, English Honours looks like a good idea. I'll just lark about for another year." That's where I was introduced to tutoring - in English Honours - and enjoyed it. (KET01:20)*

She has now made peace with her academic identity. She says, "once I got back into the academic... I realised I was a nerd, at heart, and I love to study, and that's the environment where I feel I flourish."[1] Others also have doubts about working in the university sector. One man who has managed his research career assiduously, says,

> *It's at a very difficult phase because as I say, I've always had this as a goal that I've wanted and I've enjoyed doing it so far, but it's reaching the point where I'm trying to now decide between going into the commercial side of things and staying in pure research and I suppose with age you get slightly more disillusioned with the allure of academia. (CMI05:23)*

For young people who have excelled in their fields, funding is easier to come by than for other PhD people. For example one of the younger mathematicians says, "I've got an NRF bursary, so I'm fine for this year. I do a bit of tutoring also, but I would be fine with just the NRF actually."[2] A colleague left school with no clear career goal, but found himself excelling in mathematics during his undergraduate studies and was offered a scholarship.[3] And a younger South African in English Studies applied unsuccessfully for a number of bursaries until he "got a fellowship finally, at this university… plus three years of NRF doctoral money, which has been wonderful."[4]

People in this group value knowledge. They say things like: "Before I even started at university I always had this idea that I'd like to do a PhD. I like the way the PhDs really do extend the boundaries of knowledge and so on, and for me that was always a dream"[5]; and "When I was very little, like from the age of about four or five, I wanted to know as much as I could. … I had a real thirst for knowledge and I thought somehow, at that stage, that having a doctorate equals knowing."[6]

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1 KET01:20
2 CMI13:287
3 CMT08:6,22
4 KET12:22
5 WCI02:7
6 CMI05:19

This group of PhD people are young, driven by curiosity and a passion for their research, they have moved quickly from undergraduate through to postgraduate studies, usually in one field of knowledge, and are set on working as academic researchers. They accept that teaching will be part of their academic responsibilities, but it is not a significant driver for their choice of career.

The PhD and the academic career

Like their counterparts who work outside of the university, it is common for those pursuing academic careers to identify knowledge generation as their major goal in doing the PhD. They are interested in knowledge and knowing, often with a focus in knowledge itself, rather than knowledge for some other end. They also study in order to enhance their careers or to enable them to pursue academic careers.

Despite the Humboldtian tradition which holds that teaching and research should be interwoven in the university, there appears to be a dichotomy between those who focus on teaching and those whose focus is research. Academic teachers often delay their PhDs either because circumstances prevent them studying or because they do not feel it is necessary. When they do study, the PhD is about enhancing their teaching or improving their career prospects by moving into the more highly valued research activities. On the other hand the younger people who are heading for research careers undertake the PhD in order to learn research skills, and to establish their research record and collaborations.

Career nomads

The final group was of people who moved between work in and outside of the university. They saw themselves as both academics and practitioners at different times in their lives. This group was more varied than the other two and included some who worked outside the academy, but aspired to academic positions; some who worked at universities because they had been unable to find work in their chosen profession and those who made one or more deliberate switches between different kinds of work during their lives.

For example, here is the story of a man who is pushed by national political events out of university work into the NGO sector, and finds his way back to the university.

> *I started at university, I like research, so I was a researcher at different places for many years. As the country went through transition an opportunity came for the ANC to rethink its foreign policy and for that they collected a group of academics and activists and I was very*

> *fortunate and privileged to be part of that. As a consequence, some donor money came to establish a foreign policy think-tank. I became research director there. The next step would be to get a PhD. I also realised I had to go to an academic institution to complete a PhD because it needs to be grounded in theory. At some point I realised that maybe I should just continue with my academic career instead of going back. I'm drawn to the academic world. (WPT03)*

For others, the PhD comes in anticipation of a transition in their lives and serves to facilitate a shift in direction. A man with a long and successful career in the private and public sectors, anticipates doing academic teaching work on retirement. He grew up in "quite a notorious area" and would like to return there to "show the youth it's never too late."[1]

> *In four years time I'll be sixty and will have acquired my PhD. And I'm hoping to return and spend part time in lecturing and share the experience with the students out there. Because I feel there's a lot that I could share with them – both practical and theoretical – because of my exposure and experience. (WPT10:44).*

And for a mother of two small children, who has worked extensively in the private sector and is now consulting from home, the PhD allows her choices and the prospect of more flexible work while she raises her children.

> *I have enjoyed the consulting so far, but I think once they're bigger and more settled at school, I can probably... I actually don't know, it depends… I may get into academia or continue with the consulting or find a half-day job. What I do know is that, financially permitting, I don't want to go into a full-day, full-time job. And that's one of the main reasons why I did a PhD, was to give me that kind of edge. (WPT09:401)*

But for some the shifts between academic and other work are less voluntary. This man has been trying to get into the engineering profession but keeps finding himself back in teaching positions.

> *[I am] from Ghana. In '83 I had to do some national service, teaching in a primary school. I have had two years [industry experience] in Ghana. When I came to Swaziland in '91, I thought I would get some engineering job. I ended up teaching again in a high school. I moved into South Africa in '93 thinking I'll get an engineering job. I ended up teaching again. If you look at the history of the country, looking for an engineering job, it was pretty tough. (WCT06)*

[1] WPT10:32

He now has an academic post, but says that he plans to move into industry after his PhD.[1]

A woman who has worked in the police force and the media and held a number of contract positions in the university found her path to an academic career blocked when an institutional merger meant that "there were no posts available." She says that "had there been a post available, I think I would have applied and gone there and I would have still been there now today and I would have loved to have been there."[2] She now works in the private sector and admits that "one of the reasons I took this job was because, with two children now who are heading off to schools, we actually need a viable living income and I can't make that income simply through working academically."[3]

Others study because they cannot find employment. One South African man worked as a cashier in a filling station, before completing a Bachelor of Arts and a Diploma in Public Management.[4] He then does short-term administrative jobs for the university[5] and completes his master's. He enrolls for the PhD after spending "two years not having anything to do."[6] Another man, also a South African, explains that he was ill advised during his initial studies and this hampered his attempts to find work.

> *And I felt that then there was no hope for a job … there was not a big scope in terms of lecturers informing us of what we can do. It was only late that I came to know that you could have also done psychometrics and that could have helped you to get a job. But it was a bit tough and then I joined an NGO with the hope that I would get somebody to supervise me on psychometrics. But unfortunately it didn't materialize. (WPT04:15)*

For these two individuals, their persistence in further study pays off. The first eventually secures a doctoral internship at the Human Sciences Research Council (HSRC)[7] and hopes that the PhD might lead him to a lecturing position.[8] The second graduates with a master's in psychology, and is self-employed as a clinical psychologist.[9]

1 WCT06:63
2 KET02:34
3 KET02:148
4 WPT11:12,16
5 WPT11:20
6 WPT11:26
7 WPT11:34-38
8 WPT11:62
9 WPT04:27

The career nomads also learn for the love of it, "English clearly is my major love and I really enjoyed it."[1] For them, the PhD serves to consolidate what they have learned in a variety of work situations and to ground their knowledge in theory. But it also serves a practical role in making them more employable across a range of different work environments. Given the demand for high-level skills in all sectors of the South African economy, and the increasing number of people who view themselves as highly mobile knowledge workers, it is likely that the number of PhD people whose careers follow this nomadic pattern will increase.

5.3 Why people do PhDs

Why do you want to get a PhD?

> *I think it can open doors for me in the future and I just like research as well. I want to make a contribution to the field of mathematics because that's what I've been doing all my life now and I just want to contribute. (CMI02:20)*

This response includes several of the reasons that people pursue doctoral studies. This person wants a PhD because "it can open doors"; because "I just like research" and because "I want to make a contribution." He also hints that, "that's what I've been doing all my life now." In the discussion above, I examined the different kinds of people who undertake the PhD and looked at the reasons they embark on their studies. Here I consolidate those reasons across the five types of people.

Table 5.1: Why do you want to get a PhD?

- To upgrade my knowledge
- I want to make a contribution to the field
- I think it can open doors for me
- It is necessary for promotion
- I just like research
- I enjoy learning things
- That was always a dream
- I guess it was simply inertia
- I spent almost two years not having anything to do

The most common reason for doing a PhD is the quest for knowledge. Almost without exception, those interviewed identified the pursuit of knowledge as one of their reasons for doing a PhD, both increasing their personal store of knowledge (knowing more) and increasing the sum of human knowledge (generating knowledge). People study because they want to understand situations or problems, they look for solutions or for information that will lead to better, new or different understandings. They pursue knowledge that will help them to do their work better or will inform decisions that they need to make. They speak of making a

[1] KEI12: 22

contribution to knowledge or using knowledge to make a contribution to their profession, discipline, place of employment or to society at large. There were, however, different understandings of the kinds of knowledge that would result from the PhD, which I discuss in chapter eight.

The second most often cited reason was to improve one's career prospects. People who are employed as academics study because they are under pressure from their departmental heads, or institutions to get the PhD. Without a PhD the avenues for promotion within the university are limited. For those outside the university, while the PhD is not necessary, it does have career benefits. With a PhD one can access more and more challenging work and set oneself apart in a competitive market. For those who move across employment sectors, the PhD also ensures that academic work is an option.

Many spoke of studying for their own personal satisfaction and sense of self-worth. The PhD is an object of childhood fantasy, with people saying that they "always dreamed" of being a doctor.[1] They were told by respected adults that they "must be a doctor"[2] or they conceive of the PhD as the means to fulfil their childhood ambition to know everything. They study "for personal reasons," because they have the opportunity, or because they want to be worthy of their academic positions. Some study because they "love learning" or they "enjoy doing research." These people are excited about the processes of learning and research and find satisfaction in the discovery or unfolding of knowledge. They take pleasure in their own growing sense of mastery and get absorbed in the tasks of reading, writing, thinking and arguing. Others stumble into PhDs because they don't know what else to do. They drift from undergraduate degrees into master's and then go on to a PhD because it seems like the next logical step. And a few struggle to find employment so they study to avoid boredom.

What was clear from the interviews is that those who pursue doctoral studies seldom do so for a single reason. Most could readily enumerate two or three reasons when asked directly and other reasons became apparent in the course of the interviews. It was rare for anyone to reflect less than three reasons for studying. This suggests that doing a PhD is not a straightforward decision. Rather it is an accumulation of different influences, circumstances and opportunities.

1 WCI02:7; WCI04:23; CMI05:11,19
2 KET07:24

According to the literature, people enter doctoral studies for many different reasons including: scholars who were interested in their subject and desired an academic career, those looking for better career prospects and drifters who like university life (Hirsh 1982:198). But some studies are at odds with my findings. In the USA, a 1999 survey of doctoral students found that "the vast majority of students enter a doctoral program with a faculty career in mind" (Golde & Dore 2001:6), which was clearly not the case in this study. However, there were some parallels. Golde found that "students are motivated in their career aspirations by a love of teaching, enjoyment of research, and interest in doing service" and were concerned about "onerous workload expectations and low salaries" in academic careers (Golde & Dore 2001:9), positions that were echoed by the PhD people in my study.

Those doing PhDs in mathematics and applied mathematics or English studies expressed more interest in academic careers; with those in civil and environmental engineering, and public and development management expressing less. These observations parallel the findings of Golde and Doore, who found that, "Students in the humanities, history, and mathematics have the strongest interest in becoming faculty members. Students in the disciplines with strong connections to industry are the least interested in faculty careers." (Golde & Dore 2001:6). While the USA suffers from a surfeit of doctoral graduates so that those seeking academic careers are unlikely to find them (Golde & Dore 2001:6), in Europe there is "a general decline of interest in such qualifications among graduates, who view them increasingly as strictly necessary only for an academic career" (Sadlak 2004:10). However, Europe is not homogenous and in some countries, like Germany and Austria, the PhD is valued highly in business and in the civil services. Thus we find comments like, "The popularity of Doctoral studies is mainly to be found in the great prestige of academic degrees in Austria. It may not always be accompanied by a strong interest in academic research" (Pechar & Thomas 2004:20).

Blume, writing in 1986, spoke of student demand "forcing a new instrumentalism upon the universities" (Blume 1986:219), but this is less evident at the level of doctoral education where people are less driven by financial rewards. A study in the USA concluded that those who want to make money "stop after the Bachelor's degree or enroll in MBA programmes or go to Law School specializing in the lucrative sides of a law career, or attend medical school," whereas PhD graduates want "intellectually challenging employment, with a high degree of autonomy" and they want to "apply their scholarly training for work that solves real problems in the world." They seek employment that meets these criteria both in and out of academia (Nerad 2004:197).

This is consistent with the perspectives of the doctoral people interviewed for this study. Although the economic value of the PhD is not lost on them, they value doctoral education because it gives them a high degree of control over their working lives and enables them to undertake interesting and challenging work that contributes to society or to their field.

But there is little appreciation of this range of motives among university administrators and academics because "for them, the main purpose of doctoral training is still to produce the next generation of faculty" (Nerad 2004:190). For example when PhD people in the USA complained that they were ill informed about employment opportunities outside of academia, campus career centres were established to provide information about "alternative" or "other" careers, reproducing and reinforcing the idea that the academic career is the norm (Nerad 2004:187,191). Those who intended to pursue non-academic careers "experienced apprehension in articulating their actual career goals" and "told vivid stories, even 10 years later, about encountering unsupportive climates in their programs towards students who had career goals other than the professoriate" (Nerad 2004:190).

Self-reflection

When compiling the PhD stories, I also undertook to compile my own to see if I could satisfactorily express, in the 200 words that I had allowed, my own journey to the PhD. I found it extraordinarily difficult. This would seem to be an appropriate point to recount my story.

My own 'short story' **March 2008**

I had a single-minded ambition to be a mathematician, completed master's and began a PhD. The research grant was at UCT, I lived in Durban. My husband refused to move and I went alone to Cape Town. Eighteen months into that PhD I was pregnant and moved to Johannesburg (where my husband now lived). I found a lecturing job at Wits, was put on a "teaching track" - "now that you have a child" and had no time to complete the PhD. Faced with working in academia without a PhD, and by now divorced, I opted for IT[1] and money. I worked my way through technical positions to management and completed an MBA, studying online late at night while my son slept. IT was exciting, but exhausting and morally questionable. I left after successfully implementing a system that put 300 people out of work. Back to lecturing and appointed head of the School of IT at Monash's new Johannesburg campus, I saw a future in applying my management skills in higher education. But again, not having a PhD was an obstacle. I got a fellowship for full-time study and enrolled the same year that my son completed high school.

[1] Information technology

I undertook my first attempt at a PhD because it was the next logical step in becoming a mathematician (and I secretly believed that mathematics would reveal the truth about everything). My second attempt was for more pragmatic career reasons, although my early romanticism about knowledge and urge to know more persists.

5.4 The intersecting contexts of the PhD person

The stories which PhD people tell about their lives and work experience make it clear that a number of contextual issues, including family, work experience and working environments influence whether, when and how they undertake doctoral studies.

McAlpine and Norton have proposed a model of *nested contexts* which influence retention and completion of doctoral studies. Their model places the "student and supervisor-in-relationship" at the centre of a number of concentric circles representing in order, the departmental/disciplinary context, the institutional context and the societal/supra-societal context (McAlpine & Norton 2006). This model, they suggest, should be viewed as a "heuristic, a visual image that serves as a mnemonic by providing a simplified representation of complex dynamic systems in an integrative fashion" (McAlpine & Norton 2006:6). Although their research looked specifically at the question of retention and completion, this model has wider application to research in doctoral education and creates a framework that can be "used to (a) situate and critique studies, (b) analyse new trends and potential changes in practices and policies and (c) generate research questions"(McAlpine & Norton 2006:12).

They suggest that the nested contexts framework serves to "remind us to consider contexts not presently in our focal area" (McAlpine & Norton 2006:5-6), but their framework does not remind us of other contexts which are important to doctoral people in South Africa. In particular, it pays too little attention to the contexts outside of the university. The important role which other workplaces and family contexts play is not adequately reflected in the societal/supra-societal context, particularly since they say that the nested nature of the contexts implies that "there is more immediate influence between close contexts and less immediate influence between contexts further apart" (McAlpine & Norton 2006:6). For someone whose doctoral research is based in their workplace, that workplace might have a far more immediate influence on their doctoral studies than the university department with which they have infrequent contact.

The PhD people in this study sit at the intersection of many contexts including the department in which they study, the discipline in which their research is located, the place where they work (which may be a university department), and their family and friends or other groups to which they are affiliated. Because research shows that doctoral education may differ significantly by supervisor (Dietz et al. 2006:69), it may also be necessary to include the relationship with the supervisor as a separate context. Which suggests the framework of intersecting contexts in figure 5.1. In this framework each context is represented by an oval which is bigger if the person engages more with the context and smaller if they engage less.

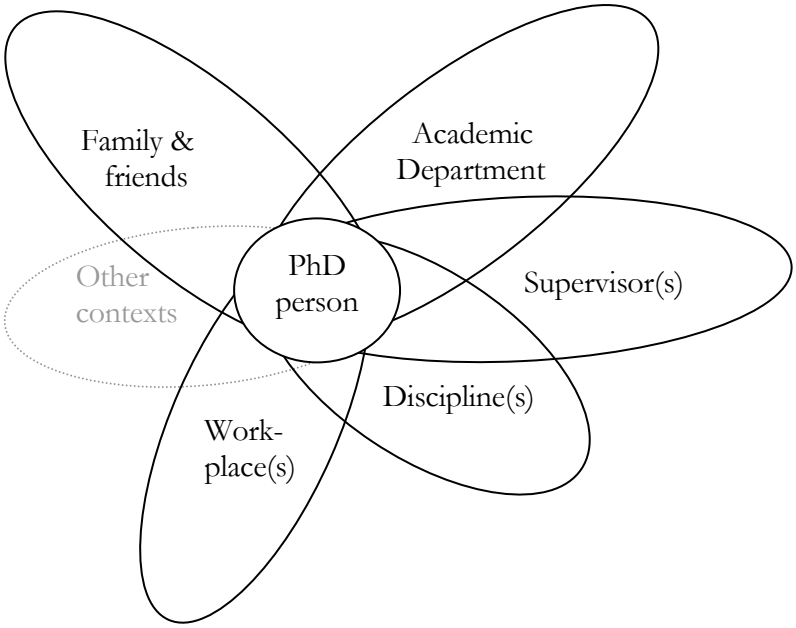

Figure 5.1: The intersecting contexts of doctoral education

While all PhD people encounter contexts of the department in which they study, the relationship with their supervisor and the discipline in which their research is situated, there are other contexts specific to different types of students. For people who work outside of the university their places of work and possibly their professions are relevant contexts. A mid-career academic teacher also has to consider the department in which she or he teaches. For those who study across disciplines there may be two or more disciplines to contend with and PhD people are also members of families and other affiliation groups. This list of contexts is of course, not exhaustive. For each PhD person, a particular configuration of contexts will be relevant and the relative importance of the context can be indicated by larger or smaller areas. Support for this use of contexts to model doctoral education comes from Boud and Lee's work which suggests

that the environment of study should mean the experienced environment of the students – "how they perceived and indeed constituted their environment" (Boud & Lee 2005:505).

This intersecting contexts framework calls to mind the model of "the hybrid curriculum of the professional doctorate" (Lee et al. 2000:127) that "has become a reference point in any discussion about the frameworks for professional doctorates in Australia" (Malfroy 2005b:25). Lee, Green and Brennan's model considers the kinds of knowledge and ways of producing knowledge that can be expected at the intersection of university, profession and workplace. It appears that in South Africa the research PhD accommodates a range of people who, in other parts of the world, might pursue different degree programmes, including the traditional PhD, the professional doctorate and what has been termed the "generic professional doctorate" (Boud & Tennant 2006:296). So my model reflects other models of doctoral education that are in use, but is more appropriate for the South African context, drawing attention to the full range of contexts which doctoral people encounter.

Here I consider the ways in which the different contexts value the PhD, encourage doctoral study and enable or constrain future plans. In chapter seven I will explore how the contexts facilitate and hinder PhD studies.

The context of the (non-university) workplace

The context of the workplace dominates the lives of established professionals and practitioners. It is the occasional home of career nomads and the space that the young people who plan on careers outside of academia aspire to. Those in or planning academic careers make mention of the workplace only to dismiss it, like the young mathematician who says, "a real job would probably be very stressful and have parts of it that were very dull and I probably wouldn't enjoy it".[1] Academics may spend short spells working in other environments, but they are considered insignificant in their careers.[2] There are of course many, varied workplaces other than the university. People work in the private sector, the public sector and the NGO sector; they work for large organisations or small consultancies, and each has different ways of valuing the PhD and enabling or constraining future plans.

In some workplaces, the knowledge that will result from the PhD is valued. People research in areas related to their work: one is doing research that will facilitate "implementing the new

1 CMI13:39
2 WCI02:71; WCI06:31; KEI06:10

Water Act"[1] and another is using her research to inform her implementation of biodiversity legislation.[2] One woman says of her research that "a lot of people are really keen to get the results."[3] But knowledge may be valued differently in different departments of the same workplace as this woman who works in the public sector explains.

> *We are broken up into two sections. Our specialist unit, which is our conservation guys, in there we've got the flora specialist, the mammal specialist, and things like that. They hold PhDs and they're doctors and absolute specialists in what they do. In the section where I work where we assess applications, make reviews, do monitoring and so on. There's a couple of the staff are now motivated to get their master's, but none of them hold a PhD. (WCT09:43)*

For those who plan to work as consultants in the development and NGO sectors, the PhD is important in getting contracts[4] and helps to position them as experts: "I intend to position myself as a development consultant. So, by focusing on one issue within development, I thought the PhD would add value to my career - I could then be an authority on a certain aspect of development."[5] But for others, it has little bearing on their future work. In fact a PhD might make it more difficult to get work as this engineer suggests:

> *If you go out into the working industry, you find that your PhD is posted at a higher level, but at the same time, that means that people are not very comfortable with hiring you at the lower level and so your chances of finding jobs outside academia are much more reduced. (WCI06:175)*

The context of work is enjoyable because it involves practical work and the application of knowledge "I've quite enjoyed being out in the field and practicing what I've learned and learning more from a hands-on approach."[6] People find their work satisfying[7] and energizing.[8] This woman explains why she resists attempts by her supervisor to get her to study full time.

> *My supervisor's been really trying to get me to swap to full-time… You know, I enjoy being able to work in the field and I spend a lot of my time on-site and in the field, and imparting knowledge on guys, whether they want it or not. And that's quite nice, it's bringing in the*

1 WCI10:19
2 WPI07:41
3 WCI04:279
4 WPI10:49
5 WPT07:27
6 WCI04:39
7 KEI07:146
8 KEI12:140

> *practical and theoretical together, which I quite enjoy. I don't think I would cope very well if I had to just sit and do it full-time. (WCI04:247-251)*

Some people find their workplaces supportive and are encouraged to study.[1] But other workplaces offer no reward for further study. A high-school teacher says that, "there's no rewards… they'll give you a once-off payment and that's it - not even a natural promotion."[2]

The context of the academic department

All doctoral people are registered to study within a particular academic department. However, the role which the department plays in their lives differs depending on whether they are full-time or part-time students and whether they study at a distance or not. Those who are employed as academics also work within an academic department, which may not be the same one that they study in. Here we examine the context of the academic department, how the PhD is valued in this context and how it enables or constrains future plans.

For the academic department, having people enroll for and graduate from the PhD has several benefits. It helps to build a stimulating research environment, provides the opportunity for staff to supervise higher degrees, can increase the publication record of the department, results in financial benefits and in the longer term increases the prestige of the department and its staff. Because of this, academic departments can be expected to value the PhD highly and to encourage and support those embarking on it. Here someone who enrolled for a master's programme was persuaded by the director of the academic programme to do a PhD instead:

> *But then the director called me, he didn't understand why I wanted to do a second master's, because I had gotten a distinction in my other master's, and he was wondering why I didn't want to do a PhD instead. So he scheduled a meeting so that we could discuss it. … I told him that I felt like I didn't have enough time and I thought it was a long process and gave all those kind of excuses. Then he asked me, "But do you feel like you have the potential to do it?" I said, "Yes, in terms of potential, I know I can handle it, but in terms of time, I'm not sure I want to commit that amount of time to academics again." But then after talking to him and he told me to go and think about it, I really sat down with my husband and decided I was making a foolish decision. So that's how I ended up doing the PhD. (WPT15:9)*

[1] KEI12:16
[2] KET07:58-60

But the pressure that academic departments are under to teach, produce research and stay financially viable diverts attention from the PhD programme. A lecturer commented that "we should actually be paying attention to the PhD programme in a way that we do to the master's programme, but people are very hectic here, they have incredible loads."[1]

Well established academic departments are attractive places for full-time study, providing resources,[2] stimulating research environments,[3] colleagues with which to learn and share ideas[4] and opportunities to tutor or teach. The income earned from tutoring often enables people to study who would otherwise not be able to.[5] And for those who plan to pursue academic careers, the academic department is critical for learning the academic culture, learning about the functioning of the institution and gaining teaching experience which might be important for securing an academic position. [6]

For those who already work as academic staff, the department in which they work may be a more significant context than that in which they study, providing more frequent interaction with other PhD people[7] and mentoring.[8] But academic work often entails teaching and administrative workloads that make people delay their PhDs and interfere with their studies.[9] Academic staff who are employed on contracts are not entitled to sabbaticals or allocated time to do research.[10] Even those who are entitled to sabbaticals struggle to fit in the PhD work.

> *I had a sabbatical, but it was actually taken in two stretches, over two years, because my teaching then was all squeezed into the first semester for both years, and I got the second semester off to work on my research. But in fact what happened was some other massively exciting, sort of tangential projects popped up. So a bit of PhD got done, but essentially a whole lot of other stuff got done, that was very exciting. So it has been predominantly part-time. It's been a bit of a juggle. (WCI02:99–103)*

1 WPI04:259
2 CMI22:159; WCI02:227; WCI06:295,299
3 CMI05:27; CMI18:121
4 CMI05:35; CMI08:115
5 CMI02:106; CMI07:76; CMI16:156; CMI21:19; CMI23:113
6 CMI13:287; CMI23:31; WPI02:64-74
7 WCI02:187
8 CMI19:83
9 WCI01:27; WCI02:223; KEI06:39; CMI07:80; CMI11:31
10 KEI12:142

Academic staff who are working on PhDs have dual and often conflicting roles within the department as lecturer and student. These conflicts have also begun to be investigated with research that examines the challenges of supervising colleagues (Denicolo 2004; White 2004).

On the other hand, those who study part-time and those who study at an institution some distance from where they live and work might have very little interaction with the academic department. A part-time student says "I'm not that dependent on the university really, apart from having to go through their academic and administrative centres."[1]

The context of the discipline

That the discipline has an impact on when and how one does a PhD, is reflected in the correlations between the life paths of PhD people and the disciplines in which they are studying. The table below shows how the different career patterns were distributed over the four disciplines and highlights the differences between the pure and applied disciplines. Those in the applied disciplines are more likely to work outside of the university, be planning careers outside of the university or to be mid-career academic teachers. None of those interviewed in the two applied case studies were planning academic research careers. On the other hand, in the two case studies representing pure disciplines, people doing PhDs tend to be mid-career academic teachers or planning academic research careers.

	Work outside university	Plan non-university careers	Mid-career academic teachers	Plan academic research career	Career nomads	**Totals**
Civil engineering	3	1	2		1	**7**
English studies	1		2	2	1	**6**
Maths & applied maths		1	5	5	1	**12**
Public management	3	2	1		5	**11**
Total	**7**	**4**	**10**	**7**	**8**	**36**

Table 5.2: PhD people categorized in terms of career path by discipline

[1] WCI10:259

Of seven PhD people that I interviewed in civil and environmental engineering, three held academic positions and all three had worked outside of the academy. Another two worked primarily in the private sector and the remaining two in the public sector. Five of the seven were older with substantial work experience and three had held senior positions. In this case study no-one moved directly from their undergraduate studies through to the PhD, reflecting the value placed on work experience. The six PhD people based in English studies followed predominantly academic careers with only two working outside of the university, and both of those in education. Of those two, one would have preferred an academic job. While this discipline values the PhD, funds are scarce making it difficult to attract people to doctoral study or to facilitate full-time study. So most people were older and working while completing their studies part-time. Only one of them had been able to secure funding to study full-time.

In mathematics and applied mathematics I interviewed twelve PhD people of which half were younger and half were already established in academic careers. The younger PhD people in this department study full-time and are headed for academic careers, primarily as researchers. The number of young people in this department reflects the importance of the PhD for their careers. Older PhD people are established academics who had delayed their studies. Those studying public and development management included only one academic with five being in non-academic work and five nomads who moved between the university and other sectors. It appears that the cross disciplinary nature of public management attracts more career nomads who tend to have broader and less specialized interests. Most of these people were older with substantial work experience and their career plans included a mix of private, public and NGO work either in employment or as consultants.

Perhaps the biggest impact of the discipline on the PhD lies in the different cultural knowledge which is accumulated during the course of the PhD. Academic disciplines have distinct ways of understanding knowledge and practicing knowledge creation as well as distinct rules for social engagement in the discipline. Becoming part of an academic discipline involves developing "a sense of identity and personal commitment" (Becher & Trowler 2001:47) to the discipline and this has traditionally taken place during PhD studies. Becher notes that people who join the academy later in life bring with them sensibilities developed during their "past careers" (Becher & Trowler 2001:47). These case studies show that many people do PhDs in specialisms[1] or

[1] WCI01; WCI02; CMI07; CMI14

disciplines[1] different from those in which they completed their earlier degrees and many have ongoing careers which are grounded in different epistemologies, rules for engagement and identities. There are also an increasing number of academic units which identify themselves as multi-disciplinary, suggesting that PhDs in these units will not provide a strong socialization in the discipline.

The context of the supervisor

Because in South Africa, the model of doctoral education is typically based on the one-to-one relationship between a student and a supervisor (Dietz et al. 2006:10), this relationship is fundamental to the experience of doctoral study. All people who undertake the PhD in South Africa have a supervisor and some have two or three, making this relationship a key context for doctoral education. While the supervisor is employed in the academic department and works within the discipline, styles of supervision vary (Dietz et al. 2006:69) with different understandings of what the PhD is, different expectations of the PhD person and different kinds and levels of support. Here I explore how the PhD is valued in the context of the supervision relationship and how it enables or constrains future plans.[2]

Those who supervise generally value the PhD and put time and effort into the relationship, as one professor explains, "it's a privilege to have post-grad students and I think the assumption is we will do our best by our students."[3] Financial and career benefits accrue to the supervisor for successfully graduating PhDs,[4] so it is in their interests to recruit people into doctoral studies and to see that they graduate. However, increasing workloads and the lack of recognition of the work of supervision lead to some supervisors being disenchanted.[5]

The supervisor can be instrumental in the decision to study. One man studies because a chance meeting with his supervisor at a conference led to shared research[6] another got a call from his supervisor inviting him to work on a project.[7] The supervisor also directs people to funding sources including NRF bursaries, research posts and awards for doctoral students which they have secured as part of larger projects.[8] However, receiving funding through awards made to the

1 CMI21; WPI03; WPI07; WPI08
2 Supervision practice is examined in more depth in chapter six.
3 KEI05:80
4 CMI15:211
5 KEC01:2; CMI12:65-69; CMI18:165-177
6 WCT05:7
7 WCT10:11
8 WCI03:11; WCI05:27; WCI06:311; WCI07:163; KEI05:118; CMI01:7; CMI22:15

supervisor can leave the PhD person stranded when the supervisor moves to another institution.[1]

In the more competitive disciplines, one's choice of supervisor is important. A high profile supervisor can be useful in getting funding[2] or securing a postdoctoral position.[3] There were no direct reports of the supervision context constraining future plans although this was suggested indirectly. For example, students select supervisors who are active researchers in order to ensure that they can progress into research.[4]

The context of the family

The context of family[5] influences all PhD people to some extent and sixteen of the thirty-six interviews discussed family issues in some depth.[6] The families in which people grow up influence their perceptions of academic pursuits and further study. Whether, when and where they study depends on their responsibilities towards established families or their plans for establishing families. And future plans have to be negotiated around the expectations of parents and spouses and the needs of children.

Family can be instrumental in encouraging one to study. The schoolteacher who was inspired by his grandfather can recall being told "you must be a doctor"[7] and his wife pushes him saying, "You're wasting your talent - get into studies."[8] Another man says,

> *Well it's simple, we're not a well-educated family. And from my family, my father is the first one to produce graduates, and I'm the first teacher in that hierarchy, being one of the youngest. And that's what prompted me to say, "Look, let's set an example." (WPT10:32)*

A younger woman says "I'm the first female in my family to hold a university degree, so it was always like an ambition, 'I'll be a doctor one day.'"[9] And another young woman is pushed by her family into studying despite wanting to go into business. She later comes to appreciate having "a

1 WCT10:215
2 CMI05:95
3 CMI18:265
4 CMI07:7
5 Family is loosely interpreted to mean the people with whom one lives – including immediate or extended family groups or people who are unrelated.
6 CMI01; CMI02; CMI07; CMI08; KEI07; KEI12; WCI02; WCI03; WCI04; WCI06; WCI10; WPI07; WPI03; WPI06; WPI10; WPI12
7 KET07:24
8 KET07:20
9 WCI04:23

family that really cares."[1] Now part of her motivation for doing the PhD is "a family pride thing."[2]

Having a family and children to care for can discourage people from doctoral studies. Particularly for women, marriage and children are seen as being at odds with doctoral education. They say, "I don't have a husband and I don't have crying children or dinner or anything else to make, so I can have a PhD"[3] and "I don't have immediate family, in the sense of a husband and kids, and that was really the reason why I could decide to be a full-time student – I couldn't have been otherwise."[4] Another, who is married, sees this time before having children as a "luxury" – which is why she is studying now.[5] But for some women having children is too important to delay because "you want your life to run holistically"[6] and they fit their PhDs around their pregnancies and children.[7]

Those who have family responsibilities hesitate to embark on a PhD. Earlier we had the example of the woman who enrolled for a second master's because she had just had a son.[8] And when both parents in a family want to study further, one chooses to wait until the other has completed.[9] Those with established families who have to study away from home have to decide whether they and their families can endure the long separation,[10] and have to concern themselves with funding their families during their studies.[11]

One's choice of future plans may also depend on the family. For some, their choice of career has to be negotiated around family expectations.

> *I'd like to be self-employed – self-employed and be able to do projects like the ones I've been exposed to. Yeah. So to give me freedom. I would like to determine my own pension (laughs) yes ... Everybody else thinks it's a very unwise thing ... I think that people have been used to getting into a job and paying your taxes and working towards retirement and it has become a tradition. So now I am trying to do something different and, especially to be an African women*

1 WPT01:65-69
2 WPT01:41
3 WPI07:143
4 WPI08:139
5 WPI06:293
6 WPI10:153
7 KEI12:142; CMI21:71; WPI12:43. Incidentally one woman with two small children reported that a satisfying side-effect of having the title 'doctor' is that one gets very well treated by the medical profession (WPI12:369).
8 WPT15:09
9 WCT02:15
10 CMI01:233; CMI07:192; WCI06:253-255, 275
11 WCI06:323; CMI07:22

> *trying to do this. … So they are like, "Your husband won't approve" and "It won't be right" … Yes, I am told my head is in the clouds, be a realist. (WPI06:49-61)*

For a mother of two young children having a PhD promises more choices and flexible work which will allows her more time with her children.[1] And for others, getting the PhD will improve their prospects for future employment to the benefit of the family. This man says that the PhD is a "great opening opportunity for me, so it's really necessary to look at it and say, 'Ok, I just need to cross this bridge, things will be ok for me, for my family, for everyone.'"[2]

5.5 Conclusions

This chapter considered the questions: "Who undertakes PhD studies?" and "Why? I examined the life stories of doctoral people, considering what brought them to doctoral studies, why they enrolled for the PhD and what they hoped to gain from it. I found that typical PhD people in South Africa include those with established careers who work and plan to continue working outside of the university sector, younger people who are planning careers outside of the university sector, mid-career academic teachers, younger people who are planning academic research careers and nomadic people who choose to move in and out of academic work over the course of their careers.

There are many reasons why people undertake doctoral studies. They do so in the pursuit of knowledge, either because they want to find answers to problems or because they want to contribute to the knowledge base. For some the PhD is a fulfillment of early fantasies about learning and knowing. Others are driven by curiosity about their subject and find the process of doing research enjoyable. There are instrumentalist concerns with improving their employability and long-term career prospects, sometimes as a direct requirement and sometimes as a means of distinguishing themselves in a competitive environment. And some drift into the PhD for want of other options. However, the pursuit of a PhD is seldom based on a single reason, each person cites several motives for studying.

I proposed a model of doctoral education that positions the PhD person within a number of intersecting contexts with the configuration of contexts being unique to the individual. The contexts include academic contexts of supervisor, department and discipline, and non-academic contexts such as the workplace and the family. This model reflects other models of doctoral

[1] WPT09:401
[2] CMI06:247

education that are in use, but is more appropriate for the South African context. I illustrated the use of this model in understanding what attracts people to doctoral education and facilitates their participation.

In examining the experiences of adult, non-traditional, mature and re-entry students in higher education, Hewlett makes the point that locating these people "within the international access literature is limiting" because "these discourses of selectivity are associated with positioning such students as outsiders and as a minority in higher education" (Hewlett 2006:111). Analogously, the view of the PhD as preparation for an academic career and of PhD people who are older, working and not intent on academic careers as exceptions, is limiting. I argue for a more inclusive view of the full range of doctoral people and a broader understanding of what the PhD could be. In the next chapter I turn to the practice of the PhD and examine how the different views of the PhD which were explored in chapter four and the different kinds of PhD people encountered in this chapter affect how the practice of the PhD.

C h a p t e r 6

THE PRACTICE OF DOCTORAL EDUCATION

Supervision and beyond

6.1 Introduction

> *It's an apprenticeship. I would say that you're a carpenter, a bricklayer, or whatever it might be. It's practical, it's not completely abstract and theoretical. You have to ultimately make a table, but to do that you have to learn plenty of skills. You have to understand your tools, you perhaps have to go and buy a couple of tools and you work on each one of those. You start off by making a couple of legs and you help someone make a chair or a table. And then ultimately, once you've got a good understanding of it, you let your imagination run wild and create a beautiful lounger, or whatever.*
>
> *So I would say that that's probably my best understanding of it. I would say that you're really wasting your time if you try to do everything yourself. You should try and get as much into the space of your supervisor or the people you work with, because it's a practical endeavour, there are lots and lots of tricks. It's not always as clear as it is in the textbook, the exercise for the reader is not always as trivial as what you might think.*
>
> *I think the best model would be if your supervisor almost became your adopted father. You would work on a little desk, just next to them, the whole time. Every time they finish with a problem, they'd pass it on to you and you'd try and follow how they did it, or try and work on from there, or get another example and do it in the same way. And you would follow them home. And in the evening when you have an idea, around the dinner table, you speak to them about it. This is the ideal model. (CMI05:147)*

This description by someone mid-way through his doctoral studies in mathematics, of the way in which doctoral education ought to take place and the ideal supervision relationship, gives voice to the powerful archetype of the PhD as an apprentice to a master in an academic discipline. The PhD person is learning the tools and tricks of a craft and these are best learned by getting "into the space" of the craft master. There is, however, a suggestion that this is an ideal model, rather than his real experience.

In order to understand what happens in the process of doctoral education, this chapter focuses on the questions: "How is doctoral education organised?" and "What do supervisors

do and why?" I begin, in section 6.2, by describing the practice of doctoral education in the four case studies. These descriptions confirm that doctoral education in South Africa largely follows the "classic British model of supervision" (Dietz et al. 2006:9), in which a doctoral person works with a single supervisor on a research project over a long period of time. But the descriptions also highlight differences in the kind of work undertaken, the procedures followed, the degree to which people work alone or with others, and the activities in which they are engaged.

Although supervisors work within a framework for doctoral education set by the institution and the academic unit, the ways in which they approach supervision is "highly individualistic" which makes it difficult to examine doctoral education across academic units (Gilbert 2004). In section 6.3, I examine what individual supervisors do; the activities they engage in and how these relate to the practice of doctoral education in the academic unit. While supervision in all four of the case studies entails the traditional relationship between a supervisor and supervisee, I identify a number of patterns of doctoral research that surround the supervisory relationship and in section 6.4, I discuss these patterns and the circumstances under which they arise.

6.2 Societies of doctoral study

The notion of the PhD as an *apprenticeship* looms large in the minds of people involved in doctoral education in South Africa. Both supervisors[1] and PhD people[2] make frequent use of the terms "apprentice" and "apprenticeship." Supervisors say things like, "I'm still holding onto this kind of, the thesis as an apprenticeship you know, because I think I found that so valuable myself."[3] And it is widely acknowledged that the PhD usually involves independent work with a supervisor on a dissertation (Dietz et al. 2006:10; Mouton 2001:xi; Szanton & Manyika 2002:24). However, the reality is more complex.

As discussed in chapter two, a number of different models of doctoral education have been identified in South Africa, including individual supervision with mandatory seminar-based components; consortia which "bring together doctoral students for purposes of joint seminars and workshops"; the "split-side PhD" which includes formal courses at foreign universities; laboratory-based teams and graduate schools (Dietz et al. 2006:9-10; Jansen et al. 2004; Machel 2006; Sadlak 2004:51). But a discussion of doctoral education in terms of

1 WCI05:31,63; CMI15:199; WPI04:221; WPI05:45; KEI01:29; KEI09:203
2 CMI05:147; CMI08:171,187; CMI11:143,147; CMI21:111; KEI03:78,118,122,148
3 KEI09:203

overarching models "obscures important features and histories of the systems or programs in which they are situated" (Pearson 2005:123). Differences in the actual practice of doctoral education lie in the details of supervision arrangements and the amount and focus of structured course work (Huisman & Bartelse 2001:18; Pechar & Thomas 2004:23; Wits 2003); the use of cohorts (Page 2001:23; Jansen et al. 2004; Wits 2003) and the degree to which people have opportunities to collaborate and interact around their work (Chiang 2003:17-18; Eisenhart & De Haan 2005:10; Wits 2003); and differences in funding and the traditions of disciplines (Becher 1989:157; Wits 2003).

So what practices were observed in this study? The four academic units operate within a common higher education system and within institutions and faculties which set parameters for their operation. But each unit evolves its own practice within these constraints. This section focuses on the formal rules, implicit conventions and divisions of labour in the four case studies. The descriptions are intended to paint a rich picture of doctoral education in each context. They describe the physical infrastructure and atmosphere of the academic units as well as the procedures associated with doctoral study, and the less tangible rules imposed by the nature of knowledge and relationships in the discipline. In all four of the case studies, doctoral education is based on an individual relationship between the supervisor and PhD person, but the different contexts lead to differences in how this relationship is constructed.

Immersion in the world of working mathematicians

The Department of Mathematics and Applied Mathematics is large, comprising forty-eight permanent academic staff, thirteen support staff and an assortment of visiting scholars.[1] At the time of the study there were twenty-three people registered for PhDs. The department is housed in an elegant old ivy-clad building. The somewhat cold corridors are countered by high windows and warm wooden furniture in most of the offices. Apart from office space, the building houses lecture rooms, a computer laboratory, a small departmental library and a

[1] According to the departmental web site http://www.mth.uct.ac.za/ accessed 22 July 2008.

large staff room. There is an air of organised activity with well-maintained notice-boards advertising research activities and career opportunities for students. The building has been modified to make more office space and full-time PhD people occupy shared offices on the top floor and in the basement. Their offices are generally not near those of their supervisors, but are grouped together with those of other postgraduates.

This department does not actively recruit people for doctoral study because, as one of the largest and most active mathematics departments in the country, "they come to us."[1] Supervisors are either approached directly or more general enquiries about supervision are received.[2] Two members of the academic staff act as coordinators for postgraduate studies. They consider applications, communicate with applicants, pass on applications to potential supervisors[3] and make recommendations for bursary applications.[4] While it would be the role of the coordinators to mediate in cases where difficulties arise between supervisor and supervisee, this has not really been necessary.[5] One of the administrative assistants in the department is responsible for postgraduate administration and she plays an important supportive role for PhD people, particularly foreigners.[6]

Supervisors decide for themselves whether or not to supervise and, although there is no formal training for supervision,[7] "the ones that want to supervise are normally well qualified to do so."[8] How many people are supervised at once depends on the supervision and co-supervision arrangements,[9] on the nature of the research[10] and on funding. This department is fortunate in that there are funds available for postgraduate study. A supervisor says that "the NRF and the government and the DST[11] are already pumping money into South African science … for now it's a good time to be here, especially in mathematics and physics."[12] But researchers are unevenly funded and those with access to funds are better able to attract doctoral people.[13] Funds are often earmarked for South African citizens so that

1 CMI19:47
2 CMI17:8; CMI20:07; CMI23:45,49
3 CMT10:18, 124; CMT03:7,51
4 CMT10:32
5 CMT03:67
6 CMC05:2; CMD03
7 CMI17:144; CMI20:95; CMI23:45. The university does run programmes for 'new academic practitioners' and 'emerging researchers' which include support in setting up research projects and sourcing funding for postgraduates (CMI23:75,83).
8 CMI20:79 also CMI17:128,140
9 CMI20:103
10 CMI17:200-206
11 Department of Science and Technology
12 CMI03: 24
13 CMI20:59

foreign students find it more difficult to access them.[1] Most of the PhD people in this department study full-time, some tutor or lecture in order to supplement fellowships and bursaries and some are employed as researchers.

The faculty in which this department is situated has instituted a "memorandum of understanding" between supervisors and supervisees which is negotiated and signed "at the time of initial registration."[2] It sets out "how much work is required … the frequency of reporting, where the money's coming from, … what will be provided for the student, what won't."[3] The format is not prescriptive; rather it has headings and blank spaces to be filled in. Although "it's got to prove itself yet"[4] most supervisors are cautiously optimistic about this document[5] and PhD people appreciate having clear expectations.[6]

A proposal is produced for registration which is often fairly short.[7] For mathematicians, it is often not possible to say in advance what problems will be solved[8] and the difficulty of evaluating proposals which are incomprehensible to all but a small group of experts[9] makes the proposal a less significant part of doctoral studies. According to both supervisors and PhD people, supervision meetings normally take place once a week for about an hour,[10] but some meet more frequently[11] and those further along in their studies or being co-supervised may meet less often.[12] Supervisors submit an annual report on progress, which is required for re-registration.[13]

A dominant feature of the department is the existence of numerous research groups consisting of one or more staff members and their postgraduates.[14] Research groups have different levels of funding, different social practices[15] and different approaches to pedagogy which means that the experience people have of the PhD depends to a large extent on the group into which they fall. Depending on the research group and individual needs, they may

1 CMI01:7; CMI02:100-106; CMI07:68; CMI20:51
2 CMD02:1
3 CMI20:71
4 CMI20:71
5 CMI03:64; CMI09:216; CMI12:163; CMI15:331; CMI17:184; CMI18:285; CMI20:71; CMI22:203; CMI23:27
6 CMI05:143; CMI08:143; CMI11:167; CMI13:179
7 CMI16:116; CMI04:83; CMI22:231; CMI01:71; CMI19:71; CMI22:235
8 CMI02:40; CMI13:107; CMI14:159-163; CMI17:164
9 CMI03:72; CMI15:187; CMI22:231
10 CMI01:129; CMI02:52; CMI09:204-208; CMI10:147; CMI12:131; CMI16:136
11 CMI03:92; CMI10:147; CMI18:197
12 CMI12:131; CMI19:95
13 CMI17:192; CMI20:63
14 These may include master's, doctoral and post-doctoral people.
15 CMI22:195; CMI18:249

be expected to attend doctoral seminars,[1] honours- or master's-level courses,[2] research seminars,[3] and workshops or conferences.[4] In some specialties PhD people publish papers during their candidature,[5] but in others the thesis "is in some senses a big paper" and gets published on completion.[6] The environment appears immersive in that doctoral people participate in a wide range of the activities of working mathematicians and get exposed to many aspects of the academic world. They confirm this impression, complaining that at the PhD level, they also become exposed to the complexities of departmental politics.[7]

The end product and only form of evaluation of the PhD is a written thesis, the style and structure of which differs by the area of specialization.[8] The thesis is examined by two or three external examiners and one internal examiner who cannot be the supervisor.[9] Supervisors suggest possible examiners who are vetted by the postgraduate coordinators[10] and appointed by a committee of assessors.[11] The coordinators manage the submissions procedure; they notify the faculty office and ensure the necessary forms are completed.[12] The consideration of the examiner reports and the final decision on the thesis is made by a university doctoral degrees board.[13]

Engaging alone with the (English) text

The Department of English Studies falls within the School of Literary Studies, Media and Creative Arts. It comprises twenty-three academic staff and two administrators.[14] I was given

1 CMI03:56; CMI10:147; CMI13:111
2 CMI01:85; CMI09:164; CMI20:163
3 CMI02:52; CMI07:120; CMI08:75; CMI11:87,139; CMI13:123; CMI14:187; CMI16:74; CMI19:203
4 CMI04:103; CMI12:65; CMI19:179
5 CMI03:64; CMI05:67; CMI07:112; CMI12:207; CMI22:123
6 CMI23:87 also CMI03:60; CMI17:252
7 CMI05:87; CMI06:191; CMI08:167; CMI13:251; CMI14:119
8 CMD10; CMI23:17
9 CMT10:64
10 CMT10:48,96; CMT03:7
11 CMT03:19
12 CMT03:7
13 CMT10:36, CMT03:31
14 KED16

the names of fourteen people registered for doctoral study, of whom three were members of staff. The department occupies half of the first floor of an imposing grey building with a curved façade. A palm-lined path sweeps along the front of the building. The rather bleak foyer at the entrance to the department leads to a corridor decorated with neatly-hung pictures. The space consists mostly of offices and a few seminar rooms. Administrative staff share a large office at the beginning of the corridor with the shared printers and copiers spilling over into the office of the head of department. Decoration is a feature of this department. Several of the supervisors have colourfully painted offices filled with pictures and craftwork. Most PhD people work elsewhere and do not have offices. Those that do are junior staff who are housed along a second corridor at the back of the building.

One of the academic staff acts as coordinator for postgraduate studies.[1] Potential candidates approach her and she considers their area of interest and puts them in touch with possible supervisors.[2] They should have published or "at least given a conference paper"[3] or they may be asked to analyse a text[4] as part of a screening process before acceptance. Those doing PhDs in English tend to be either "on the staff as junior lecturers or tutors, or contracts and they're trying to get into the field"[5] or they are employed in schools or other educational institutions.[6] Some study from a distance.[7] Some have access to NRF funds[8] which "are for full-time study but they're not enough."[9] The postgraduate coordinator keeps a list of potential bursaries and scholarships and alerts doctoral people to their deadlines.[10] Almost all PhD people are in some kind of employment.

Candidates have to submit a proposal in order to register and are given detailed guidelines as to the structure of the proposal. It should include a literature study, the research problems, theories "upon which the research project will be constructed"; methodology and methods; the structure of the dissertation; references categorised into primary sources, unpublished research and published research; as well as a research schedule.[11] A proposal which I

1 KET05:16
2 KET05:56
3 KEI01:23 also KEI10:11
4 KEI05:56
5 KEI08:21
6 KEI01:21; KEI05:22; KEI10:36
7 KEI13:169
8 KEI02:87,141; KEI03:22; KEI06:71; KEI11:135
9 KEI09:267
10 KET05:118
11 KED01

examined was eleven pages long.[1] An ethics clearance application and a supervision contract are also required. Preparing the proposal is expected to take about six months[2] but may take up to a year.[3] Proposals are circulated around the department for review.[4]

The supervision contract is a two page document which describes the relationship as "one of mentorship."[5] It points out that thesis editing is not the supervisor's responsibility, advises against plagiarism, specifies the maximum time for completion and allows space in which to set expectations like the frequency of supervision meetings. The contract is "comparatively new"[6] and those who had been enrolled for some time were not aware of it.[7] There are mixed views about its value. On the one hand it is helpful to make expectations explicit,[8] "it gives you a sense of process"[9] and provides some protection to both parties.[10] But it is not an ideal solution because "obviously, if you start waving a piece of paper and becoming legalistic, that's going to damage your relationship."[11] Few felt that the contract would be of much benefit if things went seriously wrong.[12]

Anyone with a PhD can supervise.[13] Usually they take on one or two PhDs at a time, but if there is interest in a particular area, "some people do get a little overloaded."[14] There is no formal training for supervision[15] apart from "the odd workshop where we talk about these things"[16] but more systematic training is planned.[17] Supervisors feel that regular supervision meetings are important[18] but the frequency of meetings varies from every one or two months[19] to "at least every six months."[20] It may be "every other week" during the final stages of writing[21] or very infrequent for those who are supervised at a distance.[22] Supervision

1 KED14
2 KEI06:41
3 KEI12:88
4 KEI05:84
5 KED04
6 KEI02:247
7 KEI07:116
8 KEI04:58; KEI09:111; KEI13:121,137,289
9 KEI04:55
10 KEI02:247,249
11 KEI09:115
12 KEI03:164; KEI08:135; KEI09:115; KEI10:79,84
13 KEI05:72
14 KEI05:74
15 KEI01:87,93; KEI05:76; KEI08:47; KEI09:127
16 KEI05:78; also KEI10:29
17 KEI01:87; KEI08:49
18 KEI02:129; KEI05:70; KEI08:55
19 KEI05:64; KEI11:86; KEI13:117,168
20 KEI05:68
21 KEI05:68
22 KEI13:169

meetings sometimes take place at the supervisor's home or over the weekend.[1] Supervisors submit an annual progress report.[2]

PhD people may be part of a reading group[3] or attend project meetings "if they're on a grant from a project"[4] and the faculty research office runs an annual two-day postgraduate conference.[5] The department had "until the recent past, a seminar in which postgrads gave papers"[6] but "that just fell away"[7] and other interdisciplinary initiatives also "ran out of steam."[8] These arrangements are not sustainable because staff are overwhelmed with administrative work[9] and students lack the drive to run them.[10] Doctoral people are invited to attend weekly department research seminars, but few do.[11]

Generally doctoral work takes place alone and getting a PhD in English is "a lonely process."[12] One PhD person says she has "absolutely no idea" who the other doctoral people in the department are, "they come and go, they're like ghosts."[13] A supervisor who recently completed her PhD says that because "I was going to conferences and publishing articles and involved in an academic community, it wasn't as lonely as it could have been"[14] and another PhD person says that he deliberately attends conferences and does a lot of "networking"[15] but such participation appears to depend on individual initiative. Others do not attend conferences, sometimes citing a lack of funds.[16]

People in this discipline get excited by texts. They enthuse about documents "sitting at archives in Pretoria" that are "old, ninety-years old … and they allowed me to scan the thing in full colour!"[17] Librarians and archivists play an important role in their lives.[18] Technology

1 KEI05:98; KEI13:169
2 KEI03:164; KEI05:54
3 KEI09:211
4 KEI05:64
5 KEI02:149; KEI05:64; KEI13:105
6 KEI01:65
7 KEI02:145 also KEI05:114, KEI10:61
8 KEI02:149
9 KEI02:149
10 KEI08:117
11 KEI04:83; KEI05:114; KEI06:63; KEI08:83; KEI10:69; KEI11:96; KEI12:48
12 KEI06:32 also KEI01:127,141; KEI05:88,112-114; KEI08:115; KEI09:211,215; KEI10:58; KEI11:68,151; KEI13:259
13 KEI06:61
14 KET03:215
15 KET12:86
16 KEI11:131
17 KET12:30
18 KEI02:177; KEI03:30,136; KEI05:66,118,120; KEI09:279

has made access easier,[1] but sometimes they must travel to access specific texts or better stocked libraries.[2]

The PhD is examined on the basis of a thesis which should be a "major work, and it should take years."[3] The nature of the thesis in English has changed over the years, "Traditionally it would be on either a stand-alone writer, someone established, or a period with a number of writers perhaps attached to that period."[4] But there is increasing scope to examine more popular writing and do interdisciplinary work[5] and there is room for innovation in the style and structure of the thesis.[6] This case study reflects views expressed in the literature that the English doctorate has moved towards being "a do-it-yourself kit that depends for its shape on each student's particular interests and creative initiative" (Graff 2006:372). The thesis is examined by one internal examiner and two external examiners.[7] Examiners are given guidelines which suggest that the "thesis must constitute *original research* and is expected to make *an original contribution to the field*."[8] They are given a list of fourteen points to consider in their report.[9]

Small group collaboration to solve problems in the physical world

The School of Civil and Environmental Engineering was the smallest of the case studies with fifteen full-time academic staff and "eight full-time PhD students … and probably another eight part-timers."[10] I met one administrator and there are a number of technical staff who support the laboratories. It is home to five research groups: construction materials, geotechnical and geoenvironmental engineering, water research, structural engineering and

1 KEI03:30; KEI05:120
2 KEI03:24; KEI05:120-122; KEI06:93; KEI11:135
3 KEI05:40
4 KEI05:102-104
5 KEI05:100-101
6 KEI08:195
7 KET05:54
8 KED03:1, emphasis in original
9 KED03:2-3
10 WCI08:23

environmental engineering.[1] The school is housed in a solid block of a building. To one side of the entrance are three floors of corridors housing office and teaching spaces. To the other is a large-volume space housing laboratories and around the edge of this runs a mezzanine floor with more offices. There is a staff room leading off the first-floor landing of the main staircase. Offices are allocated in no discernable pattern with postgraduates interspersed between staff members. Some share offices. One supervisor in the mezzanine section says that he has been encouraged to move to the main corridor, but insists on being near his supervisees.[2]

Supervisors advertise on the school web site for PhD applications[3] or approach people whose master's they supervised.[4] PhD people ask those in the field to recommend potential supervisors[5] or they take a more direct approach, "I sent a general e-mail out to the planning department and engineering section and a couple of people responded."[6] They get to know their supervisors through interactions at work[7] or they meet at conferences.[8] There is a postgraduate coordinator, but he only gets involved with applications when people have "extraordinary qualifications" from unknown universities.[9]

PhD people who are not in full-time employment tend to study with whoever can provide funding.[10] Funds come from the NRF,[11] bursaries and scholarships[12] or research contracts.[13] In return postgraduates assist in "tutorials and laboratory demonstrations and one thing or another."[14] A supervisor says that "most PhD's in engineering, are funded through contracts that supervisors bring in"[15] and the school web site suggests that NRF funding can be topped up by "approximately 70% from industry funding."[16] While this seems to imply that PhD people are well-funded, the promised funding does not always materialize. One person found

1 Civil and Environmental Engineering web site, http://web.wits.ac.za/Academic/EBE/CEE/CEE.htm accessed 24 June 2008.
2 WCT03:111
3 WCD02
4 WCI07:11
5 WCI04:135; WCI10:47
6 WCT09:135
7 WCI01:17-27; WCI02:27
8 WCT05:7
9 WCT07:37
10 WCI01:161; WCI05:95; WCI09:183
11 WCI05:27; WCI08:217
12 WCI05:31; WCI06:315; WCI07:447; WCI09:75; WCI10:35
13 WCI05:27; WCI06:311; WCI07:195; WCI08:221
14 WCI08:105
15 WCI05:27
16 Construction materials web site http://web.wits.ac.za/Academic/EBE/CEE/ResearchGroups/Civil/ConstructionMaterials.htm, accessed 24 June 2008.

this out after he had "already resigned from my work; I couldn't go back."[1] He alternates consulting work with his studies to cover his expenses.[2] The relationship with outside clients is financially beneficial but it has drawbacks because doctoral people don't get to craft their own research questions[3] and they get pulled into consulting work.[4]

Most of the staff in civil and environmental engineering supervise research degrees with between one and eight master's and doctoral people per supervisor at one time. In the past there had been a staff member who supervised twelve or fifteen at a time.[5] While this meant that he "spread his time pretty thinly,"[6] these "heavily-loaded supervisors were very successful with their students … they were just top-notch fellows."[7] The university provides some training in supervision and one supervisor had attended a two hour workshop,[8] but another preferred to rely on his own "common sense."[9]

The department provides a one-page description of the "format for PhD proposals."[10] It specifies that the proposal should not exceed eight pages although supervisors were vague about the length required[11] and sample proposals I collected ranged from ten to sixteen pages.[12] Writing the proposal is "quite quick"[13] and "it was very easy from literature review just to put what was actually a gap and … what to put there."[14] Difficulties encountered were technical, "I didn't understand [what] the Green element was," and relatively easy to deal with.[15] Writing the proposal takes "less than a month" or about six weeks.[16] The postgraduate coordinator convenes seminars to evaluate proposals.[17]

According to the engineering faculty, the supervisor's duties include "to assist the candidate's research in all possible ways," regular supervision meetings, and giving oral and written

1 WCT10:347
2 WCT10:331 also WCI09:87
3 WCI05:31; WCI07:127; WCI09:259,263
4 WCT01:195
5 WCI08:65
6 WCI08:73
7 WCI08:73
8 WCI09:187
9 WCI08:85
10 WCD07 also WCI06:91
11 WCI05:35; WCI09:131
12 WCD05; WCD11; WCD12; WCD13
13 WCI02:151
14 WCI03:93
15 WCT05:87
16 WCI01:105; WCI02:151
17 WCT07:11 also WCD06:1

advice. The faculty also specifies administrative tasks and procedures.[1] The university has produced a "statement of principles for postgraduate supervision" which takes the form of a signed supervision agreement, but this had only recently been circulated and was not in use. Supervision meetings are infrequent, every "few weeks."[2] One person who works in another city, sees her supervisor "once or twice a year" but keeps in touch by e-mail and has more regular contact with the "co-supervisor that works here."[3] Supervisors report annually to the faculty office on progress.[4]

The work done in this department is focused on solving real-world problems and improving engineering practice. PhD people employed in government departments seek knowledge that contributes to the work of these departments; managing urban rivers[5] or understanding what water quality means.[6] Theses results in construction guidelines and methods, protocols on dust control and waste management, decision support systems, models, and methods for evaluating the cost of environmental impact.[7]

PhD people interact with the academic community. They give advice to master's students[8] and present their proposals to a departmental committee.[9] Those working on research contracts present their work to external clients[10] or at seminars convened with the private sector.[11] Doctoral seminars and research seminars are held,[12] but not very frequently[13] and those in full-time employment often don't attend because seminars "clash with either field work or meetings."[14] PhD people attend conferences[15] and publish papers,[16] but their involvement is often only within the research group and it is possible to spend two years in the department without knowing who the PhD people in other research groups are.[17] The thesis is examined by two internal and one external examiner and is expected to show

1 WCD04; WCD08
2 WCI06:119; WCI09:231
3 WCT04:151
4 WCI05:143; WCI08:141
5 WCI04:67
6 WCI10:19
7 WCD18
8 WCI02:159; WCI04:119
9 WCI03:143,147; WCI06:95; WCI08:49; WCI09:131; WCI10:167
10 WCI07:195,311
11 WCI03:135
12 WCI02:67; WCI03:135,139; WCI04:131; WCI06:95; WCI08:109
13 WCI08:109; WCI09:211
14 WCI04:131 also WCI10:191
15 WCI01:221; WCI02:195; WCI03:57,61; WCI06:7; WCI09:163,183,249; WCI10:151,187
16 WCI02:235; WCI03:57; WCI05:59; WCI06:223; WCI09:163
17 WCI07:419

"knowledge and proficiency in the methods of research," that the candidate has undertaken original research and "a substantial contribution to the advancement of knowledge."[1]

Academic engagement in social research for public benefit

The Graduate School of Public and Development Management (P&DM), employs twenty permanent academic staff and about another twenty visiting, honorary or associate academics. They are supported by twenty administrative staff. The school hosts the Southern African Defence & Security Management Network and the LINK Centre which researches in the area of ICT policy, regulation and management.[2] As a graduate school, P&DM offers a range of short courses and master's programmes. The doctoral programme is relatively new, producing its first graduates in 2001.[3] I was given a list of thirty-four PhD people and seven recent graduates.

The school is housed in a modern building with an impressive entrance. Academic staff have offices on the top floor behind two sets of doors, the second of which are kept locked. There is a seminar room to the left of these doors. On either side of the L-shaped corridor, notice-boards display pictures of staff and past graduates. I wait for my first interview in a room with yellow painted walls, plants, comfortable sofas, cheerful pictures and a list of staff birthdays on the wall.[4] Most of the doctoral people in this school are employed in the public and non-profit sectors and do not have offices on campus.[5] Those that study full-time are mostly foreigners. They tend to be self-funded, often through consulting work,[6] and one through a larger funded project at the university where he was employed.[7] They share a large,

1 WCD03
2 School web site http://web.wits.ac.za/Academic/CLM/PDM/PDMHome.htm accessed 24 June 2008.
3 WPI14:09
4 WPC02:2
5 WPI02:34; WPI07:11,15; WPI11:34
6 WPI03:27; WPI10:33; WPI06:33
7 WPI01:132

somewhat bleak office in a building some distance away from the staff offices and generally do not participate in the teaching work of the school.[1]

The school provides a comprehensive "Handbook for P&DM Research Degrees"[2] which describes the administrative processes and the roles of the supervisor and supervisee, discusses ethical considerations, and sets out styles for proposals, theses and referencing. It also includes copies of the school's standing orders for the PhD degree. The handbook describes the doctoral study process in terms of six stages: application, preparation, candidature, submission, examination and graduation.

During the preparation stage, doctoral people complete a social theory course in which they are exposed to a range of theoretical positions and research approaches and they draft a short proposal. This course was developed "because our students are not traditional students" and they needed to develop scholarship.[3] A supervisor says, "it isn't really a social theory course, and it isn't really a methodology course … it's a PhD preparation course."[4] Because it has not been possible to register the course at the PhD level,[5] it is completed before registering for the PhD.[6] According to some sources, attendance is compulsory,[7] but the departmental web site is a little more vague, saying that there is an "attendance requirement that may include prerequisite courses (depending upon your background)"[8] and one supervisor tries to ensure that his supervisees do not attend.[9] He is critical of the content and the way the process distances the supervisor from the proposal.[10] But most people who completed the course valued it[11] and it is now being offered to doctoral people across the faculty.

PhD people "are responsible for identifying, approaching and securing a supervisor."[12] Some make contact via the web site before they commence,[13] but others identify their supervisors after completing the social theory course.[14] They rely on personal recommendations[15] or

1 WPI02:66,78
2 WPD03
3 WPI04:93-95 also WPI15:131
4 WPI14:35 also WPI15:141
5 It is not clear whether this restriction is being imposed by the university or by the national department of education.
6 WPI04:185; WPI05:19
7 WPD03:16; WPI05:37
8 School web site http://web.wits.ac.za/Academic/CLM/PDM/CourseOutlines/DegreePHD.htm accessed 24 June 2008.
9 WPT08:37
10 WPT08:19-21,39; WPD07
11 WPI03:111; WPI06:333; WPI07:111; WPI08:51; WPI10:117; WPI11:56; WPI12:471
12 WPD03:7
13 WPI10:85
14 WPI05:21; WPI11:66
15 WPI11:66

suggestions from the department as to people working in related fields[1] and sometimes the department assigns a supervisor.[2] Academic staff supervise around ten master's students each year as well as between one and five PhDs.[3] Because of the high number of research students, all staff with PhDs are expected to supervise, "but we don't force people to supervise at PhD level."[4] The institution offers training in supervision[5] and workshops on supervision and conceptualizing research are run by a member of staff in the school,[6] but they only attract "those people who are interested."[7] Others feel that "new supervisors can learn from old supervisors."[8]

According to the handbook, there should be a minimum of six supervision meetings or thirty contact hours a year.[9] Because each supervisor supervises many postgraduates, most of whom are in full-time employment, they make use of e-mail and telephone calls to stay in touch[10] and meet when requested.[11] When pressed they say that they meet "thrice a month"[12] or "once a month."[13] The departmental handbook makes it clear that supervisors can't be expected to "be available 24 hours a day."[14]

After completing the social theory course, work begins on a long proposal. Both the short and long proposal are evaluated by a committee within the school[15] and the long proposal is submitted to the faculty higher degrees committee for formal acceptance and admission to candidature.[16] When the thesis is ready for submission, it is defended to and approved by a submissions committee within the school before submission to the faculty office for examination.[17] These committees appear to have been useful in reducing the number of proposals rejected by the higher degrees committee and improving the quality of theses

1 WPI06:139
2 WPI08:97
3 WPI14:21 also WPI04:157; WPC02:3
4 WPI14:43
5 WPI09:111
6 WPI04:121; WPI14:43
7 WPI04:121
8 WPI05:59
9 WPD03:8 also WPI09:99
10 WPI05:47; WPI06:155; WPI09:99
11 WPI05:47; WPI06:159; WPI08:93; WPI11:60; WPI14:55
12 WPI09:99
13 WPI05:47
14 WPD03:9
15 WPD03:16; WPI04:171
16 WPD03:15
17 WPD03:19; WPI04:177

submitted.[1] Three members of staff have backgrounds in education[2] which may explain why there is a greater focus on pedagogy in this department.

Doctoral research in public administration in South Africa tends to focus on public organisational development and management, human resources management, policy analysis and service delivery (Wessels 2007:374). PhD people in this department seek knowledge which can be applied to social problems.[3] They want their research to "have practical application,"[4] but they find that the PhD is "an academic qualification."[5] People doing PhDs in this school come from a range of knowledge areas[6] and supervisors also represent a range of disciplinary backgrounds. It is possible that conflicting disciplinary cultures contribute to conflicts over doctoral education in this school.

Comparing the four academic units

From these descriptions it is clear that doctoral education is more varied than the single model of one-on-one supervision in use at South African universities, would seem to suggest. The table below compares some of the features of the four case study sites.

	Mathematics and Applied Mathematics	**English Studies**	**Civil and Environmental Engineering**	**Public and Development Management**
Academic staff	48 + visiting scholars	23	15	20 + 20 associates
Other staff	13	2	1 + technicians	20
PhD people	23	14	± 16	> 34
Mode of study	Predominantly full-time	Predominantly part-time	About half full-time and half part-time	Predominantly part-time
How people locate a supervisor	Identified during undergraduate studies; department web site; approach postgraduate coordinators	Approach postgraduate coordinator	Department web site; recommended by colleagues; conferences	School web site; assigned by school

1 WPI04:93, WPI14:45-47
2 WPI04:119
3 WPI04:69; WPI07:195; WPI10:197; WPI15:95
4 WPI12:417
5 WPI04:45
6 WPI04:41,95

	Mathematics and Applied Mathematics	**English Studies**	**Civil and Environmental Engineering**	**Public and Development Management**
Learning to supervise	Institution provides 'New academic practitioner' and 'emerging researchers' programmes	No formal training, occasional workshops	Institution provides supervision workshops	School and institution provide supervision workshops
How people fund their PhD studies	NRF, DST, bursaries and scholarships, part-time employment	NRF, bursaries and scholarships and full-time employment	NRF, bursaries and scholarships, contract research, full-time employment, short-term contract employment	Full-time employment, short-term contract employment
Research proposal	One or two paragraphs, indicating area. Often written by the supervisor. More substantial in some research groups.	About 10 pages. Comprehensive guidelines give structure. Circulated to department.	Short proposal, an administrative requirement. Often developed by supervisor for funding. Presented to committee.	Short proposal developed during the social theory course. Long proposal developed with supervisor. Both presented to a committee.
Supervision contract	Non-prescriptive "memorandum of understanding" widely used.	Supervision contract widely used.	"Principles for postgraduate supervision" not yet in use.	Supervision contract recently introduced.
Supervision meetings	About once a week.	Every one or two months.	Every few weeks.	Six meetings a year, or more. Regular contact by telephone and e-mail
Engagement with the department	Depending on research group and individual need. Tutoring, doctoral and research seminars, courses, workshops, publications.	Little contact beyond supervisor. Occasional seminars.	Regular contact with research group. Tutoring and other duties (if full-time). Seminars, conferences and publications.	Social theory and research course. Individuals may be asked to attend specific courses.

Table 6.1: The practice of doctoral education in the four academic units

Comparing doctoral education across the academic units highlights differences in the size of the units, the modes of study, the type and frequency of interaction between doctoral people and the unit and the procedures in use. All of these factors play a part in constructing the overall nature of the doctoral programme. I have described how four different academic units organise doctoral education, now I want to turn to examining in more detail what individual supervisors do.

6.3 How supervisors construct their practice

> *But you probably will find significant variation even within a school and, I suspect that there's going to be a lot of noise in what you're doing, because the difference between supervisors is possibly almost as great sometimes as the difference between disciplines. (WCI05:11)*

This observation by a supervisor in the study, reflects one of the core difficulties in researching the practice of doctoral education. The practice differs, not only across departments and disciplines, but also by the individual supervisor. Each constructs their own practice so that it is questionable whether the academic unit (or discipline) can be the unit of study (Gilbert 2004:302). In addition, the practices adopted by any one supervisor differ depending on the person who they are supervising. They say that, "the student will also provide one with a kind of framework that you respond to"[1] and "I rely very often on doctoral people to guide me."[2]

The problem is compounded by the secrecy which surrounds doctoral supervision. Even within the same department, supervisors don't know what their colleagues do in the process of supervision:

> *I don't know how other people supervise. It's... it's something... people are... we're not secretive about it; it's just... you have your student and you get on with them. Maybe it's quite an English department thing, I don't know. (KEI05:80)*

Despite the proliferation of activities in doctoral education such as seminars, (Metz 2001; Sadlak 2004:18,41), "small and large group discussions, lectures, presentations, and … in-class projects" (Lesko et al. 2006:8), "roundtables" (Page 2001:23), lectures (Huisman & Bartelse 2001:11) and team teaching arrangements (Page 2001:22), and increasing explorations of collaborative and team-based research arrangements (Chiang 2003:17-18;

1 KEI13:173
2 KEI10:11

Lunsford 2006:366; Runquist et al. 2006:32-34), supervision "remains an intensely private affair" (Kamler & Thompson 2006:10; also Johnson et al. 2000:136).

So what is it that supervisors do? And what informs their practice? In this section I examine how people learn to supervise; how they create new practices; and how they draw on the procedures set down by the academic unit or institution in constructing their own practice.

Learning to supervise

Across the case studies, the only requirement for becoming a supervisor is having a PhD.[1] This underscores the belief that one learns to supervise in the course of being supervised. Because the PhD is a "self-directed thing … you have to decide for yourself how much or how little of that particular thing you need to engage with" and this experience develops the "capacity to be able to provide that for the next generation."[2] This study confirms that much of the practice of supervision is based on the experience of having been supervised (Dietz et al. 2006:11). Supervisors say, "I've always supervised in the way that my supervisor supervised me and I thought that that was the most effective way to do it."[3]

This is a successful strategy if their own supervision was effective, but "a lot of people were supervised horribly, so to then perpetuate that is criminal."[4] Some seek to avoid practices which they found unhelpful or to provide what was missing from their own experience. One man says, "I don't want to replicate my supervision experience which was rather bad." He was largely left alone with little input from his supervisor, so he takes a more active role with his PhD people, e-mailing them weekly and meeting them once a month.[5] A woman who "considered bailing out" of her PhD when she had children says "I know when I was going through a lot of that, I didn't really have a role model, and it was quite hard thinking, 'Has anybody actually done this?' and 'Can you actually do this?'" As a result she is more supportive towards the women she supervises, sharing "some of my own experiences … because I feel it's something I can do."[6]

1 CMI17:128,140; CMI20:79; KEI05:72; WPI14:43
2 WCI02:139,143
3 KEI13:137 also CMI18:269; CMI20:95; KEI10:86; WPI04:301
4 WPI04:171
5 WPI05:45 also KEI02:95; WCI05:171; WPI14:80
6 CMT07:47

Supervision is "something you have to learn on the job"[1] because as a new supervisor "you're left to find out on your own … what is expected of you."[2] People rely on "common sense"[3] or their own intelligence, as this experienced supervisor says:

> *When I look at my own career, all of these things, I was just expected to be able to do. Nobody had ever shown me how and, you know, if you've got an average to good intelligence, you can look at what other people have done and then work out for yourself how to do it. (KEI10:53)*

Perhaps the most important source of information about supervision is other supervisors: "We learn so much from each other on the corridors when we discuss: 'How did you handle this particular problem student? … What did you do?'"[4] This works well within research groups where there are opportunities for co-supervision and the group can "contribute to moving a project along."[5] Supervising master's students prepares one for supervising at the PhD level, as does co-supervising with someone more experienced.[6] And more experienced supervisors go out of their way to pass on their knowledge, as this woman says of a colleague:

> *… she's just got her PhD, so she's just starting supervising. So what I thought would be helpful – because no-one ever did this to me – I've shown her higher degrees proposal forms that were successful. And I said, "Have a look at this. It may or may not help, but this is the kind of thing that went through first time." … And she was really grateful for that. (KEI05:82-84)*

In developing their supervision practice, supervisors draw on their experience in other aspects of academic work. For example, one says of helping to craft a thesis, "I suppose what helps me is my own experience of writing book-length stuff and then having to edit my own work, and become conscious of, you know, what academic register is, and chop out things and so on."[7] Another who has a background in developing educational materials, says that

1 KEI10:30
2 KEI02:239
3 WCI08:85
4 KEI06:26 also CMI15:251; CMI17:148; CMI20:95; CMI23:71; KEI05:78; WPI05:59
5 CMI20:95 also CMI10:171
6 CMI18:19; CMI20:103; KEI10:29; WCI06:187; WPI04:171,297
7 KEI08:47

"has had a huge influence on what I do because … I realised that people learn in different ways."[1] They also consult books about supervision.[2]

Institutions offer little in the way of formal training in supervision although it is becoming more common. At UCT staff are invited to participate in the "new academic practitioners programme" and the "emerging researchers programme"[3] which give some information about supervision. At Wits, supervisors are provided with a supervision handbook and supervision workshops are run by the Centre for Learning and Teaching Development (CLTD), although these are poorly attended.[4] Similar initiatives are planned at UKZN. But several of the supervisors were skeptical about the value of training in supervision and critical of institutional initiatives to improve supervision.[5] They say that "it's nothing a course can teach you"[6] and that some people "are naturals"[7] and don't require training.

Much of supervision is tacit knowledge which can only be accumulated with experience. A supervisor says, "you develop a sense of where it's going wrong and where it's not, I can pick it up immediately, and that kind of expertise is not something that you can learn, you know, it's experience."[8] But another says that "one doesn't have to have the experience first hand." She suggests that supervisors "get together with other people who have the experience and discuss what worked for them, what didn't work for them."[9] Another suggests the need for "a coffee room with high tables where you can sit around and talk about things and in the process, learning happens."[10] A new supervisor confirms this view:

> *I've been thinking about it a lot recently because I've just started on this process and there are a lot of nuances, a lot of complexities to the whole thing. I mean, you pick up information about how other people are doing and you hear about other people's experiences but there's no explicit … just, maybe just a place where you can discuss it, you know. (KEI09:131)*

1 WPI04:23
2 WCI05:139; WCI09:187
3 CMI23:75,79
4 WGO01; WGO02; WGO04
5 WPI05:53
6 CMI15:235
7 CMI10:175
8 WPI04:115
9 KEI13:141
10 WPI05:59

The activities and artefacts of doctoral education

Supervisors make use of a range of activities and artefacts in the process of supervision. Across all the case studies, writing and the review of written work is important. At some point supervisors ask for written work saying, "I then like the student to write"[1] or "I want to see how this is put together, even in ten pages"[2] or "just write something."[3] Handing in written work triggers meetings, "OK, I'm handing this in, when are we going to meet?"[4] And the text is used to focus the discussion in supervision meetings.[5] Having to write makes the PhD person read[6] and means that "you don't just read a paper; you write down what you've read."[7] This results in a "body of text" to draw on over the course of your studies.[8] And writing develops understanding: "Sometimes a student will come to me with a question, I'll say, 'Just write something out for me and then we'll talk about it.' As soon they've written up they say, 'Ok, well it's ok now.'"[9] In addition, having to submit work provides a tangible measure of progress in what can otherwise be a very open-ended process.[10]

Table 6.2: Activities and artefacts of doctoral supervision

- Pieces of written work
- Undergraduate or master's courses
- Supervision meetings
- Journal articles
- The literature / literature review
- Supervision agreement or contract
- Research proposal
- Doctoral seminars
- Journal club
- Client meetings
- Research papers
- Conferences
- Research seminars
- Progress reports
- Drafts of the thesis

Kamler and Thompson have observed that, "researching cannot be separated from writing" (Kamler & Thompson 2006:11) and across the case studies, people reflect on how writing is an important part of thinking. One person says, "sometimes I think that, 'Ah, it's very clear',… and when … I try to write the point of what I thought was very clear, then I see that, no, I missed some things."[11] Writing helps to identify "the gaps"[12] and to "model what my thesis will

1 WPI09:99
2 KEI02:129
3 WPI12:479 also KEI05:64; KEI13:169; WPI04:105,231; WPI14:82; WPI15:137
4 WPI14:82 also KEI13:169
5 KEI10:61; KEI13:169; WCI03:81
6 WPI01:212 also WPI04:97,105
7 CMI21:59
8 CMI21:59
9 WCI05:107
10 CMI21:55; KEI06:67; KEI13:67; WPI12:19; WPI15:137
11 WCI06:283 also WPI04:231; WPI12:479
12 WCI02:151

look like."[1] As well as developing writing skills,[2] these exercises reveal epistemological assumptions,[3] make people engage with the academic discourse[4] and help to establish a scholarly identity.[5] But for this, PhD people must engage with the process. A supervisor says that she has learned not to use "track-changes mode" in the word processor, "you have to write it out so that they have to spend time correcting things and improving things."[6] These intermediate pieces of text, which may or may not become part of the final thesis, are prominent artefacts of doctoral supervision.

Mathematicians make use of *problems* in the same way that other disciplines use writing and text. Problems are central to the work of the mathematician, as this PhD person explains: "If I get a problem, I can solve it within six months, but getting a problem that is worth a PhD can take me two years."[7] Supervisors suggest problems for PhD people to work on[8] while they develop skills in identifying and posing problems: "As you are more exposed to the work, you start having your own ideas."[9] The supervisor's role then becomes "ensuring the problem looks doable."[10] Problems become the focus of supervision meetings in the same way that text does in other disciplines. A PhD person says, "I would sometimes think about solving a problem a particular way and he would say, 'No, no, no. You don't have to do that because …' "[11] and a supervisor says, "you allow the student essentially to talk about the problem."[12] Problems also stimulate further exploration as this person explains.

> *I actually spent 6 months researching background which I didn't know before. I mean, the problem didn't really require me to understand the background, it was a case of solving the equations; but I found a lot out from it when I did have time to go read up on the background. (CMI13:67)*

Later in the process, the thesis becomes a focus of activity but supervisors have different understandings of how they should engage with writing the thesis. For those in English studies, there is more concern about the style of writing, learning to "write in a way that's got

1 WCI06:83
2 KEI03:110; KEI05:64; KEI10:27; WPI09:29; WPI10:97
3 WPI03:63
4 KEI08:43; WPI04:83,105
5 WPI03:175
6 CMI22:39
7 CMI02:40 also CMI16:206; CMI11:103
8 CMI01:153; CMI05:139; CMI07:63; CMI12:159
9 CMI14:159-163 also CMI05:67; CMI09:72; CMI14:247
10 CMI09:36
11 CMI07:68
12 CMI09:36 also CMI12:65

a cogency and a pull, that's not just flat."[1] Others are more concerned with helping people express themselves. A supervisor explains that, "post-grads throughout the university, are predominantly non-first-language-English speakers of English, and yet are compelled to write a thesis in English" and "people always think that will be a matter of correcting their concords and their prepositions … but the most serious problem is that they are unable to do justice to their own meanings."[2]

Statements about supervision suggest that the supervisor should comment on the "construction and form of their thesis."[3] One supervisor considers the content of each chapter asking, "What exactly are you going to do in the introduction? In order to write chapter one, where are you going, what are you looking at?"[4] Another will look at the structure and flow of the writing:

> *…especially in the early chapters, I never simply edit … I edit quite heavily, but not at the level of grammar, especially because most of them can do that anyway; but say in taking a part of a piece of writing and saying, "This works much better if it's moved here." So you've got your star and your circle and go to page whatever. So it looks a bit eviscerated by the end, but I think it hangs together and moves along much better when I've done that kind of thing. (KEI02:129-131)*

Another person says that "you end up ... not copy-editing so much as rewriting chunks, because there's a conceptual kind of scatter that you've got to pull together."[5] But others suggest that for a master's thesis they would "take a draft chapter, read it, correct it, point out errors, make lots of marks," but at the PhD level the candidate is expected "look after those things herself; grammar, style, and so on."[6] One supervisor is irritated by "stupid issues, 'Prof, should I put this in this section?', and I say, 'you're writing the bloody thing, you should know.'"[7]

Seminars which bring doctoral people together to discuss their research are another activity in common use. Supervisors say that "in actually presenting, the student has to think

1 KEI02:131
2 KEI01:9
3 WPD04:9 also WCD04
4 KEI07:25 also WPI09:85
5 KEI08:45
6 WPI15:53
7 WPI09:131

beforehand very clearly about their research plan"[1] and they learn to "convey [their work] in another way."[2] Seminars prompt other activities: "It meant that each one of them had to produce something in writing … but then the discussion was the important part of it, the discussions would go on after the seminars in the corridors."[3] The doctoral seminar,

> *…lets people respond to the way you're writing. The fact that you have to read other peoples' work, you read theirs. It allows for people to share ideas and to also help improve the individual's writing abilities and also to show interest in [their work]. And it provides a more casual context than the staff [research seminar] or a conference. (KEI03:98)*

Supervisors also make use of other activities. They suggests books to read and courses or seminars to attend in order to address areas of weakness or develop specialist knowledge.[4] Some suggest that individuals teach or tutor a course in order to ensure their familiarity with the content.[5] They encourage doctoral people to publish,[6] invite them to research seminars,[7] introduce them to experts and potential collaborators,[8] and facilitate their attendance at conferences.[9] And they refer their supervisees to a range of experts to assist them with subject knowledge, using technology, research methods or writing.[10]

The institution's and academic unit's rules and procedures for doctoral education and the artefacts required by them can form the basis for supervision practice. The research proposal which is required for registration by all three institutions, is a case in point. At the most basic level,

> *…the proposal has to display whether the student has been able to identify a research focus rooted within a gap in the extant literature on the subject, a set of sharp analytical questions framed by the conceptual literature, and a research methodology that is congruent with the study's main questions. (Fataar 2005:51)*

But the extent to which this is possible depends on the discipline. In some disciplines, the process of writing the proposal presents opportunities to explore the existing state of

1 CMI22:231
2 KEI05:64
3 KEI10:61
4 CMI01:85; CMI12:61; CMI20:155; KEI10:24
5 WCI06:71; CMI08:91; CMI23:31
6 CMI03:64; CMI09:148; CMI12:207; CMI17:252; CMI20:207; CMI22:123; KEI02:175; WCI09:163
7 CMI19:203; KEI05:114; KEI10:69; KEI08:83
8 CMI10:167
9 CMI14:135; CMI18:265; WCI01:221; WCI02:195; WCI03:57; WCI09:163; WCI10:151
10 CMI01:85; CMI11:131; WCI04:151; WPI04:135; WPI14:106

knowledge,[1] identify gaps in the literature,[2] align the research interests of the PhD person and those of the supervisor or research group,[3] "shape their ideas"[4] and to conceptualise the research project.[5] Having to produce a proposal teaches one the art of crafting a research question, "it's like a slippery eel, you keep having to come back to that research question"[6] and makes one seek out one's supervisor for ongoing discussions and clarification.[7] It is also a trigger for scheduling doctoral seminars as people present their work.[8] Sometimes the proposal becomes part of the thesis, as in public management where, the long proposal is "essentially the first three chapters … of your dissertation, that's their conceptual framework, their literature review, their methodology"[9] and for others it "acts as your map" for the research.[10] And for supervisors, developing the proposal is an opportunity to get to know their supervisee because "going through that process with them … you learn a lot about what kind of supervision that person is going to need."[11]

But for mathematicians, and particularly pure mathematicians, the proposal can be "just a sketchy thing, about the area that I'm looking at."[12] Rather than being used to facilitate learning, the proposal meets an administrative requirement for the faculty to have a title[13] or to access funds.[14] This is because in pure mathematics, it is not possible to say in advance what results will be obtained, only the area in which the research will be carried out. As a supervisor says, "Of course one has an idea, but where one finds the results is difficult."[15] However, for those in applied mathematics who model biological and financial systems, there is more scope for producing meaningful proposals[16] and some supervisors do make greater use of the proposal. One woman is critical of being able to "write a scrappy proposal"[17] and asks one of her supervisees to "put together a more detailed proposal."[18] A supervisor in civil and environmental engineering, where the proposal is also largely viewed as an administrative

1 CMI02:38; WCI06:79,87
2 WCI03:93
3 CMI01:63
4 KEI10:11 also WCI02:147
5 KEI10:10,25; WPI04:175
6 WCI02:115
7 WCI05:123; KEI09:95
8 KEI05:88, WCI03:143, WPI10:13
9 WPI04:175
10 CMI01:71
11 KEI10:11
12 CMI16:116 also CMI04:83; CMI22:231
13 CMI07:104; CMI10:103
14 CMI01:67; CMI22:235
15 CMI17:168
16 CMI01:71; CMI04:83; CMI19:71; CMI22:235
17 CMI22:231
18 CMI22:235

hurdle, is concerned that "we are too superficial on the proposal side"[1] and asks for a second "proposal for the thesis, not a proposal for the faculty."[2]

The ways in which individual supervisors approach doctoral education reflect their views of the PhD. Those who adopt the scholarly view that the PhD is about doing research and see PhD people as "members of an elite" (Johnson et al. 2000:138), expect greater self-sufficiency and see their role as guiding the research process[3]or to "just monitor what's happening."[4] These supervisors argue that "some students are very independent and will manage in spite of their supervisors, but others will need guidance and help every second day"[5] suggesting by their irritation that it ought not to be so. Supervisors who favour the ongoing development views are more likely to see supervision as "a training role"[6] and be willing to consider "spending time and actually showing when necessary, this is how I want you to write."[7] A supervisor explains her role as:

> *I suppose a kind of critical friend, someone who kind of looks at the stuff and says, "This is working, this isn't." … But I say a critical friend because I think it needs to be a developmental engagement, not critical in the sense that "you don't know what you're talking about, go and re-do it"; but a sort of … maybe a mentor. (WPI14:78)*

And some supervisors work between these views suggesting that PhD people should be "independent and self-directed in an environment of support."[8] The only attention which supervisors pay to the labour market discourse, is in relation to academic careers, suggesting activities to expose people to aspects of academic practice and assist them in developing their research careers.

Innovation and change

Sometimes supervisors introduce new activities. One who believes that a broad understanding of the research field is important, has implemented a series of seminars focused on transmitting content knowledge.

1 WCI05:35
2 WCI05:43
3 CMI19:71
4 CMI10:167
5 CMI10:167 also KEI01:75
6 CMI18:261
7 WPI09:85
8 WPI04:169

> *I run this "topics on string theory" seminar series. It's a two hour lecture on Tuesdays and Thursdays, and every semester we pick a specific topic and we just study that topic. This semester we're learning group theory; which you would think that most of the students here would know, coming from undergrad, but they actually don't. So we'll spend the semester learning about groups and representations. … Basically I've accumulated a list of things that I wish I'd known when I was doing a PhD. If they're learning two topics per semester, that's a bunch of topics that they've covered for the duration of their degree. (CMT13:56)*

These seminars are not formally constituted and there is no requirement that PhD people attend, rather they are given and attended because of a mutual interest in the work. The supervisor undertakes this additional teaching because "it's something that's absolutely necessary for my students" and "if it doesn't get done then I have students that take too long to do their degrees."[1] Another supervisor started a "journal club" in which she meets with her six postgraduates once a week for an hour. They are each assigned a journal to monitor and they take turns in presenting and critiquing papers from that journal. The meeting is used to develop presentation skills, to familiarize them with current research and the journals that they should be publishing in, and to discuss their own work and progress. She says that, "It's just a nice opportunity to get a lot done in a short time with all the students."[2] These innovations are in response to increasing numbers of doctoral people who arrive with divergent sets of prior knowledge and while they entail additional work, are seen to reduce the supervisor's workload in the long term.

Supervisors introduce innovative practices because of their own experience and strongly-held views about what doctoral education should be. Here a supervisor reveals her bias towards the ongoing development perspective of the PhD:

> *I was a very poor student at school, but I developed very good meta-cognitive skills when I got to university and the intelligence part of it became less important … and I ended up being up much more successful than people who were at school with me who did much better at school… so that definitely affected what I do, because that's what I emphasize with students, I emphasize their meta-cognitive skills more than intelligence. It's not to say that I don't think you need to be intelligent, but I just think that there are some very bright people who actually don't make it because of their poor meta-cognitive skills. (WPI04:7-9)*

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1 CMT13:56
2 CMT07:27

This recognition of the potential of a wider range of people to succeed in doctoral studies leads to a greater emphasis on activities that make explicit the requirements of the doctorate and develop meta-cognitive skills.

However, such innovations depend on the initiative of individual supervisors and the effort which people are prepared to devote to doctoral supervision is influenced by the recognition and rewards which they can expect. Supervision is often not explicitly accounted for in the allocation of work to academic staff,[1] and with increasing workloads one supervisor is "scaling down" the frequency of supervision meetings.[2] Another says that "the rewards for PhD supervision are not as great as for master's supervision."[3] Supervisors do get financial benefits for the number of PhDs that they successfully graduate,[4] but the suggestion was made that this encourages people to take on more supervisees and pay them minimal attention.[5] Another senior staff member opts not to supervise saying that he would rather spend time on his own research because the rewards for publication are greater.[6]

Supervisors also observe and learn from what is done in other academic units. A supervisor in English studies says, "I think we've got a lot to learn from the sciences, actually" and expects to have to "think things through; more the way the sciences [do] than our practice has been in the past."[7] And someone in the engineering faculty says:

> *In science, and I've been on some of them, each student has a committee. So there's the supervisor and the head of school is on every student's committee, and one or two others, and I have seen there, that when they present their proposals, frequently it's turned back. They've said, "Try again, you're not there." And that can be after a year, and that's fairly normal, and it's not regarded as being onerous. (WCI05:35)*

Some of the changes which they are suggesting would need to be made at the level of the unit, rather than the individual supervisor. But as Golde observes, there is often a lack of coordination in efforts to improve doctoral education.

1 CMI18:165-177; CMI23:121
2 CMI12:65
3 WPI04:157
4 CMI15:211
5 WPI05:55
6 KEC01:2
7 KEI10:30

> *Individuals and departments who organize and implement graduate education programs are, for the most part, thoughtful and committed to creating a high-quality education for their students. Nevertheless, program development often takes place without collective deliberation and documentation, and may rely more on tradition than on a shared vision of the purpose of doctoral education. Consequently, the practice of doctoral education advances more slowly than is necessary and can be out of synch with the developmental needs of students. (Golde 2006:8)*

While much of the innovation in supervision observed in this study did indeed take place "without collective deliberation," there was evidence of more coordinated efforts. In civil and environmental engineering, the practice of presenting proposals to "a small committee"[1] had been introduced. The requirement is considered onerous "because we now have to be on everyone's committee," but it is valuable because "it is now going through an assessment a little bit broader than the supervisor himself."[2] In English studies, "more rigorous parameters are being put in place by the higher degrees committee and the research office."[3] There is a concern to "standardize the expectations which the candidates have a right to."[4]

In public management the doctoral programme changed in response to the kind of people who enroll for the PhD. These people "change fields; they'll come in as a medical doctor or an agriculturalist, or teachers, people from water departments, who are specialized scientists … and they're moving into management"[5] and "they sometimes have ten years in between this and their previous degrees."[6] So the school introduced the social theory course in order to give them a perspective of "research over time."[7] In this school each candidate presents two proposals and the thesis to a review committee who critique the work with the emphasis on, "What can we do to fix this at this point?" The approach means that "fresh eyes" look at the work, revise and improve it.[8] Opponents of the review process say that it allows people to devote less time to their supervision,[9] but others argue that omitting the review, "because there are a lot of people who think it's a waste of time," leads to revisions and delays.[10] Such

1 WCI08:11 also WCI05:35; WCI09:131
2 WCI08:35
3 KEI02:243
4 KEI01:137
5 WPI04:41
6 WPI04:95
7 WPI04:95
8 WPI04:181
9 WPI09:91
10 WPI04:181 also WPI15:137

processes introduce new divisions of labour as people become readers for PhD people other than those whom they supervise.

The supervision contract is another procedural requirement of doctoral education which is becoming entrenched in departmental practice. These contracts, agreements or understandings seek to replace tacit understandings that, for example, supervision meetings will take place regularly, with explicit rules. Supervisors and PhD people have mixed feelings about these documents. Some make use of them to initiate discussions and set expectations,[1] while for others, "I see it as a formality, and I'm only doing it because I have to."[2] These different responses point to the difficulty in entrenching social practice. While rules can be established, the particular ways in which individual supervisors adopt the practice will vary.

The actions of individual supervisors can be extremely destructive. One PhD person recalls: "In doing my master's, the proposal I gave in … was literally thrown into the dustbin in front of my face, and it put me off for years."[3] But there is room to manage the destructive effects of unsupportive behaviour in a social setting as this supervisor explains:

> *You still get people who operate in that old-fashioned academic sort of way, which is about, "Okay, you write a chapter and I'll see if I can tear it apart." And it's a problem sometimes, with the committees, because you'll get academics who come along just to nit-pick, or show how clever they are, and it's very undermining to the student. So they need to be well-chaired and supervisors also need to sort of protect their students … from academics who are point-scoring, rather than actually helping. (WPI14:53)*

By entrenching the practice of supervision in departmental rules and introducing new divisions of labour, supervision becomes more public; academics can monitor and influence the actions of their colleagues, and the PhD person is less dependent on the "dyadic relationship of supervision" (Malfroy 2005a:165).

Constraints

While supervisors construct their own practice, what they do is constrained by other elements of the system, like how people are funded and by societal rules and conventions. For example, funding for doctoral study is increasingly being provided as part of funding for

1 CMI03:64; CMI09:220; CMI22:203; KEI13:125
2 CMI12:163 also CMI15:331
3 KET11:48

commissioned research projects.[1] In these cases, there is less opportunity to engage the PhD person in the design of the research. A supervisor in civil engineering explains:

> *In order to fund a PhD and in order to have a research student or a research officer, means you have to have secured the funding first. Which means essentially, you have to have said what you're going to do, and then you say to a PhD student, "This is what we're going to do. Come and do it." And I think that takes a lot of the value out of the PhD. (WCI05:31)*

Some supervisors felt that writing a thesis was not the most appropriate way to develop and assess PhD people or to make their work public. In English studies, some favoured producing a book or monograph,[2] and some applied mathematicians felt that publishing a series of papers would more accurately reflect the practice of knowledge production in their discipline.[3] However, changing this tradition is likely to be a long process.

In the case of public management, although the social theory course has been made compulsory, it has not been possible to register the course at the PhD level because both the institution and the national accrediting body (SAQA) do not recognise PhD courses.[4] Instead the course is designated as a master's course and people complete it before they register for the PhD. During this time they are not officially registered at the institution and special arrangements have to be made for them to access facilities like libraries.[5]

In all the case studies doctoral education was becoming more formalized and while rules constrain the ways in which individuals supervise, they also remove some of the uncertainly. An older supervisor explains:

> *It was a lot more a case of amateurs at work when I began. People had a real enthusiasm for what they were doing, … but the understanding of how you collaborate, how you refine a research proposal, a research interest, had not been formalized … and gradually, with the establishment of a research office in the university and a higher degrees committee and formulation of research proposals and so on, all that, which can be quite tiresome at the moment, is a huge help. (KEI10:10)*

1 KEI10:30; WCI05:31
2 KEI08:209; KEI13:233
3 CMI03:60; CMI18:73; CMI19:283
4 WPI04:185; WPI05:19
5 WPI05:19

From this discussion it is clear that the practice of doctoral education is constructed by each supervisor with a wide a range of activities and artefacts being employed in the process. Practice is informed by past experience, disciplinary research practices and the needs of PhD people; it relies on the initiative and energy that individuals bring to their work, and the extent to which they feel motivated and able to innovate or change practices; and it is both enabled and constrained by the institution's and academic unit's rules and procedures for doctoral education. But can the practice be described only at the level of the individual supervisor, or can patterns of practice be discerned? This is the subject of the next section.

6.4 Patterns of practice in doctoral education

Chiang compared the experiences of doctoral people in chemistry and education departments in British universities, and identified two "research training structures" – the *teamwork* and the *individualist*. The teamwork structure is one in which "doctoral students and their supervisors work on the same research projects" (Chiang 2003:17), while the individualist research structure is one in which PhD people work on their own projects, unrelated to the research in which the supervisor is engaged (Chiang 2003:18).

These different structures were found to influence the research environment, the relationships between supervisor and supervisee, and the procedures and experience of doctoral study. For example, in the teamwork structure research topics are often allocated by the supervisor as part of a larger research project; PhD people work as junior but full members of a research team which includes senior and junior staff and post-doctorates; and all members of the team share resources. By contrast, in the individualist structure, PhD people are expected to select their own research topics; they are not regarded as members of the research community; and they work in isolation with access to fewer resources. Chiang related the different research training structures to the nature of knowledge and the processes of knowledge generation in the different disciplines. Knowledge in chemistry is cumulative and requires convergent thinking and collaboration, while education "calls for a divergent way of thinking to progress itself" (Chiang 2003:19).

In this study I was able to detect four *patterns of practice* in the ways in which supervision and research activities were organised. But the practices were not as uniform as Chiang's research training structures, both within and across cases. Chiang's individualist structure was evident in all of the case studies, where I found individuals working on their own research in isolation. However, I also identified two variants on the individualist structure: *networked* and

loose cohort. There were no examples of the teamwork structure, however a variant of this structure, which I call the *small team*, was observed in three of the cases. I prefer to call these variant's of Chiang's research structures, *patterns of practice* as they are not fixed enough to warrant the term structure.

The first variant is the *networked* pattern, where people work on individual projects with their supervisors, but are part of a research group that includes other staff, postdoctoral and doctoral people. Those in the research group work in the same knowledge area or specialism,[1] convene and attend seminars and workshops together,[2] present their work to each other,[3] consult each other on their research[4] and critique each other's work. Sometimes "there are group meetings within groups" where "all the students supervised by one guy, or by two guys, get together and discuss what they doing."[5]

The networked pattern resembles Chiang's teamwork structure in that people interact with a range of other staff and students and are familiar with the research which others in the team are engaged in, but it is better characterised as individualist because doctoral people work on individual, unrelated projects. A supervisor explains: "Take, for example, the gravity group. My student works on stuff that's very, very theoretical. She has other students in the office that are working on observational stuff."[6] And a PhD person says, "at some points we do talk about work, but at the moment we're each doing different things."[7]

This pattern provides opportunities for PhD people to interact with their peers and with other members of staff, providing a supportive network which may counter some of the isolation of the individualist structure. They can get help from a range of people and are less dependent on their supervisors. For example, a PhD person says of the postdocs in his research group, "they wouldn't mind helping you debug your code or check your equation."[8] And a supervisor says of his own doctoral experience:

1 CMI01:113
2 CMI04:103; CMI07:120; CMI13:111; CMI14:183
3 CMI01:63; CMI07:176
4 CMI03:84; WCI02:132
5 CMI13:135
6 CMI03:88
7 CMI14:199
8 CMI05:35

> *I did my PhD in _____, and they put the PhD students in one big room, it was on top of the building. So there was about twenty of us in there, and that was very useful for interacting. I mean, I never asked my supervisor the sort of questions I get here like, "How do I use this package?" It would not have occurred to us. You would just ask someone who's been using it in the group. (CMI12:219)*

Networked patterns were observed in mathematics and applied mathematics and in the civil and environmental engineering case. They were also evident to some extent in public management where one person said, "We are a number of people supervised by the same person, … sometimes he calls us together and we discuss issues as a group; not specific to the research, but general."[1]

The second variant, the *loose cohort* pattern was observed in public management where people work as part of a cohort which meets infrequently, while doing unrelated individual research projects with their supervisors. Members of the cohort attend the social theory course together in their first year, but go on to work on individual research projects with their supervisors from the second year. Being part of a cohort facilitates peer relationships, but these are generally not engagements around research. People exchange telephone numbers[2] and some of them have "drifted into friendships."[3] They get in touch "to say 'Ah, how is it going with your studies?' But we don't actually discuss about the work at all."[4] But it appears that the loose cohort pattern does not result in the supportive research networks observed in the networked pattern. PhD people are largely "left on their own"[5] and when asked who he discusses his work with, one man says "right now I'm interacting with myself."[6]

There were a few full-time PhD people in this school who, on their own initiative, engaged more around research. They set up an informal forum which meets "to discuss our research, the progress and to seek criticism from each other… even those that are ahead of us, those who are collecting their data or writing up their work, we try to seek their counsel."[7] And one person points out that, in this kind of work, engagement around their research would be beneficial. While discussing her proposal during the social theory course she said:

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1 WPI10:137
2 WPI07:225,235
3 WPI06:305-309
4 WPI02:170
5 WPI04:213
6 WPI03:123
7 WPI10:101-105 also WPI08:69

> *…it was fascinating to look at how another person interpreted your work and that prompted me into thinking, "You know what? I actually need to interact more, because that's actually the public out there and that's their interpretation of my work." It's only going to add value. And also my interpretation of their work. (WPI07:225)*

There were no examples of Chiang's teamwork structure in this study. The closest resemblance was to be found in what I call the *small team* which consists of a single supervisor working with two or three people at master's, doctorate or post-doctorate level on assigned parts of a larger research project. The small team pattern appears to be a direct consequence of how doctoral studies are funded. In civil engineering for example, PhD study is "funded through contracts that supervisors bring in."[1] Research topics get assigned to PhD people[2] and they work as part of a team, engaging frequently with peers, the supervisor, and often the client, about their work. The small team pattern was observed in civil and environmental engineering[3] and in one of the research groups in mathematics and applied mathematics.[4] Somewhat unexpectedly, a supervisor in English studies suggested that this kind of funding was increasing for master's study and "so we're really at a point of change in that, and I think it's going to have to come with doctoral work as well."[5]

These patterns of supervision can be represented visually in the following diagrams, where the red and blue circles represent supervisors and doctoral people respectively, the solid lines represent relationships of shared research and the broken lines represent ongoing supportive relationships, not necessarily related to research.

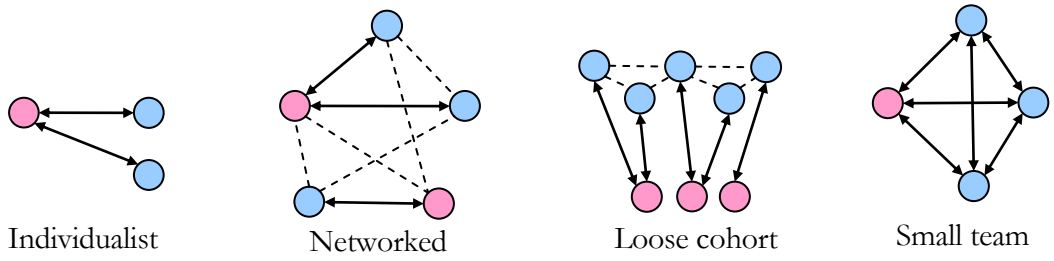

Figure 6.1: Doctoral supervision patterns observed in the study

Different patterns of practice provide varying levels of support and access to other people. The individualist pattern makes the PhD person almost exclusively dependent on the

1 WCI05:27
2 WCI05:31
3 CMI05:27-31
4 CMI04:31
5 KEI10:30 also KEI05:114

supervisor. The networked pattern provides social support and support in some of the peripheral aspects of doing research, such as getting software to work. The loose cohort provides social support, but people meet too infrequently and their work is too divergent to engage around research. Only the small team pattern seems to facilitates engagement around research or joint research while also providing social and peripheral support, making the PhD person least dependent on the supervisor in this pattern.

Chiang observed that people working in the teamwork structure had more frequent interactions with their supervisors than did those in the individualist structures (Chiang 2003:20). In this study, the frequency of meetings with supervisors was not related to whether they worked on individual research or not, rather it appeared to be based on departmental expectations and supervision workloads. People in mathematics and civil engineering have more frequent interaction with their supervisors, regardless of which pattern is in operation. But those in public management, where the supervision workloads are high, and those in English studies, have less frequent interaction with their supervisors.

A further variation which I observed was the practice of co-supervision, which replaces the individual supervisor by two or more supervisors. I have not classed this as a distinct pattern because it is employed within all four of these patterns. This arrangement is used when the project spans two or more knowledge areas and each supervisor provides expertise in a different area,[1] or where one person can contribute specialist knowledge, but cannot supervise because they do not themselves have a PhD.[2] Sometimes a co-supervisor is based in the workplace with the main supervisor in the university.[3] It is also used as a form of supervision training where a less experienced supervisor co-supervises with someone more experienced.[4] Some people prefer to have co-supervisors "because I wanted some balance … he could push a bit too hard"[5] and a supervisor explains that the arrangement can be supportive:

> *I think it's quite healthy for a student to have two supervisors actually, particularly because some of them … need a bit more mentoring. … While I'm critical of their work, I always try to be supportive as well and tell them, "You're doing great"; whereas the co-supervisor*

1 CMI19:55; CMI21:41; CMI22:7; WPI03:163,171; WCI10:47,151
2 WPI03:171
3 WCI10:151
4 WCI06:187; WCI08:237; CMI10:171; CMI18:19,213
5 CMI04:163

> *… is much more matter-of-fact, and sits down and says, "Right, this is what I think you should be doing." … So, that balance has been good. (CMI22:99)*

Co-supervision enables PhD people to draw on two supervisors and so increases the resources available to them. Co-supervision was used in all of the cases except English studies where a supervisor told me that "co-supervision is always very, very difficult, from what I've heard."[1] This reluctance to co-supervise might reflect the highly conflicted nature of knowledge in English studies (Graff 2006:371).

Which patterns of practice get used in an academic unit appears to relate to funding models, as observed in the case of the small team, and to the number of people working in a particular area. The loose cohort arrangement in public and development management was set up in response to growing enrolments while supervisors in other units say, "I don't have a big group, so it is pretty isolated stuff. In the long run, if I get in more students, they probably will be working on related topics"[2] and "If you've got a lot of students in your group, then they can interact more."[3] The following table summarises the structures which were observed in the different case studies.

	Mathematics and applied mathematics	**English studies**	**Civil and environmental engineering**	**Public and development management**
Individualist	Frequent	Dominant	Frequent	Occasional
Networked	Frequent	Not observed	Occasional	Occasional
Loose cohort	Not observed	Not observed	Not observed	Dominant
Small team	Occasional	Not observed	Frequent	Not observed

Table 6.3: The use of doctoral supervision patterns in the case studies

6.5 Conclusions

From these observations of the practice of doctoral education, two main points emerge. Firstly, while doctoral education is primarily based on individual supervision, there is considerable variety in the specific practices across academic units and supervisors.

1 KEI09:191
2 CMI09:176
3 CMI12:105

Each supervisor constructs their practice based on their own experience of being supervised and of supervising, and according to the nature of knowledge and research in their discipline. The activities and artefacts which are employed result from the discipline's research practice and from administrative procedures, and are influenced by the needs of the supervisee and by the supervisor's view of the purposes and goals of the PhD. Practice is constrained by national policy, institutional procedures and the rules of the academic unit, as well as by funding models. And what supervisors do will depend on their own sense of agency and the ways in which they are rewarded.

Four different patterns of practice were identified – the individualist, the networked, the loose cohort and the small team – characterised by the degree to which the research is independent or part of a larger project, and by the opportunities for interaction with other PhD people and academic staff. These different patterns provide different kinds and levels of support for the PhD person and the degree to which the PhD person is dependent on the supervisor differs. Which patterns are used, appears to relate to funding and enrolments.

Secondly, it is possible to observe changes in the practice of doctoral education. Individual supervisors introduce innovations in their practice in response to their changing circumstances and to the needs of their students. There is increasing formalization of the practice of doctoral education within the academic units. By entrenching procedures and often requiring the involvement of more members of the academic staff, the work of supervision becomes more visible and less open to abuse. And there is increasing division of labour in the practice of doctoral education with specialist administrators, subject experts, technology advisers and writing coaches interacting directly with doctoral people. Academic staff are also able to participate in a wider range of roles, acting as reviewers and advisers to PhD people other than their supervisees.

However, while changes can be observed, they are on a small scale. The supervisor remains responsible for much of the work of doctoral education. And the interplay between departmental practice and the practice of individual supervisors is complex and unpredictable, making it difficult to expect uniformity in behaviour. There are also systemic constraints to innovation in doctoral education and considerable resistance on the part of supervisors. It appears that there was more scope for innovation in the case study with the least entrenched disciplinary identity.

In this chapter I have focused on what supervisors do and how they construct their practice. However the practice of doctoral education is not only something that is done to doctoral people, and is not entirely under the control of the supervisor. Rather it is a practice that emerges from the interaction between the supervisor and the PhD person. I close this chapter with this description, by a supervisor in English studies, of her interaction with a PhD person whose home language is not English.

> *… of course it's really difficult for him to write in English. He has long ceremonial openings to sentences like, "It is essential that we note" – all this rubbish. And I would say to him, "No throat clearings!" He also loves the word "various" which is an absolutely empty word; "for various reasons" – get it out! Anyway, at a certain stage we were working through his stuff, and I said, "There's various again! You really are at the end." And he said, "I left it there so you'd have the satisfaction." Now that's where modern social skills are, isn't it? And I laughed. But you will also get the shrinking violet, who when I say, "No throat-clearings" will get all hurt or afraid I don't love him or something like that. So it is a very complex and close interaction of personalities, isn't it? (KEI01:79)*

Her observation of how the social skills and sense of self of the PhD person influence the supervision interaction, leads to the concerns of the next chapter, the role of the PhD person in the process.

Chapter Seven

THE PHD EXPERIENCE

The pleasures and problems of doctoral study

7.1 Introduction

Doing a PhD is like deep-sea diving:

> *… it's like first seeing water, and then going inside, deep, and discovering all this beautiful colour and all these prickly funny animals, and the beautiful… So it's like, getting into something that you don't know, like diving in and then discovering all these other different things of different colours. (WPI06:263)*

Diving in and discovering is exciting, but it may also be unpleasant, dangerous and frightening:

> *I think I jumped in deep water without knowing the deep water is not only deep, it's cold and fast-flowing. (WCI03:207)*

There are as many experiences of doing a PhD as there are PhD people. Given the variety of research undertaken, supervisory practices and circumstances under which people study; and given the different motives for studying, abilities and identities that people bring to doctoral studies; it is difficult to generalize about the experience. On the one hand, the PhD experience results from external circumstances – the environment in which one works and researches, the research and learning activities undertaken, the social interactions and the practical arrangements for study and living. On the other hand, the experience results from individual qualities – existing and imagined future identities, perceptions of abilities or limitations, and having or lacking a sense of agency. Some complex interaction of these external circumstances and individual qualities creates the unique experience.

In this chapter I examine the experience of doctoral study from the perspective of the PhD person. As discussed in chapter five, those doing doctorates work and study within a number of intersecting contexts with each person having a unique configuration of contexts. These contexts include people, locations, resources and activities that provide the structural elements of doctoral study. But they also include discourses which construct the subject of the doctoral person. I argue that contexts which are *congruent* with both the PhD

and the individual's sense of self, provide experiences which doctoral people seek out and I identify criteria for these congruences. But contexts are not static and PhD people, as agents in the system, are able to act to change particular contexts, to change the configuration of contexts in which they find themselves, or to change their own identities in search of greater congruence.

I begin in section 7.2, by considering the impact of the structural elements of doctoral education on the PhD experience. I draw on the literature and on the interviews with doctoral people to identify dominant concerns around the structure and organisation of doctoral education that impact on the experience. Then in section 7.3, I consider how the PhD-student-subject influences the experience of doctoral study. I examine the literature dealing with identity in doctoral education and consider how the identities of doctoral people in the study relate to their experiences. In section 7.4, I introduce the idea of congruence between the context and the PhD, and congruence between the context and the individual. I make use of the intersecting contexts model to illustrate how the PhD experience relates to these congruences and how individuals act to increase congruence.

7.2 Structural elements of the PhD experience

Research into the doctoral experience originated in concerns about completion and attrition rates (Bair & Haworth 1999; OSEP 1996). This research includes reflections of academic staff and academic development staff on their experiences of running doctoral seminars (Metz 2001; Page 2001; Pallas 2001) and empirical work that investigates the experiences of doctoral people (Chiang 2003; Golde & Dore 2001; Lesko et al. 2006). Studies on retention highlighted the importance of academic and social integration (Favish 2005:279; Humphrey & McCarthy 1999) and suggested that the environment encountered by doctoral people in the academic departments they study in, is often a key factor in their decision to leave graduate studies (Lovitts & Nelson 2000). The cultural and social aspects of doctoral programmes have a substantial impact on the PhD experience (Deem & Brehony 2000:149) and a review of research into attrition and persistence in doctoral studies concluded that "departmental culture affects doctoral student persistence" (Bair & Haworth 1999).

The experiences of doctoral study range from confusion, "students do not understand clearly what doctoral study involves, the process or how to navigate it effectively" (Golde & Dore 2001:3), to "experiences of isolation, rejection and 'hideous self-doubt' that 'never

goes away"' (Lee & Williams 1999:15). In other cases, the experience was positive, persuading people "that doing research is a compelling activity" and led to more enthusiastic engagement with research activities (Page 2001:23). There are very few South African studies that focus specifically on the experiences of doctoral students. At the University of the Witwatersrand an institutional culture survey, directed at staff, includes comments about student experiences (Wits 2002a); experiences of master's and doctoral supervision at the University of South Africa (UNISA) have been investigated (Lessing & Schulze 2002); and Jansen, Herman and Pillay identified a "'jarring' … between conflicting cultures" of the work and academic environments among doctoral people in education at the University of Pretoria (Jansen et al. 2004:99).

Doctoral people work and study within a number of contexts each with their own cultures – including those of the workplace, the academic discipline, the research group and the peer cultures of research postgraduates. These cultures can be understood as "the collective, mutually shaping patterns of norms, values, practices, beliefs and assumptions that guide the behaviour of individuals and groups … and provide a frame of reference within which to interpret the meaning of events and actions on and off campus" (Kuh & Whitt 1998:12-13), and they may be complementary or contradictory (Abdullah 1996; Kuh & Whitt 1998:46-52). These cultures include understandings about knowledge, "what counts as a relevant contribution, what counts as answering a question, what counts as having a good argument for that answer or a good criticism of it" (Becher 1989:26); so that the cultural aspects of doctoral programmes include epistemological positions, cognitive approaches, social structures and practices.

A significant and consistent theme in the literature is the different experiences of doctoral study in the sciences and in the humanities (Baird 1990; Becher & Trowler 2001; Chiang 2003; Smeby 2000; Wright & Cochrane 2000). The PhD experience in the sciences appears to be less problematic. People work on research that is closely related to that of their peers and supervisors, meeting frequently and using shared resources. They are considered to be colleagues and feel that their research is valued. In the humanities, research topics are more often unrelated to the work of peers and supervisors, people work in isolation, experience greater distance and hierarchy and feel that their research is not valued (Chiang 2003:19-23). Doctoral degrees take much longer to complete in the humanities (Wright & Cochrane 2000) and research that reflects the experience as traumatic or horrifying is based in the humanities (Lee & Williams 1999; Lesko et al. 2006).

Table 7.1: Structural elements that affect the PhD experience

1. Good supervision
2. Opportunities to engage around research
3. Learning processes and activities
4. Opportunities for social and emotional support
5. Resources and funding
6. Sacrifices and lifestyle compromises

PhD people are advised to select an academic department which has "a vibrant research culture" (Mouton 2001:11) and several authors make reference to a good research or department culture (Bair & Haworth 1999; Studman 2003:19; White 2004:238), but there have been few attempts to define what makes such cultures good. Elements of a good research culture that are mentioned in the literature include high academic standing of the department and faculty (Leonard 2001:99-100), staff members that are active researchers (Studman 2003:20), a research environment of community and collegiality (Porter 2004) and processes to include doctoral people in faculty research activities and networks (Christiansen & Slammert 2005:1053; Leonard 2001: 102). In addition to having good supervisors and opportunities to engage around their research, people in this study identified the learning processes, opportunities for supportive social interactions, and access to resources and funding as important in their PhD experiences.

Good supervisors

Here a PhD person describes the motivating effect of working in a community of top researchers.

> *It seemed to be really at the cutting-edge. One of my clearest memories was: you walk down the passage, and you would see the same two people standing at the doorway talking about something and every day you'd walk past, they'd just talk for fifteen minutes in the morning, and every day when you walk past you'd catch a little of the conversation. Literally four days later, they'd posted that article on the archive and I was like, "Wow, now that's how it should be done." And it seemed like there was just such a wealth of ideas, and there was such experience, with the senior members that there was the right balance between, lots of bright-way-out ideas, but the experience to say, "That one is worth pursuing. That one, I don't think is going to work." And it … has that kind of energy. It spurs me on a lot. (CMI05:27)*

Having research going on around you is motivating and supervisors who are active researchers are valued because they are better able to direct you into appropriate research

areas,[1] guide you through the current literature,[2] advise on research methods[3] and introduce you to other experts and potential collaborators.[4]

The supervision relationship has been the subject of much research and supervision has been established as the most important factor in perceptions of the PhD experience (Dietz et al. 2006:86; Frame & Allen 2002:100; Rugg & Petre 2004:32). The relationship is often based on intellectual engagement. Doctoral people say, "I like his way of thinking about things"[5]; she "has got fantastic ideas"[6]; or that he is "just one of those people who knows so much about so many things."[7] They expect their supervisors to be sounding boards to discuss their work with.[8] Many referred to the role of the supervisor as a guide,[9] with a particular responsibility "to identify where you've gone off at a tangent"[10] although wise supervisors allow you to explore tangents as part of the learning process.

> *He allowed me to pursue trajectories even though, if I reflect back, he probably knew that was a cul-de-sac. He said, "Go there, let's see." And then I came back a bit sheepishly and said, "No, no, that's not going to work." And so it's part of the growing process. (WPI15:71)*[11]

But they also emphasize the need for support and mentoring. When asked to describe his relationship with his supervisor, a mathematician says:

> *It's very good, it's very good. He is so supportive. … And he is one person who can encourage you. Sometimes this concept, I don't really understand it, but he doesn't discourage you. He appreciates the little that you know at that time and encourages you to go and look. And if he thinks it necessary to maybe explain a few things, then he does that. And I'm impressed with the relationship, ja. (CMI02:84)*

1 CMI06:139; CMI09:16,36; CMI11:159; CMI12: 76; CMI19: 34; CMI21:51; WCI01:77,169; WCI06:115; WPI15:53
2 CMI02:128; CMI05:143; CMI07:144; CMI08:127; CMI10:167; CMI19:34; CMI21:51,55; KEI04:52; KEI13:117; WCI01:169; WPI15:53
3 CMI07:68
4 CMI07:152; CMI10:167
5 WCI02:167
6 KEI06:67
7 CMI21:47. Also KEI03:110
8 CMI07:132; CMI09:36; WCI04:147; WPI06:143
9 CMI02:88; CMI05:143; CMI07:144; CMI08:127; CMI11:143; KEI06:112; WCI07:239; WCI10:207; WEI02:56; WEI03:73; WPI03:79,175; WPI07:171; WPI08:93; WPI11:74; WPI15:53,87,131
10 KEI04:48 also KEI03:110; KEI11:82
11 Also WPI06:143

Several people mentioned the need to trust that the supervisor knows what they are doing,[1] even when their advice is cryptic, as this person working with an eminent scholar describes.

> *My supervisor is very abrupt, he gets very short time periods for you, but he's obviously quite insightful with his advice. So sometimes I feel like I'm in a kung-fu movie and I don't quite understand why he's making me run up and down the stairs, but I hope it fits in, so I try. I take seriously what his suggestions are because I do see where he's coming from. (CMI05:31)*

Many in this study appear happy with the supervision they get.[2] They speak highly of their supervisors as "very cool… inspirational, supportive and all that"[3] and "the best supervisor in the world."[4] Some told tales of neglect[5] and disagreements between co-supervisors[6] that they had experienced during their master's degrees, and tales of supervision disasters which they had heard of second-hand.[7] There were cynical remarks about the practice of supervisor names appearing on student publications[8] and suggestions that supervisors sometimes act selfishly in suggesting research directions[9] and one person complained that his supervisor took three months to reply to e-mails.[10] But otherwise people did not raise significant problems with supervision.

Doctoral people recognise that supervisors can't be all things to all people. They say for example, that not all supervisors are suited to a mentoring role and that it can be filled by a co-supervisor, a post-doctoral fellow or another member of staff.[11] And that "you can't expect every supervisor to be the same – like always energetic about things and always have time for students or always paying attention to students."[12] PhD people in this study did not expect their supervisors to be superheroes and felt that the relationship between the supervisor and student should not get too much focus.[13]

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1 CMI15:111; KEI10:15,84; WCI04:239; WCI08:205; WPI15:71,87
2 CMI14:56; CMI21:43,47; KEI03:110; KEI04:37; KEI06:67; WCI01:165; WCI02:167; WCI03:175; WPI11:64
3 CMI14:56
4 WCI03:175
5 CMI07:68; CMI14:211; WCI04:187
6 CMI21:182
7 CMI08:143; KEI04:47
8 CMI08:199; CMI11:143
9 CMI05:139
10 WPI02:270-290
11 CMI19:34-38
12 CMI14:211
13 KEI04:58

Opportunities to engage around research

> *What are the things that helped me get through my PhD to this point? I'd be completely lost if I didn't have quite an outgoing personality and I found it easy to approach my peers, PhD students, post-docs, other lecturers. I think it's important for students to be proactive in that sense. I've never found a lecturer that hasn't responded to an e-mail, or been willing to see me if I have a problem. So I think that's something that should be instilled … for some people it's quite difficult, but it's certainly helped me a great deal. (CMI05:183)*

A good research culture includes multiple opportunities for people to engage around their research. A supervisor explains that discussing research in the academic context is important: they "need to be involved in the discourse because … the minute they … become part of our discourse community, they're able to take on the language, take on the writing practices much more easily."[1] One professor is able to create an active research group around him, greatly improving the experience of his postgraduates.

> *When my first professor was here, actually it was very good, because it was a research group. When I came first year, we were about five in the research group, and we frequently meet and we discuss our stuff – I mean, before we go for presentations, so we knew what each other was doing. And we used to share a office together, so we get any problems, we discuss among ourselves, but now, since that one left, I'm not in anybody research group so, everything is on my own. (WCI07:229)*

But PhD people find some forms of engagement more helpful than others. They were enthusiastic about attending "useful" seminars within their research groups, but found more general seminars less exciting,[2] although "when you go for seminars, you get exposure to different things, that's the good perspective of it."[3] Attending staff research seminars can be frightening[4] and not always helpful as these two stories show.

> *I tend not to derive too much out of it, because I'm constantly looking out for the authority figures. Sadly, in my understanding and my experience, [that's the] the way the English departments have always operated. When I was in the English department and*

1 WPI04:83
2 CMI08:75; CMI13:111,123; CMI14:203
3 CMI14:203
4 KEI07:104

> *I was tutoring, it felt like I was still ... not exactly important enough to be spoken to. (KET11:83)*

> *I thought, "Let's draw PhD students in and then they present as well." It happened once or twice. The one was a disaster because the collection of doctors and professors took out their scalpels and proceeded to slice up this unfortunate person. It was traumatic for her. I don't think she's recovered. Big disaster, really.(WPI15:201)*

Interactions with academic staff are more satisfying for PhD people, if they are treated with respect. One person complains sarcastically about the academic staff in another department, who adopt a patronising attitude: "We are the professors, we know a lot; you are the students, you do not know a lot. We like you, we are going to teach you." and contrasts this with an environment where "everyone gets considered an equal at the table."[1] But the sequel to the second story above shows that a PhD person who is a bit more confident and aware is able to manage the research seminar to her advantage.

> *The other one, more confident, made a presentation and she was quite open, she said, "Look, there's a problem with my methodology. It goes like this. What do you think?" And they all rushed forward, the professors, to solve the problem for her, and the one was fighting the other to get the air-time. Beautiful, lovely, very clever. She solved the problem. (WPI15:201)*

Opportunities to discuss research can also be provided by post-doctoral fellows who are sounding boards and sources of information for doctoral people.[2] And PhD people are enthusiastic about attending conferences and opportunities to collaborate.[3]

Doctoral people can also create a more exciting research environment. In the mathematics and applied mathematics case study, several respondents made reference to postgraduate seminars which ran for some time in the department.[4] Here is the account of the person who initiated them (then a postgraduate, now a supervisor). He says:

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1 CMI21:139

2 CMI03:142; CMI06:115; CMI23:105

3 CMI07:120,152; CMI11:215; CMI14:135,239; KEI03:86; KEI09:219; KEI11:133; WCI01:221; WCI10:151; WEI03:69; WPI01:132; WPI02:206; WPI07:207; WPI11:48,72; WPI15:199-201

4 CMI11:91,179,223; CMI19:183-187,195; CMI23:37

> *So we started up this graduate student seminar series, a half an hour thing every week, two fifteen minute talks, no preparation, just stand in front and tell people what you're working on. And then it became a social thing and all the students were coming every week. And then students decided, oh they could actually use this to practise speaking. … One student had a conference to go to in France and for three weeks in a row, she gave the same talk and got feedback from the students. And she gave this great talk in France at the end and got some award for the best PhD presentation, but it was feedback from the students. … The point was we didn't want faculty to interact with it – it was just students. And it was largely to eliminate any pressure that students might feel talking in front of faculty – that they would have to impress or whatever the case may be. It's just their friends. (CMT13:84)*

These seminars were initiated partly in response to feeling isolated. At a time "when there weren't really research groups … there was just the student talking to his or her supervisor", people would "get discouraged … they'd feel very isolated, and that's why we started our own workshop series."[1] In the English studies department there had been a similar experience. People spoke of a staff member who "when she was doing her doctorate, she organised a weekly research seminar for the doctoral students and the master's students" where they presented their work and "the discussions would go on after the seminars in the corridors."[2]

The difficulty with such initiatives is sustaining them. In the mathematics and applied mathematics department the seminars "kind of died out after the group of people that started it dispersed and it didn't really pick up again."[3] And in English studies the seminars "just fell away."[4] They depend on the energy and enthusiasm of individuals and do not persist because PhD people are transient. As one supervisor said, "his energy created a huge vibe amongst our post-graduate students and when he left, that gradually dissipated."[5] It is not always possible for academic staff to initiate these kinds of interactions. The English studies department has tried, "We wanted students themselves to commit to organizing, but it didn't happen."[6] The department of mathematics and applied

1 CMI11:223
2 KEI10:61 also KEI01:65,73
3 CMI03:84
4 KEI02:145
5 CMI23:37
6 KEI02:145

mathematics encouraged postgraduates to initiate peer interactions by offering to fund refreshments.[1]

Even those who have the initiative and sense of agency feel constrained. In the English studies department a PhD person wanted to initiate a graduate seminar, but didn't. "I'd often thought of proposing a weekly graduate seminar here, just for graduates, not the formality of the staff seminar. … But if you do that, you get made to feel like you're this weird nerd-like person with no life who's trying to cause trouble."[2]

Good research cultures are not confined to academic departments and full-time students. Some people find good research cultures outside of the academic context, in organisations where research is central to their work or where their knowledge is valued. Their work provides opportunities to engage around their research when they enjoy the support of colleagues who are researchers,[3] they are required to engage with international research and policy bodies[4] and their employment facilitates attendance at conferences.[5] And the cohort approach in public management provided part-time doctoral people with opportunities to discuss their research with their peers.

A range of structured and individual learning processes

Much of the learning at PhD level is self-driven or self-directed.[6] People read, write and work through problems in their own time and at their own pace. The people I interviewed take pleasure in directing their own learning and say that they do not want to be taught. Some said that they elected not to study at other universities because the PhD included coursework.[7] One said she was tired of being taught, "in South Africa, where you have an honours and you have a master's, you've engaged in as much coursework as you really want to do in your academic life."[8] And another said, "I like really to search for information on my own rather than being taught this: A, B, C, D. I have to read. The process of reading and understanding, not necessarily being taught, I think to me is very important."[9] They want to be able to construct their own knowledge and working through

1 CMO01
2 KEI03:94
3 WCI10:155
4 WPI07:77
5 WCI10:151; WPI07:73
6 WCI02:107; WCI02:115
7 WPI02:94; WPI08:37
8 WPI06:105
9 CMI01:51

material on your own allows you to "build the knowledge within yourself."[1] It is not appropriate to be taught at PhD level because "you're supposed to be quite independent in your thinking, in your research."[2] Or as this person says:

> *Coursework is something you take in. You go to class, a lecturer presents things, it directs you. But PhD is something that comes from you, see? So it stimulates your… it brings something out of you, and I think it's a challenge. Somebody who likes a challenge will enjoy research more than coursework. (WCI07:123)*

This is not to say that structured courses can't be useful at the PhD level. PhD people attend courses in order to fill gaps in their knowledge or to learn skills,[3] but they prefer that this be optional and self-initiated.

> *There have been certain things where I've actually made a point of going off and doing an equivalent of a course. … But I think the difference is, this is a much more self-directed thing … you have to decide for yourself how much or how little of that particular thing you need to engage with. (WCI02:131-139)*

Those in public and development management who were required to complete a course in social theory, spoke highly of the course,[4] but they were quick to explain that it was "not real coursework." The focus is on the process of developing the proposal, "I don't consider the social theory course to be a course. I consider it a method, a tool to get you to actually prepare."[5] They find it "really very helpful [to] see others presenting their research proposal or their conceptual framework"[6] and engaging with different lecturers, gives them alternative perspectives.

> *In all four lecturers we've had so far, all of them have talked about the proposal, but their explanation of what goes into it, how you do it, has not been… there has not been uniformity. Also when you speak to your supervisor and he's trying to direct you and then you come to class and you see a different perspective. So I think it's good to get that broad exposure. (WPI01:124)*

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1 CMI01:198
2 WPI10:107
3 CMI01:85; WPI01:108
4 WPI06:333; WPI07:111; WPI08:51; WPI10:117; WPI11:56; WPI12:471; WPI15:131
5 WPI07:119
6 WPI01:120

For some of the mathematicians, attending seminars was a way of covering a lot of ground efficiently[1] and of honing research skills.

> *You do need a broader range of knowledge and also a broader skills-set. … You need to know a lot of different techniques, and you can only find those out by the doing the work yourself. But if you do it in a workshop or programme, you get exposed to a whole lot of techniques that you probably wouldn't have thought of yourself and also, your own techniques get corrected. (CMI11:99)*

So while PhD people do not want to be taught, they do see the value of seminars and courses that are "not real coursework." It appears that the term coursework is associated with traditional modes of undergraduate teaching: "you've got to attend lectures, you've got to do a tutorial, like a traditional undergraduate lecture,"[2] and with "time-bound examinations"[3] which result in less effective learning.[4] Perhaps a lack of exposure to the modes of coursework employed in doctoral education in other parts of the world encourages this perception. One person who had participated in doctoral seminars in the USA spoke very highly of them.[5]

While the PhD is positioned as independent research, people do learn with and from others. They consult each other about their work, about administrative procedures, research methods and how to use tools.[6] Post-doctoral fellows are a good source of assistance, as are collaborators at other institutions.[7] While many said that their work was too specialised to discuss with their peers,[8] one gave this example of how those working in different areas can learn from each other.

> *I can give you an example. My room-mate is also doing the PhD in this department. He's doing it in fluid mechanics and I'm doing in finance. When we are at home, I actually take time to explain to him what I'm doing, what my problem is. And there was one time when I had some problem, I said, "I don't know why we have to apply this scenario here." Then he actually pointed out that, "Can't you see that these differentiable operators, they are unbounded. So if they are unbounded, if you are integrating them, this*

1 CMI03:44; CMI13:63; CMI19:267
2 WPI12:471
3 WPI10:129
4 CMI01:185; WPI10:129
5 CMI21:99
6 CMI07:132; KEI06:45; WCI02:187; WCI03:171; WCI06:131
7 CMI02:52; CMI05:31,35; CMI07:152; WCI04:123; WPI01:132
8 CMI02:62; CMI13:151; KEI04:83; KEI06:45; WCI06:131,143

> *thing will be bounded operators, so that's how you use this fact." And I said, "Okay, wonderful." But if I didn't discuss that thing with him, I could not have got that idea. (CMI16:92)*

One of the difficulties with doctoral studies is the lack of structure and open-endedness of the process, you are expected to "just wave around in the breeze."[1] Some people long for more structure, like the woman who wishes that her supervisor was "like a teacher going, 'Where's your homework book?'" and adds ruefully "unfortunately that's not what they do."[2] Providing structure has been the motive behind the experiments with "hybrid models" of doctoral education described in chapter two and for those in public management, the social theory course provides structure in the early stages.[3] Supervisors create structure by setting tasks and scheduling supervision meetings.[4] When meetings are scheduled "I knew I had to produce something."[5] And in the later stages the supervisor can help by setting deadlines, otherwise "you won't finish."[6]

Social interactions for leisure and support

In addition to seeking out collaborators with whom they can share their research and ideas, PhD people seek out social interactions for leisure, and emotional support and to help them make sense of their experience. For some, there are well established personal and family networks outside of the academic context. Some get support from siblings, children, partners or their extended family,[7] while others say that they socialize with friends.[8] Some find social contact through the church,[9] and others through their work – like the teacher who plays soccer with his school colleagues on a Friday.[10] Those who are themselves studying or who have completed PhDs are good sources of support. A civil engineer turns to her brother as "he's busy with his master's"[11] and an older woman with an established academic career says that "socially most of my buddies are actually beyond that, they've already got their PhDs, which is quite useful."[12]

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1 KEI04:66
2 WCI04:147 also WCI04:151
3 WPI03:111
4 CMI16:136; KEI07:118; WPI03:187; WCI07:271
5 KEI11:86 also WPI10:89
6 KEI09:99
7 CMI05:183; KEI07:24,128; KEI11:143; WCI02:223; WCI04:221; WPI10:173; WPI06:69
8 CMI02:142,136; CMI05:155,183; CMI13:139; CMI14:155; WCI02:187; WPI02:54
9 WCI06:263
10 KET07:122
11 WCI04:221
12 WCI02:187

People who are based on campus full-time and particularly those who have moved away from their usual social networks to the campus, are more likely to seek social contact within the academic department.[1] But even there networks may have been established during undergraduate study and someone who moved into the university at postgraduate level feels like "a bit of an outsider."[2] Some people find it "so difficult to interact with each other, that is a very difficult one,"[3] while others learn to seek out company.

> *When I came in, a lot of those students I've mentioned were still here, but they were almost at the completion stage of their thesis and after just a couple of months of my arrival, they finished and they left the institution. That's when I experienced the loneliness. … I went here alone and there was hardly anybody to talk to, there was hardly any other PhD student around me. I would spend the whole day in the office working alone. If I wanted to talk to somebody during the course of the day, I'd go out and look for somebody to talk to. … But I think, in a way, I acquired skills to do that. I easily interact with anybody I meet, I think I acquired those skills then. (WEI03:93)*

Sharing offices does encourage social interaction[4] and some people find it "nice because, if somebody makes a joke or, we have this tendency of talking to ourselves or swearing at the computer while we work, it just makes it good fun for the others."[5] But "you have to consider the other people – if you want to listen to your music, you either have to do it with earphones, or you have to ask all of them."[6] Some prefer their own offices.[7] For part-time PhD people who come to campus to work, it is more important that an office offer privacy and escape from other demands.[8]

> *In my sabbatical year I was actually working … in some little place that I don't think even the head of department knew where it was. It was through a door, through a door, through a door and then down the corner. And that was quite good, because then I really did find it was very easy to concentrate, and nobody distracted me. (WCI02:223)*

For those studying on campus, tutoring or lecturing work provides opportunities to meet other postgraduates and staff members. They say that "you start meeting other staff

1 CMI16:176; WPI06:125; WPI10:101
2 CMI05:39
3 CMI01:213
4 CMI01:217; CMI07:132; CMI08:115; CMI16:90; WCI07:299
5 CMI08:211
6 CMI08:211
7 CMI05:179
8 WCI04:275

members, you are teaching together … it has helped for me to interact with them."[1] And supervisors agree that "the fact that students tutor, makes them very much a part of what goes on, on the teaching side."[2] But not all academic units offer this kind of work.[3]

Some kinds of research make it easier to structure opportunities for social interaction than others. A supervisor in mathematics laments, "The students don't know each other at all. … You don't have the advantage, like you do in [the] zoology or botany department where people go on field trips and they all get to know each other."[4] But opportunities provided for social interaction are not always readily taken up. Some people don't want to socialize with others in the department as this person explains.

> *… a meeting at half past five will flow over and he'll say, "Come, let's go to dinner!" and everyone will go to dinner. In all honesty, I don't really enjoy that too much. I don't mind doing it sometimes. … it feels like I'm stuck at work when I want to be socializing. So I suppose what I'm trying to say in a very polite way, is that not everyone I work with is my friend, and when I socialize I like to socialize with my friends. (CMI05:155)*

In one of the academic units, "you hardly ever find a post-graduate student in the tea room even though they're invited to make use of it" which puzzles this supervisor because "when I was studying at Cambridge the tea room, the common room was a huge room where you always found post-graduate students and staff sort of mingling quite freely."[5] Some put this down to shyness or a lack of initiative,[6] but few PhD people feel comfortable going to the tea room. One says, "I've never found it a welcoming environment. Nobody's ever said, 'You're not welcome here.' or anything like that, it's just the vibe."[7] There is a sense that the space is dominated by established groups who talk to each other and newcomers find it hard to gain entry. Women students in particular feel that it is not a friendly place.[8]

Sometimes existing social networks fail because people cannot relate to the work being done and the experience of doing a PhD. One person finds that her work colleagues fail to

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1 CMI02: 144 also CMI08: 207, CMI14: 259
2 CMI10: 211 also CMI02: 140; CMI08: 102; CMI14: 128-132
3 WPI02:70-78
4 CMI22:239
5 I10: 211
6 I01: 221
7 I21:72
8 I21:70, also I19; I22

appreciate the kinds of epistemological challenges she is grappling with. "I would battle with my work colleagues, although we discuss what I learn here and what I've picked up, because like I said, there's a difference in fields. So I personally would like to rather interact more with other PhD students and social scientists."[1]

Family members are not always supportive as the PhD makes evident different interests and aspirations. A woman whose husband works in retail sales[2] struggles to get him to understand that she "can't just pack everything up and go out and about and go and jol[3] for the whole weekend."[4] And a man suggests that his wife finds it difficult to be supportive because his studies take him away from her, both in terms of time and in terms of his intellectual interests.

> *I gave my wife my topic yesterday to say, "This is my topic, [you] can read here." I know that she doesn't want to show how much of interest she has on what I'm doing, because it takes away time for her to be with me. And then somehow in her thinking, I suppose it's more like, "You're having power more than me, so I won't actually support you directly." (WPI03:123)*

Doing a PhD can alienate you from friends. Mathematicians find it difficult to communicate with friends about what they are doing. "You try to explain the thing in a layman's language so that they can understand, but you can't find somebody who knows what you are doing."[5] And other doctoral people find that their interests develop in directions that make familiar social pursuits less enjoyable.

> *It alienates you at some point. You want to have friends that think the same way that you do, that are worried about the debates that are going on … the current debates on political, social and economic issues, because you want to exercise your thinking, your framework of thinking about things and see if it works. … So it differentiates you because you can't engage … I have found it very difficult, at this point in time, to talk, just general conversation, because there's always this thing that comes in. You've got this other voice running in your head. (WPI03:263,267)*

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1 WPI07:235
2 WCI10:79
3 A South African informal term for 'have a good time' (South African Concise Oxford Dictionary, 2002)
4 WCI10:83
5 CMI02:68

Resources and funding

As far as resources go, doctoral people in these case studies are well provided for. They have shared office space, laboratories, computers, internet access, library access, access to journals in print and online and access to printing and photocopying facilities. But access to resources does depend on the discipline and the academic unit.[1] Someone in English studies complained that, "If you're going to do experimentation in the laboratory, you've got a laboratory to do it in. Whereas if you want an obscure text, you're going to have to go out and buy it yourself, it probably won't be in any libraries in the country."[2] Access to research resources is generally better for those who study part-time. A scientist working for the state was provided with equipment to carry out her research[3] and allowed to use work time for research.[4] Another state employee explains that his work gives him access to information that facilitates his research.[5]

Finding funds for fees, research and living costs is a problem and financial difficulties impact on the PhD experience.[6] It can take years to secure funding[7] which means that studies are undertaken when people are older and have significant family and job commitments. Once secured, funds are often inadequate and need to be supplemented by additional bursaries or part-time work.[8] There may be anxiety about whether and when funds will become available, "It becomes this expensive process, waiting for the funding to be released. Will you get funding? Won't you get funding?"[9] Financial worries make it difficult to concentrate and be productive.

> *Last year I was presenting to my supervisor the stuff I was doing on a weekly basis. This year it has been a bit erratic because we have some problems that we are trying to solve concerning my funding. So I wasn't working as hard as last year. (CMI02:52)*

Some people who study full-time have no funding and undertake regular contract work,[10] in one case by choice, "because of my cling to independence."[11] Even those who were relatively well-off with scholarships or funding from their families, felt the impact of not

1 KEI04:113; KEI10:93
2 KEI04:113
3 WCI10:255
4 WCI10:75
5 WPI11:97
6 CMI07:68; KEI06:93; WCI04:279
7 CMI01:7
8 CMI01:177; CMI02:106; KEI09:267; KEI11:135; WCI06:315
9 KEI06:93
10 WCI07:331; WPI06:273; WPI10:25,33
11 WPI06:271

earning for the duration of their studies: "I mean you're getting at an age where most of your mates are married and they're buying houses and stuff like that, and you still have to battle."[1]

A more significant impact of the search for funds is that people don't always get to research what they really want to, or to choose their supervisors.

> *Most of us, we depend on the funding available on the project, so you're taking the project that's available. Maybe it's not something you are very interested in or you are very familiar with or you are not comfortable with it, but because of the funds, you just put yourself on and you struggle though. (laughs) I think that's the worst part. (WCI07:127)*

Doctoral people are advised to choose their supervisors carefully (Leonard 2001:87-89; Mouton 2001:20), and supervisors believe that it's important to do research that really excites you, but the reality is that choice of supervisor and research topic is often dictated by the availability of funding.[2] This "may impede a bit on your creativity"[3] but the opportunity to get funding outweighs any lack of enthusiasm. One person says, "I'm being funded, so this is the best for me to do anyway, and I'll do the best I can."[4] People also get access to different levels of funding depending on their supervisor's research standing.[5]

Funding conditions can create time pressures. If you are funded through a bursary or scholarship, it is often for a fixed period. "You've got three years usually, the NRF only provides three years of money."[6] If you fund yourself through tutoring or consulting work, the additional work delays your progress.[7] And might be expected, those who study part-time struggle to find time for their studies.

> *This year I've been really pushing to actually spend more time at the university. Because if I set time aside at the office to do it, then people knock on the door and the phone rings. So I want to be able to leave and actually go and work somewhere else – and not at home because there are far too many distractions at home. (WCI04:275)*

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1 CMI08:23
2 WCI05:95; WCI09:259
3 WCI09:259
4 WCI09:263
5 CMI12:65; WCI09:183; WPI05:69
6 KEI03:130 also CMI02:112
7 CMI01:169; CMI02:110; CMI05:75; CMI07:80; CMI08:91; CMI11:31; CMI13:291; CMI14:275; WCI03:195; WPI10:25

For a lucky few, their research is integral to their work which makes them "lucky in the sense that, because it's part of my job, I can use normal time at work, and I do get twenty days study leave a year as well."[1] One might expect mid-career academics to be in this position because research is supposedly integral to their work. But many of them struggle to find time for their studies,[2] especially if their involvement in teaching has meant that they play a significant role in supporting students. "The biggest problem is that, if you are here, people just… You can't put a sign on the door saying 'the psychiatrist is out', particularly when you've got the reputation of being the 'big mamma.'"[3] A supervisor tells of a lecturer who failed to complete, "She was in Vista university and working on campuses where conditions were just appalling and the demands of that job were just so huge … The work she produced when she produced it was terrific, but she just never…"[4]

Sacrifice and lifestyle compromises

It has been said that "the road to the PhD is strewn with suffering" (Lee & Williams 1999:13) and I was struck by what people are prepared to sacrifice in order to complete PhD studies. They incur debt, put major life decisions on hold and disrupt their lives. Men from other parts of Africa who want to undertake doctoral studies, often leave their wives and children for three or four years to study in South Africa.[5] Being in a foreign country without one's family can be "very lonely"[6] and difficult for their wives.[7] But, as these men from central and East Africa explain, the painful part is not being able to see your children growing up.

> *The first-born is fifteen years old, the second is ten, and then the last two are twins. They are seven. … It's difficult, because my daughter, [when] she grew up, at this young age I was always with her, moving, taking walks with her. So she remembers a lot of those days. Now these boys who are seven, the four years is a very major time in their life. It may be a small time in my life, but it's big [in theirs]. (WCI06:271-275)*
>
> *I am married, I have family. So I had to leave my wife and my two children at home. They were very young. When I left our youngest – our son is the youngest of the two – was just about four months. So when I went back for the first time, that was [after] nine*

1 WCI10:75 also CMI04
2 CMI11:31; KEI04:56; KEI10:97; WCI02:223
3 WCI02:223
4 KEI10:97
5 CMI01:237; CMI07:192; WCI06:247; WEI04:109
6 WCI06:259
7 WCI06:255

> *months, he didn't know who I was. So that has been very, very difficult. It made me realize that there are other factors that actually can affect the PhD experience that are not really related to what you are working on. So by far that has been the biggest challenge. (CMI07:192)*

Others bring their families with them and regard this as an opportunity to "expose my family to another, different life."[1] But this is not always possible: "I would have loved the family to be here, but it is also a disturbance to them, because the children that I have, they have to go to school, so changing them from one system to another, it is not easy."[2] Some manage to visit their homes two or five times a year,[3] but financial constraints limit travel and make it difficult for their families to visit them.[4] Even those who study in their home towns and live with their families find that "your family suffers most, in my experience, and it's difficult to repair some of the damage of the relationships."[5]

People coming to study from outside the country have to pay higher international fees,[6] secure study permits and medical insurance,[7] find accommodation[8] and work out how to use public transport.[9] These tasks are more complex in South Africa because of the many languages spoken,[10] hostility from local people,[11] and high crime levels.[12] University structures put in place to assist foreigners are often unhelpful.

> *When I got here, there were very many things that I had to find out for myself. …Initially, unfortunately, I found it very disorganized, because I would go to one office and I would be referred to the next office and no-body knew what was supposed to be done. And I am a foreign student, I don't know what to do. … So that was not an interesting experience for me … it was not the kind of picture that I had in mind before coming. (CMI07:208-212)*

The concern for PhD people is to try and create some sort of balance between the demands of the degree and their lives. They speak of trying to be holistic about life.

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1 WEI02:64 also WPI10:165
2 CMI01:237
3 CMI07:196; WCI06:251
4 CMI01:173; CMI07:200
5 WPI15:191
6 WCI07:331
7 CMI01:7
8 CMI07:208; WPI10:205
9 WPI10:209
10 WPI10:205,209
11 WPI10:205
12 CMI02:152; WCI07:387; WPI10:215

> *…especially when you want your life to run holistically. I mean for me I want, as much as I'm doing a PhD, my son to be growing and not finding myself starting a family at about forty just because I did a PhD. So I have to battle and balance all these things. (WPI10:153)*

> *I can't make the studies the end-all. I try to enjoy my life as well. As I said I did get sick, last year. So really, I push it aside quite a bit, try to enjoy that life, if it might be the last days of my life, you know? We had a cancer scare. So that changed my mindset, you know? I had a paradigm shift and said "Hey, you know what? I need to enjoy life." (code omitted:132)*

"Birth, death and marriage are strictly for the vac"[1] is what one supervisor liked to tell his students. Unfortunately, the PhD has no scheduled vacations and life events show no respect for the opinions of supervisors. In the course of the PhD, people get married[2] and divorced.[3] They have babies[4] and have to manage the demands of families.[5] Ill health[6] and car accidents[7] all intervene inconveniently in the course of the PhD. And bills have to be paid. These intrusions from real life are challenging and people have to make uncomfortable and sometimes painful compromises. For many, there is a real sense that their lives are on hold while they complete the PhD.

> *… what happens is, once you've done your proposal and everything's in and the green light is there, … the albatross settles on your shoulder. And it sits there and says, "Right, now I'm here." And the weight is there all the time, it's always breathing down your neck, "Come on." No matter where I go, "Come on, you're supposed to be doing your PhD. You're supposed to be working on this. You're supposed to be doing this chapter. You're supposed to be reading that book." (KEI11:68)*

7.3 Identity and the PhD experience

Subjectivity and identity

I have described a range of what might be termed *structural conditions* of doctoral education that impact the PhD experience. But these alone cannot explain the range of experiences which people have. Experiences are fragmented and often dependent on the individual

1 KEI01:145
2 CMI19:131,143
3 WPI04:221; WPI15:171
4 CMI21:71; WPI12:43
5 KEI12:142; WCI02:191; WPI10:9
6 KEI05:118; KEI07:132; KEI11:60,86; WCI03:195; WPI04:221
7 WCI03:195; WCI07:463; WPI12:319

(Deem & Brehony 2000) so that it is possible for two people studying in the same academic unit, with the same supervisor to have very different experiences. To understand these differences, I turn to the question of *subjectivity*. The term subjectivity can be understood to mean "a person's perception of the self, as constituted by and mediated through language, culture and society" (Mikula 2008:195). The subject is produced by social and cultural discourses.

The doctoral person is subject to the academic and disciplinary discourses that they encounter in the environment of the doctoral programme. These discourses frame and constrain who they may be. So that doctoral education involves "producing subjects, … the discursive construction of subjectivity" (Green 2005:152). Doctoral people are constructed initially as PhD-student-subjects but are later allowed to become scholar- or researcher-subjects. Discourses allow for "multiple possibilities of subjectivity" of which a particular configuration is termed identity; who I am at present. Identity is thus a "temporary fixing" of subjectivity (Mikula 2008:195) and subjectivity the space of potential identities. This distinction is not always clear in the literature and subjectivity and identity are both used in explaining experiences of doctoral education.

There is a growing body of research into the PhD experience which focuses on identity and the process of developing new identities (Christiansen & Slammert 2005; Dison 2004; Green 2005; Johnson et al. 2000; Lee & Williams 1999; Lesko et al. 2006; Malfroy & Yates 2003). From the perspective of the academic discipline, the PhD is the final step in disciplinary socialization (Becher & Trowler 2001:47) resulting in disciplinary identities. This includes developing identities as researchers, scholars, academics, writers or philosophers (Barnacle 2005a; Christiansen & Slammert 2005; Kamler & Thompson 2006; Lee & Williams 1999; Malfroy & Yates 2003). In this process PhD people are presented with new subjectivities – potential ways of being that allow for these new identities.

The ways in which people describe themselves reflect their current identities. Younger full-time PhD people more often refer to themselves as students,[1] sometimes with qualifiers – foreign student, research student, PhD student.[2] Older people who go back to full time study after working, find that as PhD-student-subjects, their professional working identities are no longer available to them. They are at pains to point out, "I was actually already an

1 CMI02:88; CMI04:63; CMI05:35; CMI08:11,143; CMI14:119; WPI06:177,307; WPI10:25
2 CMI07:7; WCI07:127 and WPI10:25 respectively

academic in _____, I was a lecturer."[1] They seek for acceptable identities within the subjectivities constructed by full-time doctoral study. One woman explained, "I have stopped introducing myself as a student, I call myself a researcher."[2] Their responses reflect research which indicates that doctoral people who leave high-status jobs to study full-time find it difficult to adapt to the status of a research student (Deem & Brehony 2000:154; Leonard 2001:78).

People who work are in a better position because they have access to an alternate set of subjectivities constructed by the discourses of their work environments. They select identities from that space and describe themselves in terms of their work as "a PhD intern" or "full-time student and full-time staff."[3] Mid-career academics describe themselves as teachers or lecturers[4] or in terms of their positions as "research director" or "assistant dean"[5] or in terms of what they do, "I teach mathematics at university."[6] Those who work outside the university describe themselves in terms of their professions as "a water resources engineer," "psychologist" or "hydrolician"[7] or in terms of their work as "a scientist", "researcher", "research officer" or "manager."[8]

PhD people are excited by the new subjectivities that doctoral education makes available to them. They describe their own tentative steps towards exploring new identities within these subjectivities. They are becoming experts:

> *You tend to view the world with different eyes, you know. When you're small and you're at school your teacher knows absolutely everything and they are like wow! And now it's kind of reaching that level where I am the teacher, I'm making the contribution that those teachers are going to learn, and what they're going to impart on to other students. And it's… you kind of look at it slightly different. (WCI04:227)*[9]

They become writers: "I look at [my thesis] and I think, 'Wow, I wrote every word, every word of that book, I wrote it myself and I thought it up by myself.'"[10] One man says that he has to "develop my own identity as a scholar" and in the process "your worldview is

1 WCI09:75
2 WPO04:3
3 WPI02:38 and CMI04:63 respectively
4 WCI06:7; CMI01:27; CMI11:23; WPI01:6
5 WPT03:17; WCT02:223
6 CMT23:119
7 WCT05:7; WPT04:19 and WCT01:195 respectively
8 CMI02:22; WCI03:97; WPI07:65
9 Also WPI08:27
10 KEI11:108

pushed."[1] They become learned people that command respect and they welcome these changes saying, "you feel good when people identify you as one of the learned"[2] and that:

> *By the end of my PhD I should feel that I am really changed. Not that I think in the way I used to think, I write in the way I used to write. I wouldn't be that happy. I feel embarrassed to see some other people that, I think I have respect for them that, this is a doctor. But you read what has been written, you see what has been done as a doctor, you sometimes feel more embarrassed. So that I wouldn't want. I want to reflect what I deserve to be as a PhD graduate. (CMI01:253)*

With a PhD they expect to have greater influence, "if you're recognised as a qualified academician, then you are in a position to influence policies."[3]

Norton has written of the imagined future identities of people studying second languages and how their investment in these identities become their motivation for persisting (Norton 1995). In the same way, doctoral people are motivated by imagined future identities. They say "I intend to position myself as a development consultant"[4] and "maybe this [PhD] is going to give me the opportunity to become a lecturer, I want to see myself one day contributing knowledge to other people."[5] Research indicates that this kind of personal investment is characteristic of more successful PhD people (Wright & Cochrane 2000:191). But Norton found that when second language learners were placed in situations where the discourse positioned them as subjects that did not have access to their imagined identities, they were likely to end their studies prematurely (Norton 1995:31).

Likewise some PhD people find that the academic and disciplinary discourses produce them as scholar-subjects which have access to a range of identities about which they feel ambivalent. One person says, "I didn't want to become a pure academic, just writing"[6] and another refers to top academics in his field as dinosaurs and monsters.[7] More cynically, a recent graduate says, "I also learnt what it means to become a Doctor; at the end it means absolutely nothing, nobody cares."[8] One person feels that the discourse in English studies

1 WPI03:79
2 CMI01:197
3 WCI06:195
4 WPI08:27
5 WPI02:62
6 WPI12:9
7 CMI05:95
8 KEI11:125

constructs an elitist and competitive culture[1] which is at odds with their identity as an academic development practitioner.

Lee and Williams write that:

> *… becoming an independent scholar necessarily involves psychodynamic mechanisms of identification and investment in the subject position of the scholar … Inscription into that subject position demands submission to academic-disciplinary regimes and norms, a process of self-formation which produces identities and capacities specific to that regime. (Lee & Williams 1999:10)*

A range of research suggests that this process of identifying with and investing in "the subject position of the scholar" in the course of the PhD can present a crisis (Lesko et al. 2006; Metz 2001). One course elicited from participants "sensationalized stories" that were "filled with monsters, both terrifying and extraordinary" (Lesko et al. 2006:3-4) and another was described as cognitively difficult and emotionally threatening (Metz 2001:15). These traumatic experiences of doctoral studies appear to arise when there is a need to challenge fundamental assumptions about oneself, the world and the nature of knowledge (Lee & Williams 1999; Lesko et al. 2006).

This study did not elicit tales of trauma, possibly because the once-off interview did not allow such tales to surface. There were, however, hints at greater difficulties. For one man "it became clear to me that I had lost part of who I was along this journey" and that now "I am choosing to do a PhD and a PhD isn't actually doing me."[2] And we saw above how doctoral studies alienated some people from family and friends.

But there were suggestions that in the process of "submission to academic-disciplinary regimes and norms," people shed their sense of competence and many reported an initial loss of confidence.[3] One started out "meekly" being "quite nervous about voicing my own opinions, before they'd been edited by my supervisor, you know."[4] But over time they develop confidence again.[5] Confidence is built up when "people whose opinion I valued were listening to me as if I was talking sense."[6] The academic world with its exclusionary

1 KET11:13
2 CMI05:183
3 CMI21:127; KEI07:100; WCI06:219; WPI10:25; WPI11:74
4 KEI06:53 also WPI11:72
5 KEI07:102; CMI08:127; CMI11:39; CMI21:51,127, 139
6 CMI21:139

language and intimidating practices looks less fearsome from close up. One man who had been reluctant to present at a conference said, "But you know what? Having gone to one or two, and having looked at the topics I had an interest in, and having listened to the ideas from the presenters, I got the feeling that I could have done better."[1]

Research that focuses on professional doctorates shows that people coming to doctoral studies from positions of high professional status find it less traumatic (Malfroy & Yates 2003:127), possibly because the programmes focus on research that is "grounded and linked to practice" and make use of their many years of professional experience (Malfroy & Yates 2003:121-123). It would appear that these people are better able to stay outside of the academic and disciplinary discourses and retain their existing identities through the process. By contrast, tales of trauma emerge in programmes which focus on the production of academic and disciplinary subjectivities and identities (Green 2005; Lee & Williams 1999), and the case has been made that the intense emotions encountered in the PhD are "both a necessary condition and an effect of the production of the subject of doctoral study - the licensed independent scholar" (Lee & Williams 1999:6).

Generating knowledge

But alongside the difficulties, there is also a need to "write about desire and about pleasure which in some senses are equally 'backstaged' in formal accounts of graduate education" (Lee & Williams 1999:13-14). In this study, the pleasure of doctoral study became evident when people spoke about their research.[2] When asked to describe their projects, many of them became animated, leaning forward or gesticulating. They say things like "I like doing the research"[3]; "I find it like this enlightening journey, and I'm very excited about it"[4]; and "you start out just doing the calculation, then all of a sudden it goes really well, then you're all like 'yeah! yeah!'"[5] Doctoral people are excited by doing something new, saying "yes, this is actually what I did, and this is a completely new approach."[6]

The excitement about knowledge leads people to read widely and explore. They say things like, "Knowledge-wise, it's really interesting … you find there are little things that actually feed in to what your research is about, but along the way you learn all this other stuff. You

1 WPI11:72
2 CMI03:122; CMI14:251,263; KEI02:121; KEI05:48; KEI06:53,83; KEI12:44,58; WCI02:119; WEI02:20,62; WPI07:221; WPI06:131
3 WCI04:59
4 WPI07:287
5 CMI14:247
6 WCI03:53

read a whole lot and what you actually use is so little."[1] Doing the PhD enables you to, "do a lot of self-directed research, to follow leads – some of them as red herrings, others that you end up parking in the file of wonderful things to do once you've finished the PhD."[2]

It seems that excitement is necessary to sustain you over the length of the PhD. Here two supervisors explain why.

> *Do whatever excites you, because I guarantee you, no matter how much this excites you, by year two-and-a-half, it's going to frustrate the hell out of you, and if you're not in it for the right reasons, that frustration can really be soul-sucking. Whereas if you are in it for the right reasons – even if you've worked on this project for eight months, got scooped[3] on it twice and are still not quite sure whether it's going to get you a publication – you're excited about what you're studying, and so you'll come in to work because that's the excitement that drives you (CMI03:120)*

> *Someone once said to me, in the passages of this place, "You're so lucky … your author is so interesting." And he was a man who was doing a PhD and he was clearly reflecting on his own thesis. And that thesis - and it's many years ago - has never been completed yet, and I'm not surprised. You really do have to be extremely interested and believe in your thesis. I don't believe a thesis could be written out of cynicism. (KEI01:45)*

These supervisors are suggesting that it is unlikely that the PhD will be completed without some passion for the subject,[4] and for knowledge in general.

But no matter how exciting, the work is conceptually challenging[5] and this makes it difficult. "I thought it'll be easy, and I'll go home in the evening and I'll just read. And I get home from work and I'm absolutely exhausted and I've got to look at some academic novels. No! Please no!"[6] The kinds of conceptual challenges faced differ across disciplines. Those in public management say that the social theory course "was very heavy, in terms of introduction to research paradigms and the whole philosophy behind research"[7] and they

1 WCI04:219
2 WCI02:115
3 Getting "scooped" refers to having one's results discovered and published elsewhere first.
4 See also KEI13:53; WCI05:179
5 CMI16:126; WPI01:212; WPI08:53
6 WCI04:87
7 WPI08:53

struggled with understanding and articulating the conceptual frameworks for their research.[1]

The conceptual challenges are pronounced for those who cross disciplines or specialisms and need to come to grips with a significant body of knowledge, largely by themselves. A woman who recently moved into her field says, "there was a huge gap you know, I can still feel the gap but I'm slightly more comfortable in it."[2] Another who moved from biodiversity management into public management says that "when [the lecturer] was going on about positivism, I was thinking, 'Yeah? What's wrong with it?', because that's my training; as a scientist that's all you'd ever done."[3]

But the intellectual challenge is part of the pleasure: "I think mathematicians enjoy it when it becomes stressful – otherwise everyone could be doing it. The challenge, I think it's necessary. If I just get a solution to every problem easily then, it ceases to be mathematics."[4]

7.4 The PhD experience and the contexts of doctoral study

The PhD experience results from an interplay between the subjectivities constructed by the doctoral programme, the individual's past and emerging identities, and the structural elements of the intersecting contexts which they inhabit. But is it possible to make sense of how this interplay works for a particular PhD person? In this final section I reflect on the experience of some of the PhD people interviewed to illustrate how this process takes place.

The PhD person inhabits the intersection of a unique configuration of contexts with subjective views of the relative importance of these contexts. Each context may be more or less supportive of doctoral study. From the discussion above it appears that contexts which provide guidance, engagement around research, appropriate learning experiences, resources and social support are more supportive of doctoral study. I call such contexts *congruent* with the PhD. The second element of the PhD experience is the congruence between the PhD person and the contexts. A context can be considered to be congruent with the PhD person when it produces subjectivities that accommodate the existing or aspired-to identities of the PhD person. Here I use the stories of a selection of individuals to illustrate

1 WPI01:212
2 CMI14:43 also CMI07:47
3 WPT06:27
4 CMI02:130-132

how a range of contexts can be congruent with the PhD and the PhD people and I make use of nested context diagrams (described in chapter five) to give a visual map of how people are positioned.

Congruent contexts

Ronel is an established researcher who has worked for 20 years at a state research institute. Her dominant context is that of the workplace. She has little to do with the school in which she studies and contact with her supervisor is via e-mail "about once every two months, and I'll see him once or twice a year."[1] She has rather "more interaction with my co-supervisor that works here," meeting about once a week.[2]

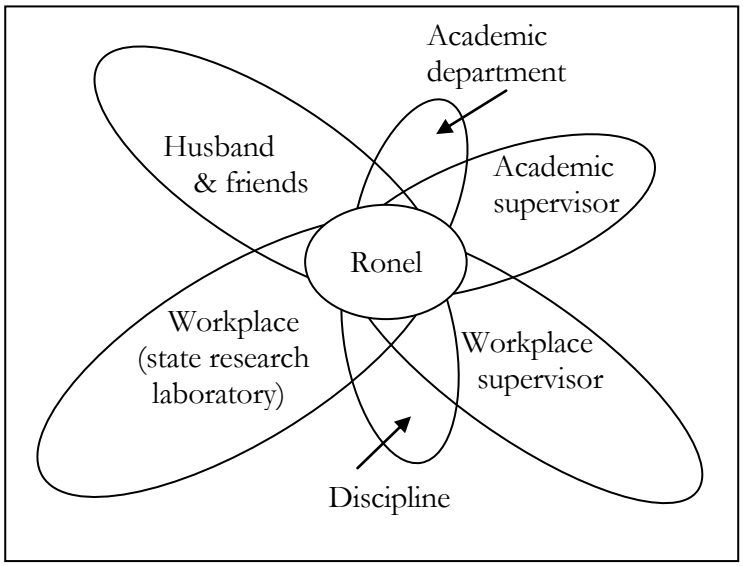

Figure 7.1: Ronel's intersecting contexts

For Ronel, the knowledge she pursues is guided by the requirements of her work.[3] She is experienced in setting up and running large research projects which gives her confidence.[4] She describes herself as "in a lucky position" because she has access to equipment, supplies, software, vehicles and people that she can "commandeer" for her research,[5] her employer covers her university fees,[6] and although she works full-time, she gets study leave and "because it's part of my job, I can use normal time at work" for research.[7] The work context also provides her with colleagues who she can engage with about her research.

In this case we see congruence between her dominant context, the research institute, and the PhD. We also see congruence between Ronel's sense of self and the subjectivities

1 Ronel:151
2 Ronel:155
3 Ronel:19
4 Ronel:231
5 Ronel:255
6 Ronel:263
7 Ronel:75

produced by her dominant context; she has worked here for 20 years. As a result, Ronel's PhD experience is relatively unproblematic. The difficulties which she does encounter relate to other contexts. Ronel has some anxiety about writing the thesis "because I'll be writing it for a different kind of audience than I would normally write for"[1] and she finds herself in conflict with her husband over the time that she spends on her PhD.[2]

Victor was a member of the academic staff at a university in East Africa before coming to South Africa to study full-time towards a PhD. He speaks highly of his supervisor[3] with whom he appears to work closely.[4] He shares an office with other members of his research group who are "the very first people I always try my ideas on."[5] The research group is "quite active" holding weekly meetings[6] and Victor is already an active part of the discipline, being a member of several professional bodies, presenting at conferences and publishing.[7] The academic department is a less significant context although he has taken on teaching duties to fund his studies.[8]

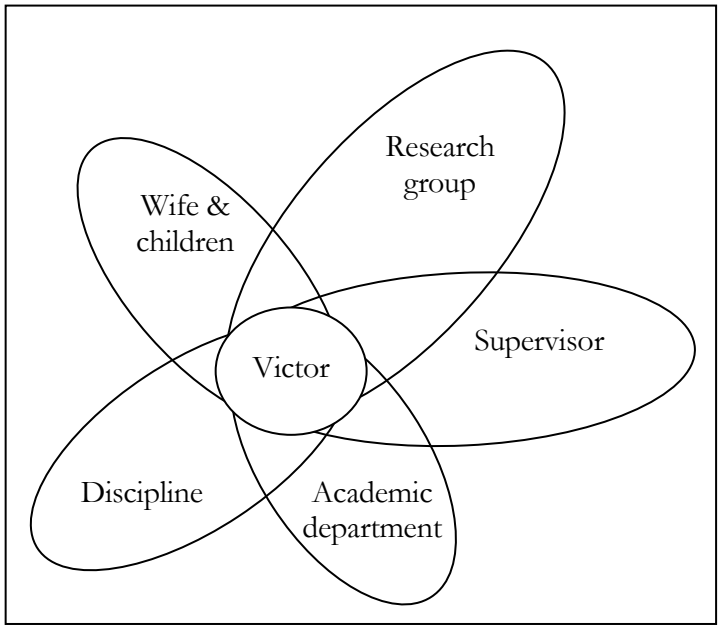

Figure 7.2: Victor's intersecting contexts

Again we see a high degree of congruence between the PhD and the contexts which dominate Victor's life – the research group, the supervisor and the discipline. And Victor's sense of himself matches the discourses of these contexts. He thinks of himself as a mathematician and speaks of taking a post-doctoral position before he goes "back home"

1 Ronel:231
2 Ronel:75
3 Victor:68
4 He speaks throughout of 'our' research and what 'we' have done. For example, Victor:88,92,96.
5 Victor:132
6 Victor:120
7 Victor:112,120,124
8 Victor:76

to "start an active group there."[1] The most problematic areas of his experience has been finding funding[2] and having to be away from his family.[3]

Derek is employed and completing his PhD in English studies part time. While he is very involved with his community and workplace,[4] for Derek the context of family dominates. He lives with his wife and three children. His mother lives with them and her four daughters visit regularly with their families.[5] Derek has regular contact with his supervisor and speaks highly of her; they have a "brilliant relationship"[6] and his studies are funded through her research.[7] But he has little contact with the academic department, taking part in seminars about once a year.[8]

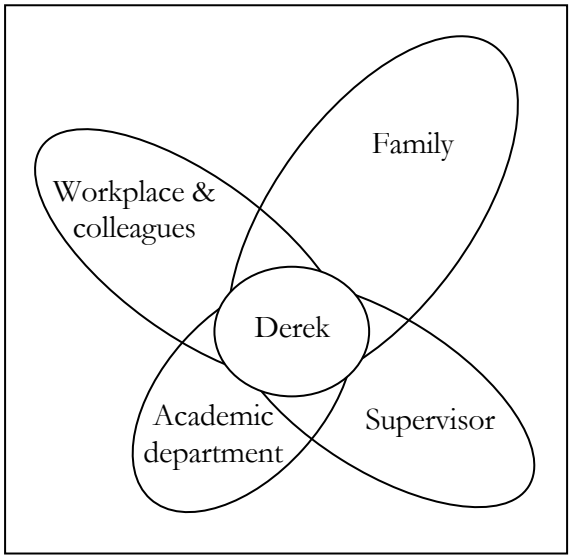

Figure 7.3: Derek's intersecting contexts

Despite his busy lifestyle, Derek's PhD experience is largely positive. Education is highly valued in his family - his interest in literature was sparked by his grandfather and is encouraged by his wife, who is also studying.[9] His family makes time for study, working together in the evenings, "you see them busy with homework and they see you busy."[10] He is inspired by his children and shares his work with them.[11] He is now into his fourth year[12] but is relaxed about the time constraints of part-time study. He says, "If I don't feel like doing it, I don't do it. And I wait until the mood gets me again, and then I sit and I work."[13]

1 Victor:23,47
2 Victor:68
3 Victor:192
4 Derek:122,146
5 Derek:24,128
6 Derek:114
7 Derek:66
8 Derek:104
9 Derek:20,24
10 Derek:24
11 Derek:24,158
12 Derek:32
13 Derek:160

Derek's positive experience appears to relate to the high degree of congruence between his family context and the PhD. In addition, this context does not require significant changes in identity; there is room for him to develop a scholarly identity because knowledge is valued in the family context. There is less congruence with Derek's other contexts. His employers do not value his PhD[1] and he does not feel at home in the academic context. When he has had to present his work at departmental seminars he says, "you're looking at all these academics ... and you come from my background, and you're scared to open your mouth."[2]

Lack of congruence

The stories told above show that a range of contexts, some in academia and some outside, can be highly congruent with the PhD. Where they are also congruent with the PhD person, these can result in positive PhD experiences. But what happens when the desired congruence is not there? Here we look at another three stories. In the first there is a lack of congruence between the dominant context and the PhD person, while in the following two there is a lack of congruence between the dominant context and the PhD person.

The structural elements of the PhD programmes, the range of contexts in which a doctoral person engages, and the identities of the doctoral person are not fixed. As an actor in the system, the PhD person is able to act to change them. Depending on their own sense of agency (in turn influenced by the discourses of the contexts and the subjectivities they produce), the PhD person may be able to (1) change a context to increase the degree of congruence; (2) change the configuration of contexts which they inhabit to expose themselves to more congruent contexts; or (3) adapt their own identities to be more appropriate to the context. Earlier in this chapter I described how PhD people acted to change the context by initiating graduate seminars. I also gave examples of people embracing new identities. In the stories that follow, we see examples of how people who feel unable to change the context and unwilling to change their identities, act to change the configuration of contexts.

Jean is a state employee, who works in an assessment and monitoring role. For her the dominant context is her workplace. She enjoys "being able to work in the field"[3] where her

1 Derek:58-60
2 Derek:100,104
3 Jean:251

research aligns with the work she does[1] and she enjoys affirmation from her colleagues.[2] But Jean does not have the support of her employer, who considers the PhD unnecessary, has withdrawn funding[3] and turned down her request for more flexible work arrangements to support her studies.[4] She struggles to make time for her research.[5]

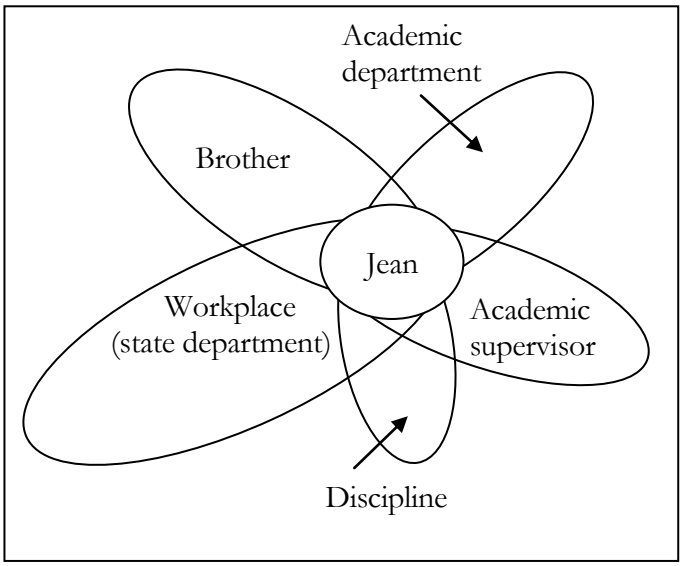

Figure 7.4: Jean's intersecting contexts

While Jean is at home in her dominant context, the workplace, we see a lack of congruence between this context and the PhD. Her employers have some interest in the results of her research, and she can engage to some extent with her colleagues around her research, but there is no support for her studies. Jean does not feel that she can influence her employers to change the context. Rather she seeks more contact with other contexts that are better aligned. She relies for support on her brother, a university lecturer who is also studying[6] and says, "this year I've been really pushing to spend more time at the university."[7]

1 Jean:67
2 Jean:239
3 Jean:279
4 Jean:91
5 Jean:91
6 Jean:203,211
7 Jean:275

A somewhat different story emerges in the case of James, a full-time PhD person in mathematics. He wants to be a mathematician; he has been strategic in selecting his supervisor[1] and he makes use of a range of people in the department to bounce ideas off of.[2] But he feels less part of the research group and suggests that it's not a "particularly warm environment."[3] He regrets having had to give up his own office for a shared office.[4]

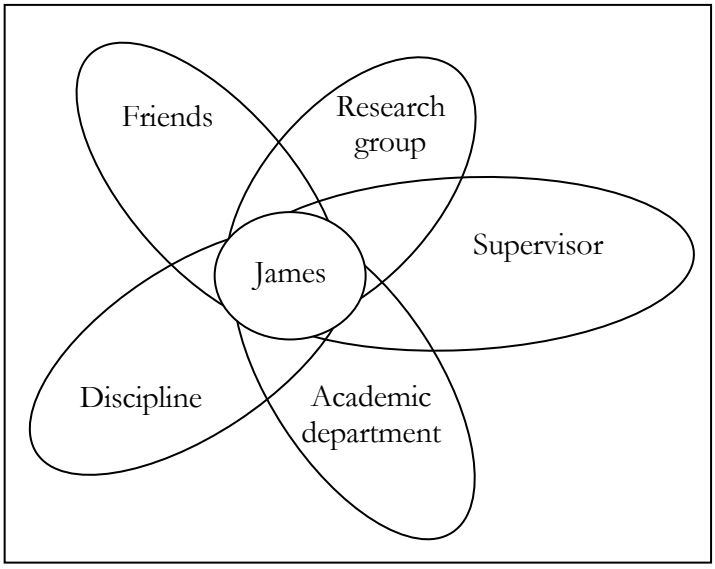

Figure 7.5: James' intersecting contexts

In this case the contexts of the discipline, department and supervisor are congruent with the PhD, but they are less congruent with James. He has been disillusioned by the academic world[5] and does not identify with the people he works with or with "that absent-minded professor type" describing them as "not the kind of people that I really enjoy spending time with."[6] James recognises the lack of congruence between these dominant contexts and himself. He is reluctant to adopt the identities which these contexts support. Like Jean he opts to change the configuration of contexts and chooses to spend more time with like-minded friends.

Martin is a mid-career academic who has taught English to second language speakers for many years.[7] Despite his own interest in Renaissance and postmodern literature,[8] he has

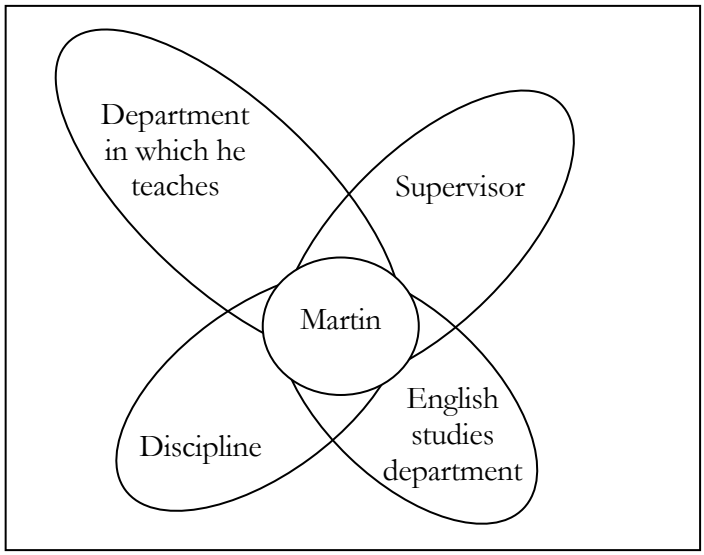

Figure 7.6: Martin's intersecting contexts

1 James:95
2 James:31
3 James:39
4 James:179
5 James:91
6 James:163
7 Martin:10-11
8 Martin:11

difficulties identifying with the academic pursuit of English. Not only does he feel that "literary criticism is such an elitist activity that it doesn't actually reach anybody," he also finds it difficult to relate to the culture of academic debate where "academics who are in competition with each other … try and shoot you down in flames."[1]

For Martin, there is tension around what he is expected to produce in the course of the PhD because of differences between the values of the discipline and his own values. He says of his research that "I want to make it relevant, you know – how does it apply to the continent of Africa?"[2] and "I want to prove it to myself as it were, that it can be made useful."[3] He takes a position in another department in order to distance himself from the discipline, but continues to have "an enormous amount of faith" in his supervisor.[4] He is confident that there is space within the academic environment for dissenting voices, but anticipates that he will "bump heads" in the process of completing his PhD.[5]

Increasing congruence

These stories highlight three points. Firstly, while the dominant contexts are likely to have the biggest influence on their experience, PhD people can benefit from a range of contexts, that provide different ways supporting their PhD studies. Having multiple contexts means that PhD people are less dependent on the way in which any particular context positions them. Secondly, the academic contexts of supervisor, research group, academic department and discipline have the potential to be highly congruent with the PhD, although they are not always. When these contexts produce subjectivities that align with the identity of the PhD person, the PhD experience is relatively unproblematic. Even if they do not, the experience may be positive if the PhD person is willing and able to change toward the disciplinary or academic identities which these contexts expect and support. The third point is that sometimes environments that are not academic such as research organizations or family may be more congruent and offer doctoral people a better PhD experience. The idea that other contexts can facilitate PhD study is supported by research that shows that part-time students are more likely to successfully submit their theses within four years (Wright & Cochrane 2000:190).

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1 Martin:13
2 Martin:16
3 Martin:20
4 Martin:37
5 Martin:37

Much of the work on improving the doctorate can be interpreted as investigating the degree of congruence between academic contexts and the PhD. For example, Denicolo examines how academic staff doing PhDs fail to get support from the departments in which they work (Denicolo 2004) and Lessing and Schulze examine the areas in which postgraduate researchers get support and fail to get support in the context of supervision (Lessing & Schulze 2002). Other research examines structural features of PhD programmes that improve the integration and socialization of doctoral people into academic contexts (Ali & Kohun 2006; Earl-Novell 2006; Lovitts 2001). Some have suggested changing the contexts of doctoral education by involving PhD people in large-scale collaborative research (Lunsford 2006:366); or using "peer learning" to construct an alternative to supervision (Boud & Lee 2005).

But strengthening the degree to which the academic contexts align with the PhD may not address the needs of all PhD people because of the need for congruence between the person and the context. The degree of congruence between the PhD person and the academic contexts has been investigated by, for example, McCormack who examines how three PhD people find their conceptions of research at odds with those of the departments in which they study (McCormack 2004), and Bartlett who considers alternative metaphors for supervision that seek to emphasis the pleasures of knowledge-making and which may be more relevant for some doctoral people (Bartlett & Mercer 2000). It would seem that people's prior identities and their prior beliefs about knowledge and knowledge generation are difficult to dislodge (Hewlett 2006:109).

Much of the research into the PhD experience continues to focus on the academic context. The work of researchers such as Green, Lee and Johnson (Green 2005; Johnson et al. 2000; Lee & Williams 1999) assumes the scholarly view of the PhD described in chapter four – that the PhD is necessarily concerned with developing autonomous scholars. This creates a discourse and subjectivities which support the problematic identity of the autonomous scholar, despite acknowledging that it is an identity with which many people are uncomfortable. "How research candidates are situated by prevailing discourses may not be consistent with the way they see themselves"(Barnacle 2005a:181). Those who are not willing or able to adopt the rational, masculine, independent identity inherent in the scholarly view, will not benefit from improvements in the structural conditions of the academic contexts.

7.5 Conclusions

The experience of people doing PhDs is important because it has bearing on whether they complete the process, how long it takes and whether others begin the process. It has become the subject of research, with stories of neglect and even trauma, and arguments that suffering is necessary for the work of doctoral learning, emerging alongside work that seeks for more positive experiences.

The experience of people doing PhDs in South Africa can be understood in terms of an interplay between the structural elements and subjectivities produced by their multiple intersecting contexts. In this chapter I identified five structural elements of doctoral education that can contribute to an improved experience. These are good supervision, opportunities to engage with people around one's research, a range of appropriate learning processes and activities, opportunities for social and emotional support, and resources and funding that do not necessitate uncomfortable lifestyle choices. Contexts which provide these elements, I call congruent with the PhD.

In addition, contexts each have discourses which produce particular subjectivities. For people entering doctoral studies with identities that are congruent with those of the contexts in which they study, the experience is less problematic. Even those who aspire to identities which are in line with the subjectivities of the context, are able to negotiate the PhD experience because they are motivated to change themselves; for example they become scholars. I gave examples of people in a range of contexts which provide this kind of congruence and noted that some of these contexts lie outside of the academy.

The experience is more problematic for PhD people whose existing identities are not aligned with the subjectivities produced by the contexts in which they study, and who are unable or unwilling to change themselves. They need to manage this lack of congruence if they are to complete their PhDs. In this study their response was to spend more time in other contexts.

In this chapter I have dealt with the PhD experience, focusing on the perspective of the PhD person. In chapter eight, the penultimate chapter, I turn to considering what is learned and what knowledge is generated during the course of the PhD and the extent to which this learning and knowledge meets the expectations of the PhD.

Chapter Eight

LEARNING AND KNOWLEDGE

What the PhD results in

8.1 Introduction

What I have learned **(January 2009)**

It is Sunday morning. I am sitting in bed with the Sunday newspapers around me, but I am reading Mouton and Muller's introduction to *Knowledge and Method … and the public good*. I am excited by their analysis of the "family squabbles in the social theory community" in South Africa (Mouton & Muller 1997:13). I smile at their turn of phrase; the elegant presentation of the argument; the nuanced conceptual picture which they paint. The pleasure that I take in these ideas feels familiar – it is the same pleasure which I once took in pure mathematics; in topological objects, elegant proofs and cunningly constructed counter-examples. I have learned to appreciate another art form.

Now nearing the end of my own doctoral journey, I begin to notice the results of the PhD. The physical thesis is beginning to take shape. I'm consolidating the chapters into a single document, writing the abstract and formatting the appendices. My days as a student are over and I have gone back to work. I begin to notice how I have changed, the new perspectives, understandings and knowledge which I have at my disposal. This seems an appropriate time to be reworking the introduction to this chapter which considers the outcomes of doctoral education. What do people learn in the process of the PhD? What knowledge is produced? What kind of person emerges?

I begin this chapter by examining in section 8.2 what is expected of the PhD. I consider first the explicit expectations expressed in policy and in registered qualification outcomes, and I construct an initial framework for what is expected of the PhD. Then I refer back to the three understandings of the nature and purpose of doctoral education which were identified in chapter four, to understand some of the more implicit expectations.

The PhD results in two tangible outcomes: a thesis and a Doctor. The thesis embodies the contribution to knowledge "out there"; the codified public knowledge of the discipline. While the Doctor embodies the contribution to knowledge "in here"; the private knowledge which includes new subjectivities and identities, skills and attitudes, and things known. While not wishing to discount the intimate relationship between the two, I address

these outcomes in different sections. In section 8.3 I focus on the doctoral graduate. I examine what people say they learn during the PhD and relate it to the doctoral programmes. In section 8.4 I examine the theses produced in the four case studies and explore the knowledge which results from doctoral research in the different disciplines. I examine the extent to which the knowledge produced meets expectations.

There is something of a paradox in doctoral education. On the one hand one is expected to produce knowledge within disciplinary constraints, which is acceptable to established scholars; while on the other one is expected to be innovative, to come up with something new. To what extent are PhD people constrained in what they research? And to what extent are they free to be creative? These questions are addressed in section 8.5.

8.2 The learning that is expected

While research into doctoral education has grown in the past decade, there has been relatively little written about what is learned, or the curriculum of doctoral studies (Gilbert 2004). Gilbert proposes that evaluation of the curriculum be at the extrinsic level, asking if the programmes meet stated needs; and at the intrinsic level, asking if the programmes meet the unstated and implicit needs. I address these two levels in the following two sections. I start by examining the expectations that are explicit in policy and procedures and then I go on to examine the expectations embedded in the discourses which surround doctoral education.

Extrinsic expectations

In Europe, while there are significant differences across countries, the typical doctoral degree is characterised by a combination of originality, disciplinary knowledge and carrying out independent research. It requires…

> *…successful preparation, and defence, of work meeting the following three main conditions: 1) It represents an original solution to the research problem; 2) There is a proven record of sufficient knowledge within a given scientific discipline; and 3) There is proven ability to conduct independent research within a given scientific discipline. (Sadlak 2004:8).*

More detailed descriptions of doctoral outcomes have been published by the Bologna initiative. The so-called Dublin Descriptors specify outcomes for all three cycles of

education. The requirements for the third cycle – doctoral studies – are listed in the table below.

Table 8.1: The Dublin Descriptors outcomes for doctoral education[1]

Graduates should…

- have a systematic understanding of a field of study and mastery of the skills and methods of research associated with that field;
- have the ability to conceive, design, implement and adapt a substantial process of research with scholarly integrity;
- have made a contribution through original research that extends the frontier of knowledge by developing a substantial body of work, some of which merits national or international refereed publication;
- be capable of critical analysis, evaluation and synthesis of new and complex ideas;
- be able to communicate with their peers, the larger scholarly community and with society in general about their areas of expertise;
- be expected to be able to promote, within academic and professional contexts, technological, social or cultural advancement in a knowledge based society

In South Africa, the new Higher Education Qualifications Framework (HEQF) specifies that "the candidate is required to demonstrate high-level research capability and make a significant and original academic contribution at the frontiers of a discipline or field." It goes on to indicate that the quality of the work must "satisfy peer review and merit publication" (DoE 2007:29), but it does not required that graduates be able to communicate their work or that they promote advancement in a knowledge based society, as the Dublin descriptors do. The HEQF is still to be implemented and the existing standards for doctoral degrees were developed before this framework existed. The earlier National Qualifications Framework (NQF) had no detailed guidelines on the outcomes of doctoral qualifications and the outcomes specified on the SAQA qualification database vary greatly.

For example, in addition to the critical cross-field outcomes, the general PhD at Wits (Qualification ID 9277) has the following three exit level outcomes: "the qualifying learner is capable of independent and original research"; "the qualifying learner possesses highly specialised, authoritative knowledge and is competent to apply that knowledge to the solution of problems"; and "the qualifying learner is self-directed and self-critical." While comparable outcomes in the general social science PhD registered at the University of

[1] (Bologna 2005:69-70)

Natal[1] (Qualification ID 2475) are to "question existing knowledge boundaries and practices and create responses to problems that expand or redefine existing knowledge outcomes"; "demonstrate intellectual independence; apply sophisticated knowledge and research methodologies for the solution of complex, unfamiliar problems" and to "autonomously synthesize and evaluate information and make sound evaluations on the basis of independently generated criteria."[2]

It is questionable to what degree the actual outcomes of doctoral degrees are related to the stated outcomes. While the general social science PhD registered at the University of Natal (Qualification ID 2475) expects graduates to "deal with complexity, lacunae and contradictions in the knowledge base," the general social science PhD at the University of Pretoria (Qualification ID 7385) rather curiously expects the graduate to demonstrate "academic leadership, and senior managerial occupation."[3] This begs the question whether those not in a senior managerial position are allowed to graduate. There are widely different levels of detail in the qualification outcomes. The D.Sc. degree at the University of Pretoria (Qualification ID 7665) has the following (single) exit level outcome: "the candidate will be a recognised international expert in his particular research field." By contrast the D.Sc. degree for UCT (Qualification ID 19751) has a comprehensive list of sixteen outcomes which include having "achieved a leadership role internationally in the chosen field of scientific research"; "understanding of the role of the sciences in society with regard to economic development and environmental sustainability" and "appreciation of the fundamentals of lifelong learning."[4]

Institutional documents from the case studies throw more light on the expectations. The curriculum for the PhD is "an approved programme of research" which makes "a distinct contribution to knowledge or understanding of the subject" and affords "evidence of originality either by the discovery of new facts and/or by the exercise of independent critical power."[5] The thesis has to show "knowledge and proficiency in the methods of research," "original research undertaken" and "a substantial contribution to the advancement of knowledge."[6] In English studies at Wits, the thesis must also "be satisfactory as regards literary style and presentation", show understanding of the "nature

1 Now part of the University of Kwa-Zulu Natal
2 SAQA web site, http://allqs.saqa.org.za, accessed July 2006
3 SAQA web site, http://allqs.saqa.org.za, accessed July 2006
4 SAQA web site, http://allqs.saqa.org.za, accessed July 2006
5 KED18:41
6 WCD03:par 3

and purpose of the investigations," an acquaintance with the literature, and an ability to assess the significance of the findings.[1]

The document provided by the Humanities faculty at UKZN to guide PhD examiners offers more detail, suggesting that the examiner report on whether the topic is persuasively motivated; the research field properly delimited and the research problem clearly formulated; the literature review is critical, discriminating and current; and the candidate's conceptual understanding is adequate. It also requires that the theoretical approach and research design be convincingly motivated; the research methodology be mastered; the study be focused and the work well-structured and clear. Claims should be persuasively argued and effectively supported with conclusions and interpretations that are relevant. As far as the thesis goes it must be properly organised with consistent and complete referencing and conform to "academic discourse".[2] This description suggests some of the explicit skills and knowledge domains which are to be mastered in the course of the PhD.

From these documents we can conclude that doctoral people must develop a deep understanding of the field of study, the major developments, concepts and debates within that field; they must also develop a detailed understanding of their specific speciality within the field. They may be required to learn about related knowledge areas, particularly where the research crosses disciplines. They learn to craft appropriate research questions and to construct ways to investigate their research questions and to document these in a research proposal. They are required to defend their choice of research questions and methods. They must be able to carry out the research and report their findings in a manner which is acceptable to the discipline and to the wider academic community. In the process of writing the thesis, they learn to write in a scholarly manner, following the style of the discipline. They learn to critique the work of other researchers and to positions themselves intellectually within the community of scholars. These elements are summarized in the following table.

1 KED03:1
2 KED03:3

Attitudes Doctoral graduates have...	**Skills** Doctoral graduates can…	**Knowledge** Doctoral graduates know…
• An appreciation of academic modes of knowledge • Respect for evidence-based research • Disciplinary understandings of quality research	• Locate and select information about their knowledge area • Engage with and critique the work of others • Plan and conduct a research project • Formulate coherent, substantial claims supported by data and arguments • Write a thesis • Express themselves in the appropriate academic discourse	• The major developments, concepts and debates in their field • Detailed knowledge of their speciality • Broad knowledge of adjacent subject areas • What constitutes a well-formed research question in their field • What research methods are appropriate • What counts as knowledge in their field

Table 8.2: The explicit expectations of the PhD

Intrinsic expectations

The three views of the PhD which were explored in chapter four each contain expectations of the outcomes of the PhD, although these are sometimes less explicit. The *scholarly* understanding of the PhD regards the primary objective to be the production of scholarly knowledge with the scholar being a byproduct of this knowledge generation. The *labour market* understanding of the PhD focuses on developing high-level skills in knowledge generation which are needed by the knowledge economy. And the *ongoing development* understanding of the PhD emphasizes the engagement with knowledge in the process of developing critical intellectuals. Each of these views is underpinned by discourses which shape the expectations and the subjectivities of supervisors and supervisees. The subjectivities of these people in turn demarcate realms of possibility in their learning and knowledge production.

Scholarly view

The scholarly view of the PhD has less to say about what ought to be learned during the PhD as it assumes that the person undertaking doctoral studies is already competent in the practice of research. Rather the PhD is an opportunity to practice doing research on a larger, more challenging project and in the process to hone one's research skills. There are, however, clear indications as to what the credentialed scholar should be able to do. A scholar has explicit subject knowledge; is able to analyse and synthesize the research in a

field (Boote & Beile 2005:4); and is able to apply research techniques and specific tools (Becher 1989:23).

Most importantly the scholar has sufficient understanding of knowledge in the discipline to be able to judge "what counts as a relevant contribution, what counts as answering a question, what counts as having a good argument for that answer or a good criticism of it" (Becher 1989:26). The specific requirements depend on the nature of knowledge and knowledge generation in the discipline. While researchers in education need to be familiar with "diverse epistemological perspectives; diverse methodological strategies; the varied contexts of educational practice; the principles of scientific inquiry; and an interdisciplinary research orientation" (Eisenhart & De Haan 2005:7), diverse epistemological perspectives and an interdisciplinary research orientation may not be expected of an engineer (Becher 1989:29).

Less explicit is the requirement that doctoral graduates be acculturated into the academic and disciplinary cultures (Christiansen & Slammert 2005:1050-1051; Dison 2004:8). This socialization includes "the development of a positive orientation towards discipline-based and institutional norms, including broad social prescriptions and specific behavioural guidelines prevalent in the group" (Kuh & Whitt 1998:38). Doctoral graduates should be familiar with the values, ideologies, artefacts, idols and language of the discipline (Becher 1989:23) as well as the social intricacies and conventions of participating in the communication networks of the discipline (Becher 1989:81-84).

The scholarly view is underpinned by modernist and scientific discourses which support the production of academic knowledge. "[T]he products of the academy have necessarily a status of knowledge" (Cross 1997:84) while other forms of knowledge are devalued, and not acceptable products of the PhD. More insidious is the strong continuing association of the scholar with the independent man of reason (Johnson et al. 2000) that presents the doctoral person with a range of possible subjectivities which women, and those inclined to value emotion and dependence, may find difficult to adopt.

The labour market view

The labour market view focuses on developing skills appropriate for employment which might range from academic careers, through research in other contexts to work in business, industry or the public sector. As discussed in chapter two, academic and research work is changing and necessitates more formal training and skills in teaching, working in teams,

sourcing of funds, project management, the legal and ethical complexities of generating knowledge in collaborative settings and consulting. So this view of the PhD results in lists of skills to be developed during the PhD, although most are recommendations rather than established practice.

For those who regard the PhD as preparation for a career in research, doctoral education should produce "scientifically based researchers" who are "professionals who engage in inquiry to identify or develop defensible explanations or interpretations" (Eisenhart & De Haan 2005:3). Such researchers would be expected to have research skills – to be able to pose significant questions that can be investigated empirically; to link research to relevant theory; to use methods that permit direct investigation of the question; to articulate an explicit and coherent chain of reasoning; to replicate and generalize across studies; and to make research public to encourage professional scrutiny and critique (Eisenhart & De Haan 2005:3). Some have argued that participating in national research programmes would allow scope for learning how to structure, fund and manage large projects (Christiansen & Slammert 2005; Marais & Garbers 1996:363). An increase in knowledge production across disciplinary boundaries has led some authors to argue for interdisciplinary and transdisciplinary programmes (Eisenhart & De Haan 2005; Ntshoe 2003). The greater need for transdisciplinarity requires fungibility[1] of researchers (Gibbons et al. 1994:150) and this requires generic or transferable knowledge skills (Blume 1995).

The growing number of doctoral graduates who find work outside of the academy, has led to calls for better preparation for the working environment. Doctoral people are expected to learn "project management, entrepreneurship, leadership and communication, technological and commercial development and understanding public policy" (Manathunga & Wissler 2003:233), and there have been calls to "[e]xpose students to various career paths by encouraging internships, inviting alumni to speak to students, and encouraging students who seek positions outside academia" (Golde & Dore 2001:46).

The skills development approach to doctoral education results in an "inexorably additive" (Bass 2006:116) approach to doctoral education with ever more desired learning being included in the process. While many of these suggestions are admirable, at some point it becomes untenable to cover every possible skill which might be needed in every possible

[1] A legal term applied to goods that can be substituted for other goods

career. And in South Africa the individual nature of the research degree and supervision practice makes it unlikely that PhD people will develop uniform skills.

The more implicit requirements of the labour market view are also problematic. It is underpinned by discourses of the market and the knowledge economy and assumes that the PhD prepares one for a career. These discourses are on the one hand empowering in that they position PhD people as valuable national resources (Kehm 2007:315-316), but on the other hand disempowering in that the highly trained minds are interchangeable. Learning is depersonalized, with the identified collections of skills to be learned taking no account of the PhD person or their existing knowledge and subjectivities. These discourses lead to a view of knowledge as a disembodied product rather than as a personal process (Cross 1997:101). And as I discussed in chapter four, the labour market perspective encourages the assumption, inappropriate in the South African context, that doctoral people are young and starting out on their careers.

Ongoing development

The ongoing development view of the PhD is less prescriptive about what needs to be learned. This view recognizes that people come to the PhD with different knowledge, skills and aspirations, and it takes into account that people may need development in different areas. The focus is on a process of personal and professional development, engagement with knowledge and transformation into a critical intellectual. The specific learning is negotiated between the supervisor and the supervisee.

Doctoral people seek personal enrichment and cognitive development (Lessing & Schulze 2002:146) and expect that doing the PhD will change them, "by the end of my PhD I should feel that I am really changed - not that I think in the way I used to think, I write in the way I used to write."[1] Where necessary, for people from non-academic backgrounds to succeed in the academic environment they need to learn metacognitive skills[2] and an understanding of academic ways of thinking. The ongoing development view of the PhD expects an engagement with knowledge which necessitates learning the full range of skills and knowledge required to undertake academic research. And because this perspective does not expect the doctoral candidate to already be a skilled researcher, there is scope for more explicit training in these skills where necessary.

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1 CMI01:253 also WCI04:227

2 WPI04:9

The PhD as ongoing development is concerned with knowledge and the generation of new knowledge. Because it acknowledges a wider range of career intentions, it has the potential to embrace broader interpretations of the kind of knowledge that can be pursued in the PhD, allowing for knowledge that is driven by personal and social concerns, as well as by disciplinary or market imperatives. The discourses of equity and social responsibility which underpin this view of the PhD allow a greater range of people to be positioned as potential Doctors. It is inclusive and personal allowing for learning and knowledge that is negotiated by each doctoral person.

The three different views of the PhD lead to different understandings about what is to be learned during the PhD, what skills are to be acquired and what attitudes should be cultivated. The explicit expectations of the PhD summarized in table 8.2 focus on research skills. These skills are included in the expectations of all three of the PhD perspectives, but with different emphases. In the labour market view research skills are a subset of a larger set of skills to be learned. In the scholarly view, they are assumed to be in place with the PhD offering an opportunity to practice and demonstrate these skills. And in the ongoing development view these skills need to be acquired, if they are not already in place, as part of a personalised programme of study.

8.3 What doctoral people say they learn

Doctoral people are emphatic about how much they learn. They say, "I learn a lot. I learn a lot"[1] and "Gosh, it's difficult to think whether I knew anything before!"[2] Graduates and those still engaged with their studies say that they learn about the field which they study and about peripheral knowledge areas. They also learn about the academic environment and different aspects of academic practice. They develop a range of practical skills and they learn about themselves. In this section we draw on the interviews with PhD people to unpack what they report learning.

About the area of research

Most obviously, doctoral people learn about the field in which their research is located. They say that they are learning "the hydraulic field"[3] or "all this physics"[4] or "a lot of maths."[5] The PhD is an opportunity to read widely[1] and in much greater depth.[2] As a result

1 WCI03:187
2 WCI02:175
3 WCI03:187
4 CMI07:47
5 CMI09:60 also CMI03:44; CMI07:164; CMI15:51; CMI21:91

PhD people develop broader and deeper understandings. They say, "I'm widening my conceptual view of the things that I already understood"[3]; "I think my understanding of architecture is vastly enriched"[4]; or that they have developed "much deeper insight into literature, the writers, writing."[5]

But doctoral people also learn about adjacent knowledge areas. One says that "I'm touching on the chemistry, the physics, the hydrology, the biology – all of that kind of stuff, as well as policy and management and public participation."[6] And another that "I am doing a PhD in mathematics, and it's financial maths, so you will find that I will need ideas from economics, I will need ideas from finance, I will have to look at what is being used in the banking sector."[7] When their research does take them into adjacent knowledge areas they have to learn how to engage appropriately with the people in those disciplines and they find themselves "growing into a different way of approaching knowledge."[8] Depth and breadth of learning are reported by people across all four of the case studies.

Academic professional skills

Some of what is learned can be described as academic professional skills. PhD people learn the academic culture[9]; they learn the political undercurrents[10] and to "play the game" of academic research.[11] They learn that decisions about what knowledge is valued are not objective, but rather that power dictates what theories get considered.[12] In the process, "illusions about great teachers" get destroyed.[13] They learn how to market themselves by careful choice of topics, collaborators and journals.[14] They also learn how to use their research to sustain a career and they develop a sense of their role in relation to the broader academic research project as this young lecturer explains:

> *You've got to be aware that this is not just a piece that you're going to lovingly put on your shelf and stare at and think you're fantastic and pat yourself on the back. This is a*

1 KEI03:82
2 CMI01:27; WPI05:31
3 CMI01:141
4 WCI02:175
5 KEI11:102
6 WCI04:223
7 CMI02:122
8 KEI09:175-179
9 WPI05:27
10 KEI03:48
11 CMI05:95
12 CMI05:91
13 KEI03:60
14 CMI05:95; KEI03:86

> *piece that you need to use to … sustain yourself, to present at seminars and colloquiums. …I think you've got to be aware that it's not just about you; that you're functioning within a department, and that the department has a purpose as well within the university, and that the university is known for putting out a lot of work. So it's not just about you getting that degree, it's about you serving the purposes of the university as well. (KEI06:106)*

PhD people learn how to participate in the academic discourse appropriately, using academic language and the social conventions for participating.[1] But the PhD is also the time to learn about "the robustness of academic debate."[2] And in order to participate in robust intellectual debate "you have to learn that it's not you as a person on the line, it's the ideas."[3] They learn humility and to accept and use criticism.

> *Humility. There is nothing more crushing - at least for me - than bringing a piece of work that you've worked on for hours and hours and having your supervisor very kindly put lines through it. So I think that's very important, that you just sort of take yourself off that pedestal you've put yourself on, and learn the value of constructive criticism … So I think you've just got to learn to accept that firstly, these people know more than you do, and secondly that sometimes you're going to put out a really average or below average piece of work and you've just got to use it as a learning curve. (KEI06:104)*

While PhD people learn skills, like the use of software, that will help them in their teaching,[4] they do not directly learn about teaching. Some supervisors expect postgraduates to "participate in the teaching aspects of the department"[5] but learning to teach is not generally part of the PhD. Some people said that they would have liked to learn more about teaching.[6]

You learn how to supervise. Those doing PhDs are sometimes already supervising at master's level or planning academic careers, and they reflect on supervision in the course of their PhD experience. A lecturer from the University of Zambia wants to change supervision policies there on his return,[7] and someone from the University of Malawi says "at the same time, as a lecturer it's something that I'm trying to learn: 'How can I become a

1 KEI10:77
2 KEI08:85
3 KEI10:72
4 CMI01:93, also KEI11:161
5 CMI123:31 also KEI08:77
6 KEI06:26; WPI02:70
7 WCI06:187,195

good supervisor?""[1] A recent graduate who spent time in the US and found the seminars there particularly affirming and rewarding,[2] says that "I have this plan, this vision of me as the supervisor and my students; how we will meet every week, once every two weeks perhaps, and read, and have a couple of papers and things like that."[3]

Those who report learning academic professional skills, were primarily based in English studies and mathematics and applied mathematics, the two case studies where people are more often pursuing academic careers. Fewer people in the other two case studies refer to learning academic professional skills and those that do are already engaged with academic work.

Research skills

In contradiction to the scholarly view of the PhD which holds that people already know how to do research, PhD people say that much of their learning revolves around doing research. They learn "to become researchers."[4] This involves learning to engage with and critique the literature[5] and learning "how to read the research community and know which are the forefronts of the research."[6] A large part of the process is learning to identify a good question, developing "your own sense of quality, so that you can evaluate your own ideas"[7] and this might involve learning to "narrow down" the scope of your research.[8] They also report learning to develop a conceptual framework[9] and make use of specific research methods and methodologies.[10]

PhD people learn to use specific research tools[11] like technical software[12] and telescopes[13] and develop skills like writing computer programmes[14] or more general "analytic computer skills."[15] And they learn to write research papers,[16] which includes learning to identify

1 WE102:22 also CMI03:16; WCI01:27; WPI15:83
2 CMI21:139
3 CMI21:99
4 KEI05:64
5 CMI01:141; WPI01:120; WPI04:105
6 CMI05:71
7 CMI11:115 also WPI09:73
8 KEI05:64
9 WPI01:120; WPI09:75
10 CMI05:71; WPI04:275
11 CMI05:147
12 CMI01:81; CMI11:107; CMI13:267
13 CMI11:107
14 CMI11:115; CMI20:199; CMI22:35,71
15 CMI15:47
16 CMI07:172; CMI11:187; CMI22:123

topics or sections of work that are suitable for academic papers[1] and learning to write in a discipline-specific way.[2] And those who attend and present at conferences learn how to present your work[3] and "how to put across information."[4] Some of what is learned is specific to the PhD. People say that they learn what a good thesis looks like,[5] "how PhD's are supposed to be written"[6] and "to speak thesis English."[7] This knowledge enables them to complete their own theses, but also prepares them for the task of supervising others in the future.[8]

People across all four of the case studies report learning the academic research skills which are explicitly expected. However, they do not learn the larger set of research skills envisaged by the labour market views of the PhD. Doctoral research is generally not collaborative, although as I discuss in the next section, there was evidence of people in research teams in civil and environmental engineering working on closely related research projects. And in the research groups in mathematics and applied mathematics, there was evidence that people discussed their work with others in the group. For these people there is some opportunity to work collaboratively.

More generic knowledge skills

But there are also a wide range of more generic skills that are learned, which may have relevance for a range of contexts, including research. Across all the case studies, PhD people agree that they learn to write, to express ideas in writing[9] and for some this includes learning the basics like grammar[10] and how to use word processing software.[11] They also learn presentation skills[12] and different ways of communicating[13] that enable one to "become a brilliant mediator, facilitator."[14] And as part of learning to communicate they learn "how other people read and what kinds of things they pick up on."[15]

1 KEI06:108,110
2 CMI17:256; CMI22:43; WCI10:231; WPI07:53
3 KEI03:88
4 KEI05:64
5 KEI10:11
6 KEI11:125
7 KEI01:15
8 WCI02:139; WCI06:183
9 CMI03:96; CMI04:183; CMI07:172; CMI09:112; CMI22:163; KEI05:64; KEI11:34; KEI12:184; WCI05:107; WPI09:69
10 KEI11:34
11 CMI12:101
12 CMI03:96; CMI07:172; CMI21:151
13 CMI21:218
14 KEI11:102
15 KEI09:227

People say that they develop "the ability to acquire knowledge on your own"[1] and that "you sort of learn how to learn on your own."[2] They learn "to read much deeply everything, not just scan"[3] and how to process information.[4] Some of this is learning "to access and find information,"[5] to use the internet[6] and the library,[7] but it goes further. They also learn to reason[8] and "how to think logically, very logically."[9] At the end of the process they "can argue a point"[10] and "present an argument in a skilled manner."[11]

PhD people describe the analytical skills which they develop. They say, "I learn to understand, to see a big picture, and after that, to try and see, actually all these pieces in the big picture"[12] and they say that they emerge "being able to analyse the issue, disaggregate the issue."[13] They learn "to see their work in context, not just 'Here's the number, the answer. What does it actually mean?'"[14] and "how to fit the data into model and use optimisations and apply your mathematics to real-world situations."[15] They become skilled at "thinking through quite a complicated problem"[16] and learn "the process of actually tackling a problem which hasn't been solved before."[17] They learn to engage with other people's ideas[18] and "take data that's [a] continuous stream and turn it into something that's hopefully... a predictor of the future."[19] More generally, people say that they learn "critical thinking."[20]

Again these generic skills were reported across all four case studies. These skills are in line with those proposed by the labour market view. They are transferable and are probably why the PhD is valued in many contexts. There is, however, the possibility that the PhD

1 WCI05:191
2 CMI15:131
3 WCI03:187
4 CMI15:51
5 KEI05:64, also KEI08:165
6 WPI06:285
7 WPI04:241
8 KEI12:188
9 KEI11:100
10 KEI11:102
11 KEI12:184
12 WCI03:187 also KEI09:59
13 WPI09:191
14 CMI22:71
15 CMI22:87
16 CMI15:51 also WPI09:69
17 CMI09:60
18 KEI11:127
19 CMI15:51
20 KEI09:59 also WPI0967-96

produces people with an approach to knowledge which does not fit very well into the working world, as this supervisor explains:

> *I just had a student of mine, who's just about to finish her PhD, and she's just gone into industry and one of the problems we talked about, is that because of her research attitude, she would want to get to the bottom of problems, and make sure that she understood exactly what was happening. That doesn't go in engineering. You've got a deadline, you've got to get this out by the end of the week and get something that works. You don't need to understand it, you don't need to make it perfect, it's just got to work. And that is not very satisfying for an academic sort of mind (WCI05:75)*

Self-knowledge and interpersonal skills

Completing a PhD is a process of self-discovery, "you learn a lot about yourself, what your limits are, the limit of the sponge that is in your head."[1] One woman learned, "that I am a bulldog, if I've sunk my teeth into something, I will stick with it and I will follow it through."[2] In the process people develop self-confidence[3] and skills in self-management. They discipline themselves[4] and develop perseverance,[5] keeping focussed on the task and motivating oneself.[6] They learn to manage time,[7] sometimes by delegating other tasks,[8] or delegating parts of their research.[9] They learn meta-cognitive skills which enable them to take control of the process[10] and become independent.[11] And they learn how to create and maintain balance between the research and their lives[12] and "to survive" financially.[13]

During doctoral studies one learns interpersonal skills. The process of conducting research and negotiating the work of doctoral learning forces one to interact and engage with people.[14] One person says that working alone forced him to "go out and look for somebody to talk to" and now he finds that he can "easily interact with anybody I meet."[15]

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1 WCI04:219
2 KEI11:125
3 CMI21:127
4 CMI09:60; WCI03:187
5 WPI04:277
6 KEI06:104; WCI04:219
7 KEI03:88; WPI07:217
8 WPI07:147
9 WCI10:255
10 WPI04:221
11 CMI02:88; CMI11:147
12 CMI05:127
13 CMI07:72; WPI06:273
14 KEI03:88; KEI11:127; WCI03:187
15 WEI03:93

You learn to network,[1] to negotiate colleagues[2] and an unhelpful bureaucracy by being persistent, and making sure you get answers.[3] You also learn how to interact with your supervisor, "what distance to keep between you and the supervisor."[4] Some learn the sophisticated social skills reflected in the story at the end of chapter six. They learn to read their supervisors and use humour to deflect criticism.

For people studying in a foreign country there are things to learn about life in a new country. One says that now, "when I speak to someone, I'm more able to judge whether a person is friendly or not friendly"[5] and she has learned "which places to visit, which places to avoid."[6]

So the explicit expectations of what is to be learned in the PhD are met. People learn to do and to value academic research and this learning is observed across all the cases. But the less explicit elements of the PhD differ according to the discipline, the interests and orientation of the PhD person, the ways in which the PhD programme is structured, the extent to which they work alone or with others and whether they relocate to study. That the learning outcomes are so varied supports continued debates about the nature and goals of the PhD. All three views of the PhD are supported by the common outcomes and the other learning can be interpreted in different ways.

8.4 The knowledge that is generated during the PhD

In this section I examine the theses recently produced in the four academic units. I focus on the topics, their contribution to knowledge and the structure and style of the theses and draw on the interview responses in which people described their research projects. I am interested in understanding what kinds of knowledge are being produced. How does it differ across disciplines? In what ways is it innovative? Who is driving the research agendas?

The knowledge produced by mathematicians and applied mathematicians

In mathematics and applied mathematics, it became clear that the kinds of knowledge pursued and the style and structure of the theses produced, differ across the research groups. This impression was confirmed by a senior member of staff who said, "I think it's

1 KEI03:86; WPI06:221-3
2 KEI03:86
3 CMI07:212; WPI12:53-209
4 WPI10:97
5 WPI10:211
6 WPI10:215

absolutely correct that there are different styles, and there will be different types of expectations."[1]

Knowledge in pure mathematics is extended by introducing new structural concepts to known mathematical objects. A thesis might "introduce and investigate the concept of a nearness structure on a sigma-frame" or "introduce the concept of dimension on Frolicher spaces."[2] The consequences of such innovations are investigated by examining the properties of the new entities, deriving results analogous to known properties of similar entities and providing examples. One thesis introduces "a new class of relations" and investigates their properties and applications while others pose and answer questions about mathematical objects like, "When does a metric space have a coarser compact metrizable topology?" Sometimes the contribution is a new algorithm, proved theoretically and supported by executable computer code.[3] Theses in pure mathematics are written in a typical terse, formal style. They state and prove theorems or lemmas and describe examples with minimal discussion.

An example of the research carried out in cosmology applies "general relativistic electrodynamics to the study of plasmas on curved spacetimes" to identify "a new weakly damped plasma mode" and derives "a code for constructing the self-interacting potential V(0) of a universe."[4] Another studies "second order perturbation theories and applications in cosmology" as "a way of checking that … the linear approximation works."[5] And a third thesis shows that "the isotropic high energy BDL model is the generic past attractor in the state space of FLRW braneworld models" and proves that "the finiteness of the horizon entropy stands in contradiction with the symmetry group of de Sitter space."[6] Results include new ways to derive known equations, examples to illustrate claims, and partial results towards known problems. Cosmology theses also include philosophical reflections on the implications of the work.

The theses in cosmology consist of two or three distinct topics, usually with a common thread. For example, one thesis consists of three parts: a partial solution of a problem, a new approach to deriving known equations and a reflection on "philosophical, physical and

1 CMI23:17
2 CMD10
3 CMD10
4 CMD10
5 CMI07:88
6 CMD10

probabilistic issues."[1] This structure reflects a focus on multiple small topics which was also evident in discussions.[2] People in this research group advocated changing the format of the thesis to a compilation of papers.[3] This format is considered more appropriate for the competitive and fast-paced world of cosmology research[4] where PhD people need to publish frequently, both to secure postdoctoral positions and to avoid "being scooped."[5] Research topics in cosmology are driven by international fashions.[6] One person says that, during his master's, "the latest craze at that stage was Brane worlds and so I went into that, but I quickly realised that its days were numbered,"[7] so he chose another area for his PhD. Another person says of her research topic that it, "may change to different directions, and also follow the international trend, like which area is slightly more popular."[8]

Those working in financial mathematics are, "trying to extend research on quantile hedging and efficient hedging in a static setting … into dynamic settings"[9] or looking for an "efficient method of computing" risk measures in financial markets.[10] As with the cosmologists, this area of research appears to be driven by international disciplinary trends. Researchers say that their work stems from that done by researchers in Canada[11] and Norway.[12] The models "work well for the Western" economies but "we try to bring in some constraints and assumptions, so that it can cater now for" developing countries.[13]

Theses produced by the marine resources and rangeland modelling research groups were similar. In each a need was identified for a better model – one that was more accurate or took into account more variables – and a model was built and verified against data. There was usually some discussion about modelling techniques and sometimes comparisons with other models. One thesis sought to expand modelling techniques "from single to multi-species approaches." They model "short- and long-term consequences of undernutrition" in grazing animals in "semi-arid and arid rangeland"; "the productivity and sustainability of livestock in the succulent Karoo of Namaqualand"; "trade-offs in management of pilchard

1 CMD10
2 CMI13:107; CMI14:167
3 CMI03:60; CMI18:73
4 Cosmology being an example of what Becher calls an 'urban' specialism characterised by intense competition (Becher & Trowler, 2001: 107)
5 CMI03:112; CMI15:399
6 As Becher says, "The urban world has touches of modishness" (Becher & Trowler, 2001: 108).
7 CMI08:31
8 CMI14:147
9 CMI02:118
10 CMI16:30
11 CMI02:118
12 CMI16:48
13 CMI16:44-46

and anchovy stocks"; and "the krill-predator dynamics of the Antarctic ecosystem."[1] An interviewee said that "my research is about understanding dynamics of vegetation in an arid and semi-arid area as rainfall varies…I'm also going beyond that by looking at grazing strategies – how grazing can be used to adapt to the changes in rainfall variability."[2]

In part this research is applied. It is considered important because it "should help in the sustainable production of livestock within Africa, within areas that are arid."[3] The research is often contracted[4] and directly supports the decision-making in state institutions, for example in determining fishing quotas. But beyond the application of the model, the contribution to knowledge lies also in the improved modelling techniques and theoretical reflections about modelling. Similar combinations of knowledge for application and theoretical insights are evident in the Industrial Mathematics research group which aims to "develop contacts with industry and solve real world problems."[5] A researcher in this group is "doing area spans, classified as fluid mechanics."[6]

This department also produces PhDs in mathematics education which examine how students understand counter-intuitive concepts[7] and learn to solve problems as this PhD person describes.

> *A lot of the stuff on successful problem-solving teaching involves totally restructuring a course – decreasing the content a lot, possibly using one or other technology, things like that. I wanted to see whether it was possible to teach good problem-solving behaviour in a standard course without having to change it. (CMT23:31).*

A rather unusual thesis combined modelling with participative action research to examine decision-making in local government.[8]

In this case study we see a spectrum of drivers for research – those driven by the internal logic and interests of the specialisms, like pure mathematics, cosmology, and financial mathematics; and those driven by external interests like rangeland modelling, marine resources and education (with, of course, some blurring along the spectrum). The former

1 CMD10
2 CMI01:145
3 CMI01:161
4 CMI04:31
5 From UCT Industrial Mathematics web page at http://vishnu.mth.uct.ac.za/~myers/aims.html accessed 24 September 2008.
6 CMI06:35
7 CMD10
8 CMD10

are aligned with the concerns of the discipline as an international body, while the latter are more closely aligned with local concerns. The style and structure of the thesis and what counts as a contribution to knowledge is specific to each specialism, and as a result is determined by the researchers in each area of knowledge.

The knowledge produced in English studies

Research in English studies traditionally reflects on the concepts which authors construct in their writing. People investigate concepts such as "the sublime"; "exile, place and identity"; "representations of bisexuality" and "identity and difference."[1] The PhD people I interviewed were examining concepts of "nomadism"[2] and "landscapes and identity."[3] Many of the theses focus on the writings of individual authors (and poets and playwrights) including Guy Butler, Wopko Jensma, Zakes Mda, Lewis Nkosi and Marguerite Poland.[4] But others work comparatively with two or more authors such as Rushdie and Coetzee,[5] Buchan and Paton, "South African Indian women"[6] or eclectic combinations like "a South African in the United States, an African-American woman visiting here, and … this woman novelist from Johannesburg."[7]

The contributions which these theses make are: to understandings of concepts by particularly-positioned authors, such as "colonial manifestations of the sublime"; new perspectives on an individual, such as "a more inclusive re-evaluation of Butler as both artist and public figure"; and identifying literary shifts, such as "a radical shift in literary representation by South African black writers who wrote in English." They examine discourses that prevail across a range of writings and elucidate how the narratives support these discourses, for example: "different modes of knowledge about Africa, 'progress' and civilization were encoded in narratives of the mission, exploration, the church and military science."[8]

But there are moves away from the traditional PhD in English which was described rather cynically as, "pick up a particular novelist and then rehash the novels of that novelist and say what social meaning they have and what constructs they use and how there are

1 KED17
2 KEI03:26
3 KEI07:154
4 KED17; KEI07:154
5 KEI04:13
6 KED17
7 KEI03:26
8 KED17

similarities throughout the novels."[1] One person is using her own translations of Afrikaans poems and song lyrics to examine "how identity is mediated through poetry and song and performance"[2] and as a result her work straddles English, Afrikaans, translation studies and musicology. She was required to "have an interview to raise the issue of where I was going with this" with the music department who were "very wary about this strange woman who perceived herself as having notions of musicality, but hadn't studied music."[3] But despite reservations on the part of individual disciplines, such topics do get approved, often with the help of a supportive supervisor.[4] The respect for "academic debate"[5] even allows room for direct critique of the discipline.

> *I did my master's on vampire literature, but with a particular analogy of the critical structure. … They did not like being called vampires, which is essentially what I was saying, because I feel that critics make their name by writing about other peoples' work. (KET11:24-26)*

Supervisors say that "English is moving in very interesting directions" and "carving out new areas"[6] and this change is observed in other parts of the world where "a very wide interpretation of English studies" has made "room for new and often breathtakingly imaginative projects" (Lunsford 2006:363). One supervisor did her doctorate on magazines and shopping malls as "containers for forms of consumer culture and identity."[7] The changes are also observed in the style of the thesis. A supervisor says that "some of my colleagues … everything must be highly theorized, partly it's a male thing" but "I prefer a style that is much more experiential and the theory must be threaded through or woven in, I don't want to start with the theory."[8]

The choice of research topics is driven by individual interest. People choose topics because "that's where really, my heart lies"[9] or develop a topic by "looking for links" between two favourite authors.[10] But it is also influenced by the availability of funding. PhD people say, "there were funds available for researching black writers"[11] and that they could access

1 KET02:42
2 KET02:28
3 KEI12:70
4 KEI02:31; KEI04:37; KEI06:49
5 KEI04:33
6 KEI09:167
7 KEI02:27
8 KEI02:97
9 KEI06:14
10 KEI04:13
11 KEI11:54

national research funds because "the NRF [is] interested in pursuing, refiguring the archive of South African literature."[1] The dominant understandings of research in English, including the opening up of the discipline to new forms of literature and text, appear to be driven by the discipline (Graff 2006:372; Lunsford 2006:363), but in South Africa, the authors and texts that are engaged with are of local significance. This local focus is probably, to some extent, a result of national funding priorities.

The knowledge produced by civil and environmental engineers

Research in civil and environmental engineering is focused on solving engineering and environmental problems. Theses investigate problems of sanitation and waste disposal, water distribution, and the provision and maintenance of transport infrastructure.[2] One person is investigating "storm water management"[3] and another is redeveloping equations that describe resistance in open channel hydraulics for "the low flow conditions [in] South African rivers."[4] Those with more of an environmental slant examine "the effect of urbanization on urban rivers"[5] and the needs of macro invertebrates "in terms of basic water quality, and then substrate and velocity and depth."[6] The most theoretical of the topics was in numerical modelling[7] and planned to extend known numerical methods that are used to "solve various problems of practical engineering concern" from two to three dimensions.[8] Two of the research projects developed computer software – one a "decision support system for the design, analysis and operation of major components of small water distribution systems" and another a model "that maximizes the yield of a conjunctive use scheme" for water resources.[9]

They also address social problems or the social aspects of problems. One of the research proposals "argues that building could make a far larger contribution to job creation than at present"[10] and seeks to "develop methods of employment-intensive building construction"[11] while another sets out to "establish causes for the inability to implement large-scale, employment-intensive infrastructure programmes in the impoverished

1 KEI03:30
2 WCD18
3 WCI07:135
4 WCI03:167
5 WCI04:67
6 WCI10:23
7 WCI06:63
8 WCD12:3
9 WCD18
10 WCD14:1
11 WCD14:6

provinces of South Africa" and "to develop guidelines for implementing national programmes."[1] These research projects cross over to other fields of knowledge, for example they include research into the "physiological factors which govern the physical work capacity of the targeted labour force"[2] and into questions of social development.[3]

Like those in mathematics and applied mathematics, the theses in this department reflect the different research interests within the department. But here the influence of the research group or supervisor is primarily on the research topic, with those in the same group researching related aspects of a common problem. For example, three theses investigate different aspects of the co-disposal of sewage sludge and municipal solid waste – one focusing on reducing the cost of waste disposal, another on stabilizing the landfill processes, and a third on the conditions beneficial to organic degradation. Another two theses both examine labour-intensive ways to develop rural transport infrastructure, with one focusing on arch bridges and another on drainage structures.[4] Such related theses point to people working on coordinated research themes or different aspects of larger projects.

In this department there is less variation in the format of the theses. They usually begin by outlining an existing problem and explaining its significance. They go on to critique solutions which have been proposed or tried, and to propose a more effective solution to some aspect of the stated problem. They then devise a means of testing their proposed solution, carry out the proposed test and report on the results. Almost all the theses conclude with recommendations as to how their findings can be incorporated into practice. The research results in "material specifications and design and construction guidelines"; "decision support systems" or other computer software; "a method for evaluating cost of environmental impact"; or suggested changes to the regulatory framework.[5]

While the knowledge produced in this discipline is expressed in artefacts – protocols, guidelines, designs, specifications and computer programmes; and while there is clearly an expectation that the research will have some impact on the world of practice, there are also academic expectations. The work has "got to be original - something has got to come from the student that he can't have read and then just re-applied." For example, "if somebody's tested the strength of a rectangular beam, and if I make it triangular, there's nothing

1 WCD05:5
2 WCD18
3 WCD05:4
4 WCD18
5 WCD18

fundamentally new about that." One of the "measures of whether that has happened" is whether the results can be published.[1]

The research in this case study is driven by the concerns of the real-world which engineers and environmentalists serve, and the concerns of fellow engineers and environmentalists for better tools and techniques to carry out their practice. In some cases it appears that the research results directly from professional practice. For example, one of the theses included an extensive list of professional publications by the author; and another two-volume work reports in the second part on a project on which he was "contractee and project manager."[2] While this connection with the real world provides interesting problems and funding, as we have seen it also constrains the research.[3]

The kinds of problems being investigated and the knowledge artefacts being produced by researchers in this department, appear to directly address the pressing social and economic needs which doctoral study is claimed to benefit. However, there are doubts about whether the research is valued, as this supervisor explains.

> *Industry doesn't really value academic research explicitly. I think if you took it away, they would notice, but if you ask them, they don't really value it. We had a lunch with high profile members of industry last year, and I was actually quite disappointed with their attitude. They want BSc graduates that they can put on the production line… research master's and PhDs were not something they would encourage. (WCI05:71)*

The knowledge produced in public and development management

In public and development management, the focus of research is on the review and critique of policy and policy implementation in areas that include foreign policy, public health, education and housing provision. Theses "assess the impact of policy and regulatory interventions," compare "the policy choices" of countries, examine the governance structures for policy-making and implementation, and identify policy frameworks that impact on implementation.[4] The people I interviewed were studying "the ideological underpinnings of policy" relating to land reform in Namibia,[5] the impact of taxation compliance codes on small businesses in Kenya,[6] "the impact of anti-poverty

1 WCI05:59
2 WCD18
3 WCI05:55
4 WPD24
5 WPI01:200
6 WPI10:73

alleviation policies on rural women"[1] and the sustainability of development interventions.[2] They ask "whether fiscal decentralization increases local government revenue capacity"[3] and investigate the potential for collaboration between the public and private healthcare providers.[4] While much of the research touches on pressing social development needs, there are also concerns more germane to developed societies such as developing the telecoms industry and managing the access to information.[5] Of six completed theses examined, four consider policy in South Africa, one in Zimbabwe and one compares policies across three African countries.[6]

Research in this school focuses on local problems and processes of governing and is concerned with social consequences of policy interventions. But the theses are less focused on changing practice than those in civil and environmental engineering. Although one PhD person said that her thesis "was actually stuff that was being utilized" and that her supervisor "totally believed that whatever you do had to have practical application"[7] hers was one of only two theses which explicitly included recommendations. Instead, theses result in critique. They "assess the impact" and "explain" the results of policy interventions. One thesis argues that "low income housing provision and serviced land delivery is a function firstly of the regulatory framework, ... but it is equally a function of the intergovernmental policy framework" while another concludes that "the outcomes-led framework model leads to a system which is not only very complex and cumbersome, but also a poor basis for educational reform."[8] The question of whether it is appropriate to make recommendations in a thesis or not, is debated in the school.[9]

In this field of study, the skilled, thinking person that results from the PhD appears to be more important than the knowledge produced. PhD people argue that the PhD trains you to think rigorously so that "you can now work with any research question in any environment"[10] and that "when you read, you also look for the assumptions of what you read, when you write, you also have the issue of philosophical assumptions behind you …

1 WPI11:34
2 WPI08:81
3 WPD25:1
4 WPI03:139
5 WPD24
6 WPD24
7 WPI12:419
8 WPD24
9 "Wednesday conversation" research seminar held at P&DM on the 27th August 2008.
10 WPI12:425

it makes you think deeper into things."[1] A supervisor says that "you're forcing people to think, in an academic sense."[2] And it seems that this level of engagement matters. One of the supervisors who has had a long career in the public sector says, "I'm actually proud because we're churning out … people who work with policy issues, can understand and engage in it" and contrasts this with "when I was in the presidency, or in Limpopo, you'd get young master's guys coming up in economics, and all they could do was work a computer, not engage with the issues."[3]

Again, I observed the kind of ambivalence that was evident in civil and environmental engineering about the value of academic knowledge. A supervisor said, "I mean, when I was in government, … people would say, 'Well, I know this professor', and we'd say, 'We don't want another professor, we'll get the same garbage, another paper. Let's get in someone who has practical experience.'"[4] Academics are considered "theoretical thinkers."[5] But, despite the fact that most people in this discipline are pursuing the PhD to further their careers and are not interested in academia, it is not possible to consider introducing a professional PhD because "most of the academics here are vehemently opposed to what they would see as a dumbing-down of a PhD."[6] Despite this opposition, a supervisor says that "I think, in the end, our students do a much more practice-orientated PhD."[7]

Research in public and development management is seldom externally funded[8] and so the direction is not dictated by funders. Rather it is driven by the concerns of individuals and the research interests of supervisors. There was some evidence that international bodies such as the Global Environment Facility (GEF) and Convention on Biological Diversity (CBD) set the training agendas at master's level,[9] but not at PhD level. As has been observed in education, people doing PhDs in this department set out to "make the world a better place" (Jansen et al. 2004:88), but over the course of their studies they learn that this is not the purpose of the PhD and have to adapt to what constitutes academic knowledge.

1 WPI03:63
2 WPI09:67
3 WPI09:19
4 WPI09:51
5 WPI09:51
6 WPI04:65
7 WPI04:69
8 WPI03:327; WPI05:69; WPI08:58; WPI14:108; WPI15:205
9 WPI07:203

Similarities and differences

Despite the differences highlighted above, PhDs display several similarities across knowledge fields. They all include a review of the current state of knowledge, and this review both describes and critiques the work of other researchers. They all identify some aspect of the current state of knowledge that is lacking and seek to address this deficiency in some way. However, the approaches to be used in addressing the knowledge gap differ according to disciplinary understandings of research. The theses all make some appeal to evidence, although the nature of that evidence varies widely – from lamb mortality statistics or quality measures of water samples, to policy documents or literary works. They use a combination of deductive and inductive reasoning to draw conclusions from the evidence presented, and they meticulously record the intentions, methods, evidence and conclusions.

I observed differences in the kinds of knowledge produced. The cases selected to represent the pure disciplines (mathematics and applied mathematics and English studies) focus on theoretical knowledge while those selected to represent the applied disciplines (civil and environmental engineering and public and development management) focus on knowledge that relates to practice. The one blurred area was in applied mathematics, where some of the research groups would be more appropriately classified as hard applied disciplines and the knowledge is focused on practice.

Table 8.3: Common features of PhD theses

1. A review of the current state of knowledge that describes and critiques the work of other researchers.
2. Identifies some aspect of the current state of knowledge that is lacking.
3. A proposal to address the knowledge gap.
4. A method for addressing the knowledge gap that conforms with disciplinary understandings of research.
5. An appeal to evidence.
6. Some combination of deductive and/or inductive reasoning to draw conclusions from the evidence presented.
7. Meticulous record of intentions, methods, evidence and conclusions.

The two cases selected to represent the soft disciplines (English studies and public and development management) both focus on critique. By contrast the hard disciplines seek to not only critique problems, but also to solve them – either by proposing a new mathematical object, by developing better tools or by deriving a new protocol to be followed. It was interesting that PhD people in public and development management would have liked to propose improvements to practice or solutions to problems (and in a few cases did), but they were constrained by a strong sense among supervisors that this was

not appropriate within the PhD. Becher considers the applied social sciences to be "concerned with enhancement of professional practice" (Becher & Trowler 2001:36) but this was not reflected in this school, at least as far as the knowledge produced during the PhD. These differences across the disciplines reflect common understandings of disciplinary differences are summarized in the table below.

Mathematics and applied mathematics	**English studies**	**Civil and environmental engineering**	**Public and development management**
• Introduce or investigate mathematical objects • Derive equations to describe phenomena • Model natural phenomena and develop modelling tools • Philosophical reflections	• Reflect on literary concepts. • Critique the work of an author. • Compare the work of two or more authors. • Discuss culture as reflected in literature (broadly interpreted)	• Investigate engineering and environmental problems • Model real-world phenomena and develop modelling tools • Develop guidelines and protocols • Write software for decision making or optimization	• Critique policy and policy implementation • Assess the impact of policy • Explain the results of policy • Investigate the sustainability of policy
Theoretical knowledge – with the emphasis on solving theoretical problems	Theoretical knowledge – with the emphasis on critique	Knowledge focused on practice – with the emphasis on improving practice	Knowledge focused on practice – with the emphasis on critique

Table 8.4: The knowledge produced across the disciplines

This discussion shows that a wide variety of knowledge is produced in the course of doctoral study. What people study depends on the personal interests of the PhD person, the research interests of the supervisor, the current concerns of the discipline and on sources of funding. While PhDs are undertaken within departments with particular disciplinary allegiances, there is considerable blurring of boundaries between knowledge areas. The majority of research being undertaken has local relevance, although to some extent this reflects funding opportunities. Many PhD people expressed a concern with the usefulness of the knowledge they were producing and many projects are based on problems which they have encountered in their immediate environments.

While the academic institutions and departments retain control of how the PhD is undertaken and are concerned that the thesis represents academic knowledge, there is

considerable leeway in what can be studied and room for innovative projects, particularly across disciplines. There is, however, considerable ambivalence about the value of the knowledge being produced. This is evident both among supervisors and supervisees, but is most marked in the disciplines which have closer relationships with the world of practice.

8.5 The paradox of constrained creativity

There is something paradoxical about the PhD. On the one hand it is expected to result in new knowledge; PhD people are expected to work at the frontiers of knowledge and to "extend the boundaries of knowledge."[1] But at the same time it serves to credential the individual, to certify that they are able to do appropriate *disciplined* research. It serves a gate keeping role, controlling who may claim to make knowledge. Are these objectives in conflict? Does the need to work within academic disciplinary rules limit the scope for creative work? How does the PhD fulfil these dual roles of control and innovation? In this section, I consider this paradox.

Disciplinary authority and boundaries

A useful way to think about knowledge is in terms of landscapes, a metaphor developed by Becher in "Academic tribes and territories."

> *It seems natural enough to think of knowledge and its properties and relationships in terms of landscapes, and to saturate epistemological discussion with spatial metaphors: fields and frontiers; pioneering, exploration, false trails; charts and landmarks. (Becher & Trowler 2001:58)*

Knowledge can be conceived of spatially with similar knowledge clustered together into disciplinary realms which share frontiers with related disciplines and have trade relations with more distant disciplines (Becher & Trowler 2001:58). The metaphor also invites images of war or at least political intrigue as boundaries must be demarcated and defended.

Disciplines control their borders by deciding what will be taught, what matters may be investigated, what research questions can and cannot be asked (Boden 1995), and what will count as new knowledge (Becher & Trowler 2001:50). The PhD is used to control who may make pronouncements about the knowledge in the discipline. It is a license to generate knowledge within the knowledge field, granted only to those who properly understand and subscribe to the values and norms of the discipline. In the course of the

[1] WCI02:7

PhD, people are expected to learn "the modes in which arguments are generated, developed, expressed and reported" and "the epistemological implications of the ways in which others' work is evaluated" (Becher & Trowler 2001:46).

The supervisors, already authorized to generate knowledge, are representatives of the discipline tasked with exercising control over the research undertaken and the methods used. Supervisors are involved in selecting research topics and shaping research questions; research proposals are reviewed by authorized members of the discipline; and research topics have to be approved by a committee of supervisors. The degree to which control is exercised depends on the degree to which the PhD person has properly understood and internalized the boundaries and norms of the discipline. For those who operate within these boundaries and norms, there is little need for control. However, members of the discipline may be shocked by attempts to move beyond the borders and respond by exercising greater control.

> *Well, first of all they said that it didn't just concern English, it crossed into the department of Afrikaans and translation studies. They didn't really seem to have a problem with translation studies … however, it also crossed musicology, so I had to go to the music department and have an interview to raise the issue of where I was going with this and how I would actually understand these notions of music. … My department, I think, went into shock … they were also concerned because it also made a foray into the area of popular culture, which is an area of study on its own. (KET02:70-84)*

This control is sometimes exercised directly…

> *[The head of department] had come to me and said "Discard your idea – it's not considered a real English text. It's translated work." So I said, "With all due respect, you study Derrida and Lacan - French theorists. They are translated. So where are you drawing the line?" … "Oh no, no, no, no. It's not a feasible idea." (KET01:49)*

… and sometimes indirectly, through social censure…

> *I was doing the metaphor of food in Latin American literature, and there was so much resistance toward it … I had people coming up to me asking, "How's your foodie thing going?" And that rubbed me the wrong way. So eventually I just stopped talking about it. (KET01:49-51)*

At the PhD level, research is expected to be independent with people choosing what they research. But the supervisor directs the process even when they believe that they ought not to as this quotation clearly shows.

> *I don't think it should really be the role of the supervisor to specify the project … the supervisor should say to the student, "Come up with something, and then we'll talk about it." … I've often had very clear ideas in my mind as to what I want done and what needs to be done and I've tried not to tell the student that. I've said, "this is the problem, try something", and maybe I've been manipulative, because I've got that vision. I say, "Well, what about this, what about that?" But eventually they think that they've done it. (WCI05:123)*

Some disciplines have been able to establish tight control over their intellectual territory. These sovereign realms are Bernstein's *singulars* "whose creators have appropriated a space to give themselves a unique name, a specialized discrete discourse with its own intellectual fields of texts, practices, rules of entry, examinations, licenses to practice, distribution of rewards and punishments" (Bernstein 1996:65). But in what is termed the fractured-porous disciplines (Ambrose 2006:75), there is scope for pushing boundaries and people who persist do find support for unusual research directions. In particular, this widening of the disciplinary boundary has been recognised in English studies. Lunsford, of the Department of English at Stanford says,

> *Look around at the projects graduate students are working on now, and you will find a very broad definition of "literature" and of reading – a definition that clearly includes film, video, multimedia, and hypertext, and discourses not traditionally thought of as "literature" (such as Deaf and Spoken Word poetry, cookbooks, tombstone inscriptions) right alongside studies of canonical writers and their print texts. In terms of "writing", an expanded definition is also clearly emerging, as what counts as writing now often includes sound, video and images of all kinds, as well as a wide and growing range of genre and discourses, from African American vernacular English to Spanglish to American sign language. (Lunsford 2006:363).*

As I noted in chapter four, many of the doctoral people in this study worked across disciplinary boundaries. As one woman expressed it, "learning and study and research isn't contained in individual boxes, but often spills over, splashes here and there."[1] And despite

[1] KEI12:74

attempts to defend established boundaries, there is overall acceptance that knowledge boundaries are becoming more permeable. In fact some departments actively seek closer relationships with adjacent knowledge areas, making space (physically and intellectually) for more cooperative work.

> *We want to have a bridge between [mathematics] and computer science. Many of our majors are computer science students or joint majors with mathematics and computer science, and it seemed appropriate that we present joint courses, so we have a joint honours programme, and to maintain that, we have to have a certain critical mass of researchers in that area. (CMI23:9)*

Bernstein sees the classification of knowledge into disciplines by implementing boundaries as important sources of power and control.[1] Classifications are termed strong or weak according to how effectively they insulate between categories (Bernstein 1996:21) and the growing permeability of disciplines represents a weakening of classification which is accompanied by a loss of power and control (Bernstein 1996:66). But contrary to this conceptualization, the ability of departments to embrace neighbouring knowledge areas appeared rather to increase their power base. For example the department of mathematics and applied mathematics, which had succeeded in incorporating a wide range of research groups with strong associations with other knowledge domains, appeared to flourish as a result. Embracing permeability gives access to funds, increases visibility and prestige and allows smaller departments to establish a critical mass of staff and postgraduates.

Knowledge for application

Reviewing the theses produced in the four academic units, it is clear that the research topics studied by doctoral people in South Africa are driven mostly by local concerns. They take known methods and adapt them for local conditions; they build models that describe local conditions; they investigate problems of development. The only exceptions to this were found in cosmology and pure mathematics which are driven by international disciplinary concerns and financial mathematics, where the research appears to focus on the concerns of developed financial markets. Furthermore, PhD people are concerned with the usefulness of the knowledge which they generate. One person values the fact that her research will "feed directly into a national programme that will seriously contribute to

[1] But he distinguishes between power and control. Power constructs and operates "on relations *between* categories" while control "establishes legitimate forms of communication" within the categories (Bernstein 1996:19).

raising the quality of life for a large number of people"[1] and another says that he wants "to prove it to myself as it were, that it can be made useful."[2]

This concern with useful knowledge goes against the tradition that universities concern themselves with knowledge for the sake of knowledge, and not with the application of knowledge (McClelland 1980:125). It is at this frontier between academic and applied knowledge that we find ongoing skirmishes. As we saw in chapter four, institutions and some supervisors support the scholarly view of the PhD, viewing it as an academic qualification which results in academic knowledge and ways of thinking. Even supervisors who are more inclined to an ongoing development perspective of the PhD, insist that a PhD can't be awarded for applied knowledge alone.

According to Bernstein, "attempts to change degrees of insulation reveal the power relations on which the classification is based and which it reproduces" (Bernstein 1996:21). This is particularly evident in the vehemence with which academic staff in South Africa oppose professional doctorates.[3] The insulation between theoretical academic knowledge and applied practitioner knowledge confers on academics greater status and legitimacy (Bernstein 1996:19) while professional doctorates are considered a "dumbing down" of the PhD[4] in a clear indication that practitioner knowledge is considered to be of a lower level than academic knowledge.

But as I discussed above, the two cases selected to represent applied knowledge took different stances in their relationship with practitioner knowledge. In public and development management the insulation was strong. Many (but not all) supervisors frowned on PhD theses which made recommendations for practice and, despite wanting to solve real-world problems, their supervisees generally acceded and limited themselves to commentary. However, in civil and environmental engineering, all the PhD theses ended with recommendations for practice and included practitioner texts like protocols, designs and specifications. In this discipline there is less distance between the custodians of academic knowledge and the custodians of practitioner knowledge and the professor of

1 WCI02:195
2 KEI04:20
3 WPI04:65; WPI14:29. In addition conversations with academics and an interview with someone who tried but failed to introduce a professional PhD in Education confirmed that there is strong oppositions to the professional PhD in South Africa.
4 WPI04:65,69

engineering is equally comfortable being identified as an engineer, as he is being identified as a professor.

The interviews reveal conflicting views of whether people value academic and practitioner knowledge. Some staff say that "people who do PhD's are theoretically inclined"[1] while others say that "their focus is on how this is going to work in practice."[2] Even those PhD people who begin their work concerned with solving practical problems, come to value academic knowledge during the course of their studies. They say "I think you need both, I don't think you can do one without the other."[3] This opinion is supported by La Grange who considers "how democratic values can be (re)constructed within social practices such as educational research" (Le Grange 2002:36) and argues for research that is *praxiological*, meaning that "the research represents a conscious and continuous interplay between theoretical and practical considerations" (Le Grange 2002:39).

The question of what kinds of knowledge should be valued is further complicated in the South African context, by the history of colonial and apartheid education. As we saw in chapter two, these both acted to exclude large parts of the population from access to knowledge that was academic or scientific. There is ongoing ambivalence about whether to embrace or reject such forms of knowledge. Concerns with imposed knowledge categories that aligned with European (mostly British) conceptions of knowledge, led in South Africa to debates on Africanisation with the demand that "African scholars must also be able to critique and challenge external knowledges from their own perspectives, to reconstruct them for their own purposes, and to generate their own theories, models, analytical tools" (Szanton & Manyika 2002:16). These debates included a shift towards useful knowledge, with one of the chief protagonists of Africanisation suggesting that the "pursuit of knowledge and the truth for its own sake is a dead concept, untenable in almost all modern societies" (Makgoba 1998:50).

Concerns in South Africa to do research that has application are driven less by the knowledge economy discourses that are prevalent in other parts of the world and more by a social justice discourse. At the level of national policy, PhDs are expected to help to address pressing economic and social problems and many doctoral people are driven by

1 WCI08:161
2 WPI04:69 also (Motala 1991)
3 WPI12:429 also (Jansen et al. 2004)

similar concerns. However, doctoral people also express doubt that their research will be able to contribute to such problems.

> *But how to measure the use of those results, I think is difficult. At least for an area like public and development management. Business school is fine, I mean, so you've come up with this innovative way of saving money for corporates. That's easy. But development and poverty eradication – we've been battling with this for the last, what, fifty years? And no-one's come up with a real solution. (WPI08:39-43)*

It is possible that research which has application will gain greater acceptance. Certainly there is support for applied research at the level of national policy. The new higher education qualifications framework says that the PhD "may be earned through pure discipline-based or multidisciplinary research or applied research" (DoE 2007:29).

Creativity

Developing new knowledge depends on what is broadly termed innovation of which creativity is considered to be a key element (Schweizer 2006) and promoting creativity in higher education is viewed as desirable (Wits 2005:3). Thus it might be pertinent to ask to what extent is the research undertaken at doctoral level creative? While early research viewed creativity as an inherent aspect of personality and associated different personalities with different types of creativity (Kirton 1987), later research acknowledges that creativity is not a special gift. It involves ordinary capabilities like noticing and remembering (Boden 1994), and is a function of a combination of inherent abilities, learned skills and environmental factors (Sternberg 2006:88). Increasingly, creativity has come to be seen as a social phenomenon in terms of how it is understood, valued and encouraged (Cropley 2006:125).

Much research has focused on the need for divergent thinking, associative memory and analogic thinking (Boden 1994), particularly in the early stages of generating ideas, although more recent research has indicated that there is also a need for convergent thinking in the later stages (Nyström 2000:111). The process of generating ideas depends on the intellectual abilities, knowledge and styles of thinking of the individual (Sternberg 2006:88); on skills in pattern recognition, the use of schema for problem solving and the creation of analogies and mental models; and benefits from an environment in which there are opportunities for casual interactions that encourage cross-pollination of ideas and access to different knowledge domains (Haring-Smith 2006).

Understanding what constitutes original research is difficult. "I think candidates often find originality very difficult to understand … after all, a new synthesis is original, though none of its elements are."[1] And even supervisors find it difficult to articulate. They say "at the most pedestrian level - it isn't derived from other work, and that's checkable, easily checkable"[2] but such checking does not go beyond the most pedestrian level. And one person expresses doubt as to what originality might mean, "strictly speaking, there's nothing left remarkable – and I mean in every field, including sciences – just put things together differently, and perhaps more functionally each time."[3]

Boden (1995) discusses the centrality of conceptual constraints in the creative process. She argues that the most interesting creative novelties are those that could not have arisen before. Ideas arise within a particular conceptual space – such as Impressionist art or Euclidean geometry. These conceptual spaces contain inherent constraints that delineate a range of possibilities, and exploration of the spaces usually takes place within that range of possibilities. However, the most creative novelties are those that step outside of this range of possibilities and they very often arise from the removal of a conceptual constraint – for example the development of non-Euclidean geometry by dropping the requirement that parallel lines do not meet (Boden 1995:2-3). It is this process of asking "impossible" questions that gives rise to entirely new domains.

However, research into creativity has largely focused on the creativity of responses to some stimulus and has left relatively unexplored the processes of identifying problems or posing interesting questions (Kaufmann 2004:160). Research that emphasizes the role of open-mindedness in creativity suggests that interesting problems can only be posed if the questions are allowed to develop and grow in the process of exploring solutions (Haring-Smith 2006). Boden argues that creativity can only be understood with reference to a particular conceptual space – one requires an understanding of musical expression in order to be able to recognise a pianist whose style is original. And, in order to be able to challenge the constraints of a conceptual space, one needs to develop exceptionally rich and deep cognitive maps of the space (Boden 1995:6). There are "norms about breaking the norms" (Cropley 2006:126) and these need to be understood in order to ask questions that will be viewed as creative rather than simply disruptive.

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1 KEI01:39
2 KEI01:37-39
3 KEI01:41

Consequently we must expect that notions of creativity differ across academic disciplines. The disciplines which have weak boundaries and internally contested conceptual frameworks are likely to be more open to different methods of inquiry and diverse ideas, while those with firm boundaries and uncontested conceptual foundations tend to use specific methods and have less scope for challenging existing constraints (Ambrose 2006:77). This was observed in the case studies with people in mathematics and civil engineering less likely to produce research that seriously challenged the conceptual foundations of the discipline. It was in English studies where the most controversial research topics were found and where people were more likely to challenge the boundaries of the discipline.

Research topics may be determined by the interests of the supervisor[1] or the research group or department.[2] A research topic should be well defined[3] and reasonably likely to result in publishable results[4] and supervisors are expected to be able to make judgements about what constitutes a good topic.[5] For those who do construct their own research questions, the process needs to be open-ended, with the opportunity to explore, to get sidetracked, to develop deeper understandings and to revise the problem along the way.[6]

While some experienced great freedom in their research, one person's idealism about science had been replaced by cynicism. They starting out "wide-eyed and so excited" about knowledge as an undergraduate, "I really did think that everyone was working towards the bigger body of knowledge and… as long as your science was good, it would be accepted." But later found out that, "There are some very powerful people who've got long careers and proven themselves and they obviously carry a lot more weight. So if they throw out your idea right in the beginning, there's little chance that anyone's even gonna look at it."[7] In response they selected problems that "I know will be publish-worthy in a short span of time."[8] Another thought that the pressure to publish meant a proliferation of papers announcing incremental results and little incentive to fully develop a general case, "Essentially the same tools are being applied; it's just the model that changes slightly."[9] This

1 CMI08:14 also CMI05:68
2 CMI01:77; CMI21:8
3 CMI08:62
4 CMI02:36; CMI05:32; CMI14:70
5 CMI13:52 also CMI07:70; CMI08:10; CMI13:52; CMI14:80
6 WCI02:56 also CMI07:42; WCI04:108
7 CMI05:44
8 CMI05:32
9 CMI08:78-80

person felt that, far from contributing to knowledge, their study was "contributing to the clutter of information."[1]

In general risk-taking is not encouraged in the PhD. Rather people are encouraged to be pragmatic in selecting research topics that can be completed in the required time-frame and that can be investigated using well-known research methods. People who study full-time are particularly constrained by funding. Those who are employed and study part time in an area related to their employment have more scope for taking on ambitious projects because they have access to research sites and equipment. The scientist who is doing a country-wide study of invertebrates says that, "If I had to do it full-time, I probably would have stuck to one order, I wouldn't have attempted to do four, and I would have done a little bit, maybe just the northern part of the country."[2]

While the PhD does develop skills in asking research questions, whether people experience the process of arriving at a research question as an exciting creative journey or a series of cynical strategic choices, differs by student, supervisor and discipline.[3] It appears unlikely however, that many PhD theses will transform the conceptual spaces in which they work since those that are inclined to ask impossible questions encounter time and resource constraints which push them towards modest and safe projects, "rather than research for pleasure, significance and originality" (Leonard 2001:41-42).

8.6 Conclusion

In this chapter I have examined the outcomes of doctoral education – the skills people learn, the kinds of people that they become and the knowledge that they produce. The explicit expectations of the PhD include that the graduate should possess research skills and should have undertaken a significant research project resulting in a contribution to knowledge. Less explicit expectations are contained in the different views of the PhD.

According to the reports of PhD people, they learn about the area of research and adjacent knowledge areas, they learn academic professional skills and they learn research skills which have application to academic and research careers. They also learn more generic skills which have broad application. Certainly the explicit requirements of the doctoral graduate are met. But doctoral people also change during the course of the PhD. Some undoubtedly

1 CMI08:80
2 WCT04:48
3 For more about how doctoral programmes support creativity, see (Backhouse 2007a)

do become scholars and critical intellectuals. All learn to appreciate the knowledge forms within their discipline.

There is concern among PhD people that their research be useful, and this is driven by a social justice discourse that seeks to address pressing social and economic problems, rather than a concern with instrumentalist knowledge. Particularly those coming to doctoral studies from outside of academia are concerned to solve real-world problems. However, during the course of their studies, they develop an appreciation for academic ways of knowing and learn to place more value on theoretical and evidence-based knowledge.

The knowledge which results from doctoral research in South Africa is locally relevant and driven by local concerns, with the exception of a few research specialisms. While disciplinary discourses direct research and to some extent dictate what research questions can be asked, supervisors are open to and supportive of unusual research directions and the academy does support creativity in the PhD. Doctoral research is constrained by access to funding, time and other resources. These limitations mitigate against large-scale, and far-reaching research.

Chapter 9

CONCLUSIONS

What do I make of all this?

9.1 The focus of this research

So, what do I make of all this? How do existing models and pedagogies of doctoral education shape the learning experience and the outcomes of doctoral programmes in South Africa? What new or unexpected insights has this research revealed? In the context of ongoing global debates about the nature and purpose of the PhD, this research set out to investigate the current state of doctoral education in South Africa. I took a broad, systemic approach and examined the people involved in doctoral education, the processes that they were engaged in, and understandings of the goals of the system and the intended outcomes. While I began by focussing on the models and pedagogies of doctoral education, the subjectivities of doctoral people revealed themselves to be prominent parts of the PhD practice, which influenced the practice. But these subjectivities were in turn produced (or suppressed) by the subtle dynamics and discourses of the models and pedagogies of doctoral education in never-ending iterative loops.

In section 9.2 I revisit the research questions, examining in turn each of the four sub-questions which I posed in chapter one and reflecting on the insights provided by the study. Section 9.3 discusses some unanticipated observations which surprised me in the course of this research. In section 9.4 I reflect on the study. I summarize the contribution which it makes to knowledge, I discuss the limitations of this research and highlight areas for further study and I reflect on my own role in the research.

9.2 Revisiting the research questions

I set out to examine this primary research question: **How do existing models and pedagogies of doctoral education shape the learning experience and the outcomes of doctoral programmes in South Africa?** I structured the investigation into the following four sub-questions:

1. What expectations of doctoral programmes are expressed or implied by national planners, academic supervisors and doctoral candidates?

2. What models of doctoral education are in use in South Africa and what pedagogies are employed in these models?

3. What are the learning experiences of doctoral people and how do they relate to the models of doctoral education in use?

4. What kinds of learning and knowledge result from doctoral studies?

In this section I revisit these questions and review the insights which emerged.

What is expected of doctoral education?

There is no common understanding of what the Doctor of Philosophy degree is. Rather there is a range of views, often conflicting, and often very strongly-held. This situation is not unique to South Africa, and has been widely and persistently observed in higher education. The nature of the PhD is and has long been contested. This study identifies three clusters of views of the PhD in the South African context: the scholarly, the labour market and the ongoing development views. Institutional procedures are dominated by the scholarly view while supervisors express views along a spectrum that ranges from the scholarly view on the one side to the ongoing development view at the other. The labour market view is expressed in national policy.

The scholarly view holds that the PhD entails doing a substantial research project, in the appropriate manner for the discipline, in order to contribute original knowledge to the field. In the process one displays evidence of scholarship. In this view the focus is on the knowledge produced and doing research. The labour market view holds that the PhD is about developing high-level skills for the economy and that the research is done in order to develop those skills. The focus is on generic and transferable skills which can be applied to knowledge generation in a range of settings. The ongoing development view positions the PhD as part of an ongoing process of personal and professional development. It is concerned both with generating knowledge and with developing an individual.

The kind of person that is expected to undertake and result from the PhD is different from each of these perspectives. The scholarly view assumes that only those who are "research material" will embark on the PhD and that the process is one of revealing this independent, rational scholar. The labour market view is underpinned by discourses of the knowledge economy and the market and while it is concerned with the person rather than

the product which results, it takes an impersonal view of doctoral education; the goal is to produce a skilled human resource. On the other hand, the ongoing development perspective with its social justice discourse, takes a wider view of who might embark on doctoral studies and aims to produce a critical intellectual, able to engage with knowledge in an academic way.

People undertake PhDs because they are want to learn more or to generate knowledge, often in the interests of solving or understanding particular problems. Many also see it as advancing their careers and many study for personal satisfaction and growth, often inspired by long-held fantasies about the pursuit of knowledge. They seldom have a single reason for undertaking the PhD. Rather it results from accumulated influences over their lives combined with the right circumstances and opportunities. People come to the PhD with expectations which are related to the reasons they have for studying, how old they are, what work experience they have and what work they intend undertaking in the future.

Many of the people doing PhDs in South Africa are mid-career academic teachers who undertake doctorates because the qualification is necessary for promotion within the academic workplace. Some of these people use the PhD to expand their academic practice into research, but many of them value the PhD because it develops the depth and breadth of their knowledge, and gives them credibility. So that some embrace the scholarly view of the PhD, and others tend towards the ongoing development view of the PhD. A few acknowledge more openly the labour market logic behind their decision. Others who do PhDs are younger people setting out on academic research careers for which the PhD is a prerequisite. For them it offers an opportunity to establish themselves as researchers and to gain skills in other aspects of academic practice. For these people the PhD is more obviously about displaying the scholarship on which they hope to build their careers and they tend to be more comfortable with the scholarly view of the PhD.

Then there are people who come to the PhD already established in careers outside of academia, and a few younger people who complete PhDs at the beginning of non-academic careers. These people undertake PhDs to enhance their careers and in pursuit of knowledge to address specific problems. They value research skills in as far as they can be applied in other contexts and they value the academic perspectives on knowledge which they develop during the PhD, but they are less interested in understanding the academic context or in building a research record. And for people who lead a nomadic existence

moving in and out of academic work over time, the PhD offers greater flexibility in their careers as well as opportunities to explore knowledge and develop new ways of thinking.

For people who work outside of the academic environment, the PhD is more often about improving their credentials or about exploring knowledge as part of their ongoing development. They are inclined to see the scholar as a theoretical thinker, somewhat out of touch with reality or as a person of exceptional brilliance with whom they cannot identify. For these people, their pursuit of the PhD is more often driven by their own pursuit of personal and professional development or by the labour market view. Some of those who work outside of the academy and are more familiar with the market discourse, think of themselves as skilled human resources. They are proud of their skills and not inclined to be offended by being reduced to human resources.

These competing discourses about the PhD seem to be always present with many supervisors and PhD people expressing a mix of views. However, differences in emphasis can create mismatches between what people expect and what they get from doctoral education. For young academic researchers, the PhD is more likely to coincide with their expectations, but for others there is the potential for significant gaps between their expectations and what they encounter.

Models and pedagogies

When I began this research I had hoped to make use of Lave and Wenger's ideas about situated learning in a community of practice (Lave & Wenger 1991) as a model for doctoral education (Backhouse 2006a) and my experience of having been a doctoral student in mathematics supported that idea. I was at the time the only full-time doctoral student in a small department. There were two full-time master's students who shared the office opposite mine. We felt that we were members of the department. We attended research seminars as part of the active topology research group, tutored undergraduates and spent tea and lunch time with the other staff members. I was a postgraduate representative on Senate and took an interest in how the university functioned. Conversations were about the university, about the undergraduate programmes and about topology. I felt that I was part of a community and learning the practice of academic work.

However, the more I engaged with the case studies, the more I realized that I was not observing communities of practice. Most fundamentally the people involved do not necessarily engage on an ongoing basis with each other around the work they do which is

part of how communities of practice are defined (Wenger 1998:49). I considered introducing the notion of *sparse communities* to describe communities that had infrequent contact, and I discussed this idea with Wenger when he visited the university in June 2007.[1] But even that would not account for the situation in for example the English studies case, where it was common for people to complete a PhD without having any contact with other PhD people in the department. The more I explored the cases, the more I became convinced that while communities of practice could be used to describe the functioning of some of the research groups, it was not widely applicable to doctoral education in South Africa.

The model of doctoral education that prevails in South Africa is based on independent study and much of the learning is carried out alone with the PhD person reading, thinking and writing. In addition, they engage with their supervisors around the research, around texts such as the proposal and thesis and journal papers, and around administrative artefacts like progress reports and supervision agreements. The pedagogies of supervision include interactions planned for doctoral people such as supervision meetings, doctoral seminars, courses and the journal club. They also include interactions not directly targeted at doctoral people, but in which they participate, such as research seminars, conferences and client meetings.

Doctoral education in South Africa continues to be structured around the supervision relationship, but with considerable variation. I observed four different patterns of practice which I called the individualist, loose cohort, networked and small team patterns. These patterns differ in the extent to which PhD people interact with others and the extent to which these interactions are related to the research.

In the individualist pattern, the PhD person engages only with the supervisor around their research, and there is little interaction outside of the supervision relationship. The loose cohort pattern entails PhD people coming together for some shared learning activities with a range of academic staff, in addition to pursuing their individual research. It offers some social interaction with members of the cohort and some contact with other supervisors, but seldom around the research. The networked pattern, in which people share offices and have regular contact with people who research in the same broad area, while working on individual research, offers interactions that are social and sometimes concerned with

[1] Discussion document prepared 1st June 2007.

practical aspects of doing research. Only the small team pattern in which people work as part of a research team on closely related projects or aspects of a larger project, facilitates ongoing engagement with a group of people around common research. The small team is the only pattern in which a community centred on research practice was observed.

Which models of doctoral education emerge depends on factors such as the number of people enrolled for doctoral studies, the number of people working with a particular supervisor, the existence of research groups within the academic unit, whether people study full- or part-time and the funding arrangements for doctoral study. The distribution of the patterns of supervision practice across the case studies was uneven. All three of the individualist, networked and small team patterns were observed in mathematics and applied mathematics and in civil and environmental engineering. In English studies all supervision was in the individualist pattern, and in public and development management the loose cohort pattern dominated but the individualist and networked were also observed.

Supervisors develop their own supervision practice, influenced by their experience of being supervised, their understandings of the goals of the PhD, and the needs of their supervisees. Sometimes they work with groups of research students together as a way to deal efficiently with a large supervision workload. To some extent their practice depends on the nature of knowledge generation in the discipline. For example, supervisors in English studies are more concerned with text and writing while those in mathematics and applied mathematics are more concerned with identifying challenging but solvable problems. Their practice is also influenced by the academic unit, the faculty and the institution in which they work as these structures impose procedures to be followed. For example where supervision agreements were introduced, supervisors incorporated these into their supervision practice.

In the past, all of doctoral education was invested in the single relationship between supervisor and supervisee, and this continues in some cases. But doctoral education is increasingly becoming the concern of a wider group of people. The practice of co-supervision was evident in three of the cases. But in addition to formal supervision, a supervisor might be called on to lead seminars for a group of doctoral people; to read and review the proposals or theses of people which they do not directly supervise; to critique presentations of doctoral research; and to sit on committees that consider research proposals or examiner's reports. In addition, institutions provide writing workshops,

seminars in research methodologies, experts in statistical analysis, editors and librarians to assist the doctoral person. Doctoral education is becoming more formalised and in the process there is increasing division of labour and specialization in the multiple tasks surrounding it. Increasing the number of people involved with supervision makes the PhD person less dependent on a single supervisor and the scrutiny of colleagues may prevent more abusive supervision relationships.

PhD people find themselves embedded in a pedagogic network that includes their supervisors, collaborators and other members of the academic staff; specialists in writing, research methods and the use of tools or techniques; administrative staff who help them to navigate the institutional requirements; and colleagues who share expertise or provide emotional and practical support. To the extent that they have a sense of their own agency, this network is under the control of the PhD person; he or she can initiate connections and shape the network according to his or her needs. Gibbons et. al. have argued for organisations with denser communication networks (Gibbons et al. 1994:142) in which "flows are more important than structures" (Gibbons et al. 1994:146) and it may be that these are what we are seeing emerge in doctoral education.

Learning experiences

The experience of doctoral study has been shown to be a major contributing factor in persistence and success (Bair & Haworth 1999; Lovitts & Nelson 2000). As a result there have been investigations into how academic units can improve the experience. Suggestions that emerge include for example, providing better integration into the department (Earl-Novell 2006); implementing cohort models with better social support (Ali & Kohun 2006); and improving supervision (Dietz et al. 2006).

In this study PhD people identified elements of the doctoral programme and the circumstances in which they studied that impacted on their experience. These included the quality of supervision, opportunities to engage with other people around their research, a range of structured and individual activities that support learning, opportunities for social and emotional support, the access they have to resources and funds and the personal sacrifices which they have to make. To the extent that these elements are within the control of the institution or academic unit, it may be possible to improve doctoral education by making changes to the programmes.

However, it does not follow that such improvements will necessarily lead to better experiences. In considering questions of how school effectiveness and teaching styles impact on pupils in the school system, Moore concludes that research points "to a number of ways in which different aspects of school organization and educational processes *might*, under various circumstances and in different ways, have varying effects, both positive and negative, upon different categories of pupils," but he concludes that "the extent to which this is so must be settled pragmatically for particular cases" (Moore 2004:33). His observations appear to hold true for doctoral education as well.

Interventions to improve doctoral programmes need to take account of the differences between doctoral people. Researchers have recognised that the kinds of support sought by individual PhD people differ and have called for flexibility in doctoral programmes (Frame & Allen 2002:102). Others have suggested that the research culture which people expect and thrive in differs according to their motives for study (Deem & Brehony 2000:153). In this study it became clear that people undertake doctoral study for a range of reasons and at different points in their lives and careers. They have different expectations and seek different levels and kinds of support. In order to make sense of this plethora of motives, expectations and needs, I introduced the intersecting contexts model for doctoral education in chapter five.

The intersecting context model is offered as an alternative to McAlpine and Norton's (2006) nested contexts model which places the doctoral person at the centre of a series of concentric contexts that include the supervisor, the academic department and the institution. Their model is strongly focused on the academic context, but for many PhD people in this study, the academic context does not dominate their doctoral experience and contexts outside of the academy are sometimes equally or more important. The intersecting contexts model places the PhD person at the centre of a number of intersecting contexts, some academic and some not, with each person having a unique combination of contexts, some of which are more important than others.

In chapter seven I used the concept of congruence between the PhD and the contexts of doctoral study, as a means to understand how the various contexts contribute to the doctoral experience. A context is congruent with the PhD if it provides the elements identified as important by doctoral people – supervision, opportunities to engage around research, a variety of learning activities, opportunities for social and emotional support, and

resources without requiring distressing personal compromises. What was interesting was that this congruence was found in contexts other than the academic contexts of the supervisor, academic unit or academic institution. For some people, the workplace and the family were found to be more congruent than the academic department and for such people, providing greater congruence in the academic contexts may have no benefit.

Boud and Lee suggest a shift in emphasis from supervision and the *provision* of doctoral education. They argue that the provision of better supervision and a rich environment is not sufficient. Rather there needs to be a discourse which enables students to take up opportunities (Boud & Lee 2005). They give the example of two students – one who feel disempowered by the experience of "becoming a student" having previously been an academic and the other who feels inspired by the process of "becoming an academic" (Boud & Lee 2005:508). Their research inspired my concept of congruence between the contexts of doctoral education and the subjectivities of the PhD person. The extent to which people are able to take up the range of possibilities available in the pedagogic network described above, and the extent to which they are able to develop and manipulate their own pedagogic network to meet their needs, depends on the extent to which the contexts they study and work in support a range of subjectivities which are not at odds with their own identities. For someone not aspiring to an academic identity, the context of the workplace may be more empowering than the academic contexts.

Learning and knowledge

So what kinds of learning and knowledge result? The explicit expectations about what is to be learned during the PhD focus on research skills. People should learn how to ask research questions, design research projects, carry them out and communicate the results. In the process they should generate original knowledge and develop an appreciation for appropriate disciplinary modes of enquiry. PhD people in this study say that they do indeed develop such skills in doing research. And they obviously develop specialist knowledge about their area of research and about related knowledge areas. They also develop generic knowledge skills – ways of finding, analysing and communicating information which can be put to use in many knowledge focused contexts. Those who study full-time, particularly in the pure disciplines, report learning academic professional skills, while all increase their knowledge of themselves and learn interpersonal skills.

That the PhD results in knowledge is perhaps the one thing on which the three views of the PhD and the people doing PhDs agree. The most tangible evidence of that knowledge is the thesis. PhD theses are similar in a number of respects. They all review and critique the current state of knowledge; they all identify some gap in that current knowledge which they will try to address; they all appeal to evidence, although the nature of that evidence varies by discipline; they use deductive and inductive reasoning to draw conclusions; and they record the research intentions, methods, evidence and conclusions. But they also differ by discipline, by specialism and by research group. These difference reflect the kind of knowledge which results from the PhD. Those in the cases representing the pure disciplines were interested in more theoretical, abstract knowledge; while those in the cases representing the applied disciplines focussed on knowledge for application. The hard disciplines of mathematics and civil engineering sought to solve problems, while the soft disciplines of management and English studies were concerned with critique.

I was surprised by the extent to which the research being carried out by doctoral people crossed boundaries between specialisms and between disciplines. Researchers in civil engineering study the physiology of the workforce; those in mathematics of finance need knowledge from economics; and those in English studies stray into the territories of musicology and translation studies. Other elements of Mode 2 knowledge production are also evident. Doctoral people work as part of larger teams on commissioned research with bodies outside of the university[1] or they work outside of the university and undertake research directed at concerns within their work environments.[2]

With the exception of a few specialisms, the knowledge produced during doctoral studies in South Africa is focused on local concerns and driven by local needs. People seek to address local resource problems by modelling fish populations or considering the sources of municipal funds. They develop models for local conditions which are not addressed by prevailing models developed in other parts of the world. They critique local authors, poets and playwrights. To some extent this is a reflection of funding that is targeted to local issues, but it also reflects the prevalence of utility and social justice discourses among those who undertake PhDs. They want to solve problems, and to produce research that is relevant and has application.

1 CMI04:31; CMI22:67; WCI03:119; WCI05:27
2 KEI07:154; WCI04:279; WCI10:19; WPI07:41; WPI12:419

The British system of graduate education on which the South African is modeled, is premised on the idea of increasing specialization culminating in the doctorate (Clark 1995:79-80) so that research that is carried out across disciplines and across institutional boundaries is at odds with traditional notions of the PhD as generating specialist disciplinary knowledge. And the move towards knowledge for application is at odds with traditional understandings of academic knowledge as abstract, theoretical and general. These trends indicate shifts in the South African PhD.

I was not able to identify clear causal links between the models and pedagogies of doctoral education and what is learned, with people across the case studies reporting similar learning. But there were some connections. Those who study full-time in a school or department were more likely to learn academic professional skills. Those working in small teams were likely to be funded as part of larger projects and have less exposure to crafting the research questions and designing the research project. There was also some impact on the knowledge produced with those who worked individually able to undertake more creative and unusual projects, and those who studied part-time in supportive workplaces able to undertake the most ambitious projects.

The stronger links are between the models and pedagogies and the PhD experience. But even here the links are not direct. The experience of doctoral study is improved by contexts which are congruent with the PhD and for example, the network pattern with its greater opportunities for engagement, is more congruent than the individualist pattern. However, some people are content with (or able to survive) individualist patterns of supervision because they have other contexts which provide many of the elements which contribute to a positive experience. This explains why attempts to create postgraduate research communities and facilitate greater engagement sometimes fail – the PhD people have alternative congruent contexts which may be disrupted by greater participation in the academic contexts.

9.3 Interesting surprises which emerged

This research did more than address the research questions. There were aspects of doctoral education which it illuminated, which were not anticipated in the research design. The emergence of these insights points to the difficulty of setting up research questions before undertaking a study and the lack of linearity in the research process. This section reflects

on some of the interesting perspectives on doctoral education which came to light along the way.

The PhD continues to evolve

Looking back at the history of the PhD reminds one that the PhD is not an immutable thing. It evolved over time from a teaching qualification, to a research qualification and the exact nature of the degree has always been a matter of debate. The Doctor of Philosophy originated in the lower faculty of philosophy, a poor relation of the professional faculties of law, medicine and theology. With the rise of science and the expansion of the faculty of philosophy into the range of disciplines that today comprise faculties of science, humanities and arts, the doctor of philosophy came to be more highly regarded than the doctorates offered by the professional faculties. And as doing research became an essential part of scholarship during the late 1800s and early 1900s, the PhD became characterised by knowledge generation. Across the globe there have been experiments with the format of the PhD and in countries other than South Africa we have seen a proliferation of new forms of doctoral degrees.

Doctoral education in South Africa appears far more fixed, with the focus on generating knowledge and the individual supervision model having been firmly entrenched since its introduction. There have been experiments with different formats of doctoral education, but these remain exceptions and there is resistance to the introduction of other doctoral degrees and to changing the PhD. However, closer scrutiny reveals that the "overarching model" of individual supervision is actually quite varied with individual supervisors adopting a range of practices, and different patterns of research and support for doctoral people developing. Individual supervisors introduce new activities and ways of working with their supervisees and to a lesser extent there are co-ordinated efforts at the level of the academic unit to formalize doctoral education, to introduce more specialised roles in doctoral education and to involve more people in the work of supervising each PhD person.

Change in doctoral education, whether in the nineteenth century German neo-humanist reforms (McClelland 1980) or twenty-first century American calls to cultivate "stewards of the discipline" (Golde & Walker 2006), has been driven by high ideals about the nature of scholarship and the generation of knowledge, but it has also been driven by more prosaic

concerns to attract students, fund higher education and meet the needs of society for skills. These concerns are all evident in South African doctoral education.

You will recall from chapter two that there were three positions held in the public debates about the reforms of higher education in Germany in the late 1800s: the conservative focus on "right belief" and traditional pedagogies, the utilitarian focus on training for professions and administrative jobs, and the neo-humanist desire to "unfold and realize the full potential" of people (McClelland 1980:106). The neo-humanist emphasis on personal development formed the basis of university reforms out of which grew the notion of scholarship which underpins doctoral education today. These three views are echoed in the views of the PhD identified in this study, but things have changed. The utilitarian focus can still be seen in the labour market view, although there are new discourses to support it. The scholarly view now appears the most conservative, supporting ideals of masculine rationality that might well have looked modern in the nineteenth century. But the humanist notions of personal development now support the ongoing development perspective and the cause of equity and social justice. Although the debates recur, they do so in slightly different guises and the Doctor of Philosophy continues to change and evolve.

Supervisors are reluctant superheroes

One person who was supervising their first PhD[1] and knew that I had interviewed their student, asked after the interview whether she was happy with their supervision.[2] It was at that point that it dawned on me that supervisors could feel insecure in the role. Despite being familiar with the literature, my student perspective had until then prevented me from fully appreciating this, and I began to observe other supervisors who were hesitant or apologetic about their practice. One man ended up supervising despite not wanting to "because I didn't feel ready" after the co-supervisor "turned out to be useless."[3] Others said that their experience was limited[4] and asked me to refer them to resources on supervision.[5]

Then I sat in a conference listening to Anne Lee enumerate the activities involved in supervision[6] and the image of a superhero began to form in my head. A supervisor requires

1 CMI15:15
2 CMI15:422
3 CMI09:12
4 CMI09:16; CMI10:7; CMI15:15; CMI19:7; WCI09:43
5 KEI13:269
6 (Lee 2008)

skills in directing and project management, in diagnosing deficiencies and coaching, argument and analysis, facilitation and reflection and emotional intelligence (Lee 2008). Supervisors are expected to be experts in their subject,[1] to stay abreast of developments and to be contributing productively to the field.[2] They should introduce their supervisees to the research community, engage them in academic discussion, facilitate national and international research networks and arrange attendance at conferences (Christiansen & Slammert 2005:1053). They should expect "to spend many hours" with their supervisees, help them to access support structures, raise funds for their research projects, and read theses at inconvenient times (Charlesworth et al. 2007:4-5). They are also expected to play a pastoral role (Mouton 2001:20).

One supervisor says "doctoral [supervision] is like... almost getting married to the person. You've got to live their lives."[3] And new supervisors at Wits are advised that supervision "often requires attention and energy outside of normal working hours" and encouraged not to take on doctoral people if they can't "devote the necessary attention" (Charlesworth et al. 2007:4-5). The literature on good supervision gives the distinct impression that supervisors need to be superheroes. Which makes it reasonable that they should feel hesitant to take on such an ill-defined, yet demanding task with very little preparation and very low odds of success.

The idea that supervisors are heroic is reinforced by the institutions. The University of the Witwatersrand's publication *Strategies for Successful Supervision*, includes in its inside front cover the story of "The Rabbit's Thesis." The story concerns a happy little bunny who undertakes a research degree protected by a supervisor who turns out to be a lion. The story concludes with the moral: "The title of your thesis doesn't matter. The subject doesn't matter. The research doesn't matter. All that matters is who your supervisor is." (Charlesworth et al. 2007).[4] The intention in including the story might well be ironic, but it creates discomfort, both because of how it positions the PhD person and belittles their research, and for the way in which it positions the supervisor. Supervisors, particularly those new to supervision, might well struggle to see themselves in the role of lion.

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1 CMI06:139; CMI10:167; CMI19:79; CMI20:31; CMI21:51; CMI22:103; WCI01:77; WCI06:115; WPI04:169; WPI05:69; WPI15:53

2 See discussion in chapter six.

3 KEI08:43

4 The complete story is reproduced in Appendix E.

The widespread use of individualised supervision, together with increasing numbers of postgraduate students, place excessive burdens on supervisors and the superhero discourse which surrounds supervision adds to this. But I observed two potential ways in which this discourse might be balanced. Firstly, as I observed in chapter seven, PhD people are more realistic about what they can expect of their supervisors. And secondly the increasing involvement of a wider range of people in supervision, including co-supervisors and other specialists, may serve to reduce the expectations of each supervisor to a more realistic level.

The PhD is increasingly interdisciplinary

The Doctor of Philosophy in South African universities is usually awarded by the institution, rather than by individual faculties,[1] with the implication that it is a university degree that is similar, no matter which faculty one studies in. What struck me in this study was the degree to which the PhD varied across disciplines and specialisms, both in terms of the knowledge which was produced and in terms of the practice of doctoral education. The process of completing a doctorate varies from pure mathematicians who cannot produce a meaningful proposal because they do not know what they are going to do until they have done it, to research in the humanities in which a lengthy proposal, exploring epistemological assumptions and theoretical frameworks, is produced before research can commence. Theses have styles and formats that are specific to the discipline or specialism and the knowledge produced ranges from theorems, theories and philosophical musings; through mathematical models, modelling techniques and computer software; critiques of literary works and commentary on culture; to solutions to engineering and social problems, implementation protocols and design guidelines.

Few people realise just how different the PhD looks in disciplines other than their own and in the course of my research I was repeatedly met with expressions of incredulity when I described how practices and expectations differ across disciplines. For example, in many parts of the social sciences there are those that hold very firm views that the PhD thesis cannot include recommendations for practice. And yet in civil and environmental engineering, no thesis omits these. And many believe that a well-crafted conclusion is critical to a thesis, but no self-respecting pure mathematician will write one; the results must speak for themselves. I have had the experience of submitting a one-page proposal

[1] For example in all four case studies, the doctorate is approved by a university higher degrees committee rather than the faculty higher degrees committee.

written in a week for a PhD in mathematics, and submitting a 58-page proposal, written over six months for a PhD in education.

As a result, the institutional rules for doctorates are often inappropriate for the nature of knowledge production in the individual disciplines. In a workshop on supervision a senior member of the university, when told by a supervisor from architecture that examiners of doctorates in architecture meet to hear PhD candidates present their work, responded indignantly, "No they do not!" University rules stipulate that examiners must assess work independently, and that candidates may not know their examiners, but this does not take account of the need for architects to present and explain their designs verbally and with reference to delicate and hard-to-transport models. These differences make it difficult to implement institution-wide initiatives to support doctoral education or improve supervision.

Strongly-delineated disciplines only emerged during the twentieth century. At the time of the reforms to the German universities in the early 1900s, "[t]he idea that differing disciplines should have different methods and reigning assumptions was foreign" (McClelland 1980:125). As disciplines within the original umbrella of "philosophy" diversified during the twentieth century,[1] the singular Doctor of Philosophy has stretched to accommodate a growing number of different research traditions and approaches to knowledge generation. This study indicates that the boundaries between disciplines are becoming blurred and doctoral research increasingly crosses disciplinary boundaries. As Golde (2006:4) has noted, "Every discipline is evolving, with its boundaries expanding and changing. … The challenge for doctoral education is to help students be flexible and interdisciplinary." The other challenge is to ensure that the PhD itself is able to be flexible when it is required to cater for different disciplines, and for multiple disciplines when necessary.

9.4 Reflecting on this study

The contribution to knowledge

This study makes a number of contributions both empirical and theoretical to the research into doctoral education. As was mentioned in chapter one, Pearson has called for research in doctoral education to "include more complementary macro- and micro-level studies,

[1] The faculty of philosophy achieved equivalent status with the higher faculties around the beginning of the nineteenth century (McClelland 1980:110).

more critical analysis grounded in empirical data, more fine-grained analysis of local activity and human agency, and more recognition of the broad range of stakeholder interests" (Pearson 2005:130). As one of few qualitative studies of doctoral programmes in South Africa, this research makes such a contribution. It includes detailed descriptions and analyses of the practices and procedures surrounding doctoral education as well as rich evidence of what supervisors and doctoral people hope for, experience and do in doctoral education. This study is the first to compare doctoral education in South Africa across academic units, making it possible to identify common elements across disciplines and institutions and to highlight differences. The study draws on the views of both supervisors and doctoral people, giving voice to those with significant investment in and most intimately concerned with doctoral education.

At a conceptual level I identify the competing discourses about what a PhD is and how they result in different expectations of the PhD and of the PhD person. These expectations delimit who is eligible for doctoral study and prescribe the kind of person that results. While research into doctoral education in other parts of the world focuses on developing young scholars or people setting out on their careers, this study shows that this focus is not appropriate for the South African context. Most people who undertake doctorates in South Africa are older and established in their careers, and those careers are varied, including work within and outside of academia. I proposed a model of intersecting contexts of doctoral education which better reflects this reality than current models in use elsewhere. The intersecting contexts model provides a way to understand the expectations and circumstances of doctoral people and the notion of congruence illuminates their varied experiences.

This study confirms that PhDs in South Africa continue to be achieved by doing individual research under the guidance of a supervisor, but it identified four variants on traditional one-on-one supervision. I also identified elements of the practice of doctoral education, and argued that the pedagogy of doctoral education can be conceived of as a pedagogic network which the PhD person is embedded in and (ideally) is in control of. Finally it reveals that contrary to common perceptions of the PhD, the knowledge which is generated both crosses disciplinary boundaries and is driven by local agendas.

Limitations and further investigation

As was discussed in chapter three, this study examines only a small subset of doctoral education in South Africa. I looked at academic units which were producing a steady supply of graduates and were based at traditionally English-speaking, historically advantaged universities. These four cases by no means reflect the full range of doctoral programmes and it would not be appropriate to generalize from these results. But the study does raise questions for further study. Most obviously it would be useful to replicate the study at institutions from the traditionally Afrikaans-speaking institutions where there are differences in the practice of doctoral education and at the historically disadvantaged institutions and the new universities of technology which have less entrenched research cultures.

I also found that the research design sat uncomfortably between a survey and an in-depth ethnography. While the interviews provided considerably more insight than a survey would have done, I felt that at times they were only scratching the surface of the doctoral experience. The interviews did not reflect my own experiences of insecurity, confusion, anger, boredom, and frustration, although I did detect these in private conversations with many of the people I interviewed. It is possible that the interviews were eliciting "thin stories" as Lee and Williams call them, "brief, unconflicted, unproblematic accounts of doing the PhD" (1999:11). A more complete ethnographic account of the experience of doctoral study might be able to elicit more complete accounts.

One of the things that this study was not able to do was to reflect on the demand for doctoral graduates. Indications are that in Africa, "only a very few fields such as agriculture and economics" show "strong labour market demand for people with PhDs." In fact, "most government agencies, NGOs, and private firms in Africa seem content with hiring (and internally training, if need be), Bachelors or Masters level graduates" (Szanton & Manyika 2002:21). My most grandiose plans included an investigation into who employed people with PhDs and why, but that part of the study could not be completed due to time constraints. I am aware of at least one study done into the career paths of doctoral graduates in South Africa (Kahn et al. 2004), but there is a need for better understanding in this area. Investigating what kinds of employment doctoral graduates take up, which organisations employ them, and what it is about doctoral graduates that those organisations value, would be a useful contribution.

Confessions of a PhD person

> *Lived experience, as it unfolds in consciousness, is a constant process of correction. Not correction in the sense of right and wrong or trying to record the true picture but correction in the sense of adjusting the picture based on the perceived change in the relationships between the performers in a setting. Every stimulus attended to is a line of information added in the drawing process; each pass of the recording medium is a new layer that changes how the prior layers will contribute to an overall perception of the picture. As new impressions are received, new pictures emerge. (Ronai 2002:107)*

My understanding of the doctorate and the process of doctoral education evolved over the last three years, not only as a result of what I was studying, but also as a result of my own experience. From my initial exhilaration at the prospect of interrupting my employment to be a student again, to my alarm and confusion at being silenced by a discourse to which I had no access, through the slow process of learning to speak again and rebuilding my confidence, my experience of doctoral education has been closely tied to who I am, my own sense of agency and the story that I was constructing of my doctorate.

Throughout the research I have asked myself: Does the autoethnographic thread contribute to the study? Do these self-reflections perhaps put me at risk by revealing my biases, do they jeopardize the objectivity of the research? Or are they necessary, given that to conceal them might itself put the rigour of the research in question?

Undoubtedly my being a PhD person while completing this research has influenced the outcomes. My construction of the career nomad, my conception of the intersecting contexts and the notion of congruence between the subjectivities of the PhD person and the contexts were informed by my own experience. I noticed in presenting parts of this work that supervisors are quicker to defend McAlpine and Norton's nested contexts model of doctoral education, while PhD people quickly identify with the intersecting contexts model. As a doctoral person said to me after a presentation at a conference on doctoral education, "this is the first time during this conference that I have been able to recognise myself in the research." It is doubtful that I would have come up with these constructs had I not been this PhD person at the time.

I have a confession to make. I undertook this PhD for the worst of reasons – to improve my employment prospects. I was working in higher education and wanting to work in higher education management. The PhD is necessary for my career. I smiled politely when

one of the supervisors said "I don't believe a thesis could be written out of cynicism. Do you?"[1] Now I can answer her: "Yes, it is possible. Here is the proof." I have had to be secretive about this motive for the duration of my PhD, and as I write this I wonder if I ought to continue that subterfuge until I have graduated. Will this revelation confirm to my examiners that I am not a real scholar? Will they close ranks to keep this heretical thought from seeing the light of day?

9.5 Last words

In the course of doing this research I have often been asked to comment on what might be good practice, what models of doctoral education ought to be in use, and how doctoral education could be improved in terms of increasing access, making the experience less arduous or ensuring more people complete. While three years ago I would have been quick to respond and emphatic in my views, the curse of academic knowledge is that greater complexity and subtlety is revealed making it more difficult to answer these questions. As other South African researchers have observed, "research learning is even more complex than we had anticipated, and that making firm statements about 'the right way' to prepare doctoral students might in fact be the first error in seeking to improve the learning and support of novice researchers" (Jansen et al. 2004:99).

Instead let me address the question in a suitably oblique manner, asking: What are my hopes for doctoral education in South Africa? I hope for ongoing, vigorous, but respectful public debate about the nature and purpose of the PhD. I hope that my identifying and articulating the different discourses contributes to those conversations. I hope that the voices of supervisors, who embody great accumulated wisdom about these matters, will become stronger. I hope for ongoing experimentation with new forms of doctoral education and new pedagogies. I hope for greater communication between disciplines and willingness to learn from each other. I hope for greater recognition of the varied motives and circumstances of doctoral people and recognition that there is value in getting a PhD later in life even though such a person might have a shorter research career. I hope that more and more people in South Africa and Africa will consider themselves ready to take up the challenge of doctoral studies and that they will do so with a strong sense of their own importance and agency in the doctoral process. I hope that a greater variety of study, funding and work structures will become available to facilitate greater access to doctoral

[1] KEI01:45

study. And I hope that these structures can be organised to allow people to tackle big questions and undertake ambitious projects.

Appendix A

DATA COLLECTED

This appendix lists the data collected during the study and indicates how each is referenced in the text. Details have been omitted that might compromise confidentiality.

CASE STUDY 1: Civil and Environmental Engineering, Wits

Documents

WCD01	Introduction to the School of Civil and Environmental Engineering
WCD02	Call for PhD and Masters students in computational engineering
WCD03	Faculty of Engineering: Information for guidance of examiners of theses for the Doctor of Philosophy
WCD04	Faculty of EBE: Supervisor duties
WCD05	PhD proposal – WCI01
WCD06	'Putting together research proposals' – correspondence, WCI01
WCD07	Format for PhD proposals, Faculty of EBE
WCD08	Supervisor duties, Faculty of EBE
WCD09	Statement of principles for postgraduate supervision
WCD10	Paper – WCI07
WCD11	PhD proposal – WCI07
WCD12	PhD proposal – WCI06
WCD13	PhD proposal – WCI04
WCD14	PhD Chapter 1 intro – WCI02
WCD15	PhD Chapter 2 question – WCI02
WCD16	PhD Chapter 3 focus – WCI02
WCD17	PhD Draft Nov 2003 – WCI02
WCD18	Notes on PhD's awarded in the department 2000 – 2005
WCD19	PhD proposal – WCI10

Interviews

WCI01	January 15, 2007	PhD person
WCI02	January 15, 2007	PhD person
WCI03	January 20, 2007	PhD person
WCI04	January 23, 2007	PhD person
WCI05	January 31, 2007	Supervisor / Staff
WCI06	February 20, 2007	PhD person
WCI07	February 20, 2007	PhD person
WCI08	February 27, 2007	Supervisor / Staff
WCI09	March 7, 2007	Supervisor / Staff
WCI10	June 4, 2007	PhD person

Conversations

WCC01	December 14, 2006	Administrator

CASE STUDY 2: Mathematics and Applied Mathematics, UCT

Documents

CMD01	Department strategic plan 2000-2004
CMD02	Faculty of Science MOU between graduate student and supervisor
CMD03	Review of theses in Mathematics and Applied Mathematics
CMD04	Department visitor's guide
CMD05	Pamphlet, teaching with technology grants
CMD06	PhD's awarded in 2006
CMD07	Postgraduate pages: Finances
CMD08	Postgraduate pages: Research areas
CMD09	Postgraduate pages: Doctoral information
CMD10	Notes on PhD's awarded in the department 2000 - 2005
CMD11	CERECAM research centre web site
CMD12	UCT PhD programme in economics

Interviews

CMI01	April 17, 2007	PhD person
CMI02	April 17, 2007	PhD person
CMI03	April 19, 2007	Supervisor / Staff
CMI04	April 19, 2007	PhD person
CMI05	April 20, 2007	PhD person
CMI06	April 20, 2007	PhD person
CMI07	April 20, 2007	PhD person
CMI08	April 20, 2007	PhD person
CMI09	April 23, 2007	Supervisor / Staff
CMI10	April 23, 2007	Supervisor / Staff
CMI11	April 23, 2007	PhD person
CMI12	April 23, 2007	Supervisor / Staff
CMI13	April 23, 2007	PhD person
CMI14	April 26, 2007	PhD person
CMI15	April 30, 2007	Supervisor / Staff
CMI16	April 30, 2007	PhD person
CMI17	May 2, 2007	Supervisor / Staff
CMI18	May 2, 2007	Supervisor / Staff
CMI19	May 3, 2007	Supervisor / Staff
CMI20	May 3, 2007	Supervisor / Staff
CMI21	May 4, 2007	PhD person
CMI22	May 4, 2007	Supervisor / Staff
CMI23	May 4, 2007	Supervisor / Staff

Conversations

CMC01	April 18, 2007	publishing papers
CMC02	April 19, 2007	supervision
CMC03	April 19, 2007	knowledge
CMC04	April 26, 2007	being a PhD student
CMC05	April 19, 2007	black students

Observations

CMO01	April 19, 2007	Postgraduate party

CASE STUDY 3: Public and Development Management, Wits

Documents

WPD01	Advertisement for short course in HE management
WPD02	P&DM 10 Years of Leadership through learning in Africa's Leading School of Governance
WPD03	Handbook for P&DM Research Degrees
WPD04	Letter to students: Preparation for Research Degrees
WPD05	Brochure: Certificated short course programme in Higher Education Management
WPD06	Welcome to P&DM – message from the Head of School
WPD07	e-mail criticising the PhD social theory course
WPD08	CLM inter-faculty preparation for PhD PADM 5123 2007
WPD09	Techniques for doing: Research 1
WPD10	Paper: Mitev, Constructivist and critical approaches to an IS failure case study
WPD11	CLM inter-faculty preparation for PhD PADM 5122 2007 – second quarter
WPD12	Notes: Marxism
WPD13	Notes: Feminist Qualitative Research
WPD14	Notes: The self / The state
WPD15	Notes: Discourse Analysis
WPD16	Notes: Literature reviews
WPD17	Paper: Tierney, WG (2001) The autonomy of knowledge and the decline of the subject. *Higher Education* 41:353-372.
WPD18	Paper: Basset, TJ & Porter, PW (1991) From the Best Authorities: The Mountains of Kong. *The Journal of African History* 32(3):367-413.
WPD19	Book chapter: Introna, L & Whittaker, L (2004) Truth, journals and politics: the case of the MIS Quarterly. In Kaplan B, Truex DP, Wastell D, Wood-Harper AT, De Gross JI (Eds.) *Information Systems Research*, Kluwer, Boston.
WPD20	Notes: The proposal
WPD21	Stuart Watt, Writing a PhD proposal
WPD22	Literature review checklist
WPD23	P&DM Quinquennial Review: Report of the Review Committee
WPD24	Notes on PhD's awarded in the department 2000 – 2005
WPD25	PhD short proposal – WPI06

Interviews

WPI01	July 02, 2007	PhD person
WPI02	July 04, 2007	PhD person
WPI03	July 13, 2007	PhD person
WPI04	July 17, 2007	Supervisor / Staff
WPI05	July 17, 2007	Supervisor / Staff
WPI06	July 18, 2007	PhD person
WPI07	July 18, 2007	PhD person
WPI08	July 20, 2007	PhD person
WPI09	July 24, 2007	Supervisor / Staff
WPI10	July 25, 2007	PhD person
WPI11	July 26, 2007	PhD person
WPI12	August 03, 2007	PhD person
WPI13	August 14, 2007	PhD person
WPI14	August 14, 2007	Supervisor / Staff

WPI15	August 16, 2007	PhD person

Conversations

WPC01	February 22, 2007	the P&DM PhD program
WPC02	March 09, 2007	using P&DM as a case study
WPC03	March 12, 2007	criticism of the PhD program
WPC04	July 17, 2007	the DBA at GIBS

Observations

WPO01	May 08, 2007	Social theory course
WPO02	May 08, 2007	Social theory course
WPO03	July 02, 2007	Social theory course
WPO04	July 03, 2007	Social theory course
WPO05	July 25, 2007	P&DM 'conversation'

CASE STUDY 4: English Studies, UKZN

Documents

KED01	PhD Degree Research Proposal, Faculty of Humanities, development and social sciences
KED02	Ethical clearance application form (human and social sciences)
KED03	Information for the guidance of examiners for the degree of doctor of philosophy
KED04	Contract between supervisor and candidate, Faculty of Humanities, Development and Social Sciences, UKZN
KED05	Programme of English studies, Welcome
KED06	Programme of English studies, Postgraduate Studies, Introduction
KED07	Brochure: School of Literary Studies, Media and Creative Arts
KED08	Brochure: English Studies
KED09	Brochure: Postgraduate Study in English
KED10	Ukzndaba, Vol 4, no. 4, April 2007
KED11	Student Handbook, English Studies UKZN
KED12	Short learning programs – School of Business and Technology (Varsity College)
KED13	Full-time degrees, Diplomas and Certificates 2007/2008 (Varsity College)
KED14	Proposal – KEI12
KED15	NRF Institutional Capacity Development Grants, Conditions for the award of grantholder-linked student support categories for 2006.
KED16	Department telephone list
KED17	Notes on PhD's awarded in the department 2000 – 2005
KED18	Handbook for 2007, Faculty of Humanities, Development and Social Sciences, University of KwaZulu-Natal

Interviews

KEI01	October 29, 2007	Supervisor / Staff
KEI02	October 30, 2007	Supervisor / Staff
KEI03	October 30, 2007	PhD person
KEI04	October 30, 2007	PhD person
KEI05	October 31, 2007	Supervisor / Staff

KEI06	October 31, 2007	PhD person
KEI07	October 31, 2007	PhD person
KEI08	November 01, 2007	Supervisor / Staff
KEI09	November 01, 2007	Supervisor / Staff
KEI10	November 01, 2007	Supervisor / Staff
KEI11	November 02, 2007	PhD person
KEI12	November 05, 2007	PhD person
KEI13	November 05, 2007	Supervisor / Staff

Conversations

KEC01	October 31, 2007	funding for students, academic life
KEC02	November 5, 2007	reading culture, cross-disciplinary work
KEC03	November 6, 2007	funding for students
KEC04	November 6, 2007	funding for students
KEC05	October 30, 2007	participating, student difficulties

Observations

KEO01	October 29, 2007	Research seminar

PILOT STUDY: School of Education, Wits

Documents

WED01	Supervision, Guidelines on supervision of research reports and theses
WED02	Applying for a PhD Degree, (http://www.wits.ac.za/education/phdmainsteps.html accessed 16 August 2006)
WED03	Areas of expertise in the supervision of PhD research, (http://www.wits.ac.za/education/phdexpertise.html accessed 16 August 2006)
WED04	Report on the 2nd, 3rd and 4th retreats for Deans / Directors participating in the Spencer Foundation's research training grant program
WED05	Some salient points from enclosed questionnaire responses, Core courses for fledgling educational researchers. Spencer Research Training Grant Conference March 15-16, 2001, University of California, Los Angeles.
WED06	Research training grant pre-conference questionnaire, responses UCT
WED07	Research training grant pre-conference questionnaire
WED08	Summary of key points, Young Scholars Retreat, 29th April 2004
WED09	Research training grant pre-conference questionnaire, responses Wits
WED10	Division of Education Leadership and Policy Studies, invitation to public lectures, Mail & Guardian, July 2006
WED11	Division of Education Leadership and Policy Studies, invitation to apply for programmes in the division, Mail & Guardian, July 2006
WED12	Preparing your research proposal (http://www.wits.ac.za/humanities/education/phdproposal accessed 2 January 2007.)
WED13	Guidelines on supervision of PhD theses (http://www.wits.ac.za/humanities/education/phdsupervision accessed 2 January 2007.)
WED14	e-mail notification of meeting with PhD students 29 Jan 2008

Interviews

WEI01	October 24, 2006	Supervisor
WEI02	October 25, 2006	Student
WEI03	November 23, 2006	Student

Conversations

WEC01	May 10, 2006	international students
WEC02	October 13, 2006	literature review and EndNote
WEC03	November 13, 2006	making progress
WEC04	November 13, 2006	planning and progress
WEC05	November 14, 2006	isolation and involvement
WEC06	November 16, 2006	writing and learning
WEC07	November 21, 2006	typology of supervision
WEC08	November 22, 2006	structure of the thesis
WEC09	January 04, 2007	supervisor differences

Observations

WEO01	September 13, 2006	Doctoral seminar, Wits school of Education
WEO02	September 16, 2006	Applied English Language Studies, postgraduate forum
WEO03	September 18, 2006	Doctoral seminar with Martin Carnoy

OTHER: Data that applies across Wits case studies

Documents

WGD01	Strategies for Successful Postgraduate Supervision
WGD02	Workshops for supervisors
WGD03	Call for papers, International Journal of Doctoral Studies
WGD04	Basic research skills and competencies for beginning researchers
WGD05	Invitation to review NRF rating system
WGD06	University of Art and Design, Helsinki, Publications 2007
WGD07	e-mail from PhD student in Ghana about innovation in research work
WGD08	Programme for Postgraduate Job Search workshop

Observations

WGO01	February 28, 2007	Supervision workshop, Centre for Learning and Teaching Development
WGO02	March 22, 2007	"Specters and Expectations" workshop on problems and solutions of supervision
WGO03	October 25, 2007	Writing workshop, The Writing Centre, Wartenweiler Library
WGO04	October 25, 2007	Supervision workshop on transference, Centre for Learning and Teaching Development
WGO05	October 9, 2007	Workshop: constructing a scholarly identity
WGO06	August 24, 2007	Workshop: peer writing

Appendix B

INTERVIEW PROTOCOLS

Student interview

The cultural interview is about listening in order to understand the viewpoint and meanings of the person being interviewed. Here it is used to understand the culture of each doctoral program, the learning experience of students and to explore student learning. Goals are to uncover the meaning that students attach to the different elements of the program, the processes involved, the interactions and the achievement of the doctorate.

1. About yourself

Tell me about how you got to be here, doing this PhD.
(Probe: Why do you want to do a PhD? Why this one? What is your career history?)

How does this doctorate relate to your work or career?
(Probe: Is it related? Will it benefit your career? How? Does your career benefit your studies? What do you plan to do after this?)

2. Views on doctoral studies

What do you think makes a doctorate different from any other degree?
(Probe: What is a PhD for? What is the purpose of a PhD? What do you think you learn in a PhD that you don't in any other degree?)

What makes one doctoral program of better quality than another?
(Probe: What about taught courses and the American model? What about professional doctorates? How will you know if what you are producing is good?)

Can you think of a metaphor for doing a doctorate? (Doing a doctorate is like…)

3. Structure of the program

Describe the process of getting a PhD. What are the stages you go through?
(Probe: How would you explain the process to someone else? How long does each stage last? What marks the transition to the next stage? Which parts are most problematic or challenging?)

4. Pedagogies

Tell me about your supervisor and your relationship with your supervisor.
(Probe: What do you expect from your supervisor? Are those expectations met? What is the relationship like? How do you interact? What do you learn from her/him?)

Can you think of a metaphor for being supervised? (Being supervised is like…)

How effective are the courses you attend in facilitating learning?
(Probe: Who runs them? Are you 'being taught' or 'constructing knowledge'? What is your role in the process? How are courses assessed?)

Is learning different at PhD level from learning in (say) an undergraduate degree?
(Probe: What is different? Should it be different? Why? What role does 'teaching' play at this level? What activities (or pedagogies) promote learning?)

5. Learning and knowledge

What have you learned from your PhD studies so far?
(Probe: What have you learned about academia; about this discipline; about your profession? What skills have you learned or improved on? What have you learned about social interactions?)

A doctorate is supposed to "contribute to the body of knowledge". Do you feel that you are contributing to the body of knowledge?
(Probe: What will you contribute to the body of knowledge? What is knowledge? Who decides what is worth knowing? How did you choose your thesis topic? Have your views of knowledge changed during your studies?)

6. Your experiences of studying

How do you feel about your doctoral studies?
(Probe: Are you enjoying it? Hating it? Why? Is that just how you feel today or in general over the time that you have been working on it?)

What are the biggest challenges you face in your PhD studies?
(Probe: What is most difficult? Why? What support do you get and from whom? Who do you talk to?)

What are you enjoying the most or finding most satisfying about your PhD studies?
(Probe: Why is this aspect enjoyable? Why do you find it easy / fun?)

7. Environment

Tell me about your relationships with the other students on this program.
(Probe: Who to you talk to about your studies? How many of your fellow students do you interact with and how often? Do your fellow students contribute to your learning and, if so, in what ways? Do you socialize with them?)

How do you interact with the academic staff on this program?
(Probe: How often do you see them? Do you know what research your supervisor / other members of academic staff are involved with? What is the status of doctoral students – are you colleagues or students? Do you socialize with them?)

What is the environment like?
(Probe: Do you have the resources you need? What is the working space like? How hard is it to get things done? How hard is it to get information? Who helps you to find information and organise things?)

8. Anonymity

If I want to quote you in my report, would you prefer to have me use your name or would you prefer me to use a pseudonym? Would you like to choose your pseudonym?

Supervisor interview

The cultural interview is about listening in order to understand the viewpoint and meanings of the person being interviewed. Here it is used to understand the culture of each doctoral program, the learning experience of students and to explore student learning. Goals are to uncover the meaning that academic staff attach to the different elements of the program, the processes involved, the interactions and the achievement of the doctorate.

1. About yourself

Tell me about how you got to be here, teaching on this PhD program at this institution.
(Probe: What is your career history? What is your involvement in PhD programs? Can I get a copy of your CV or is there a profile on the university web site?)

Tell me about careers in your discipline.
(Probe: What does it take to succeed? What are the 'rules of the game' for a successful career in this discipline? Where do your PhD graduates end up? Are there careers outside of academia for your PhD graduates?)

2. Views on doctoral studies

The PhD has been described as a 'rite of passage' to academic life. Does this reflect the situation in your discipline?
(Probe: How important is a doctorate in this discipline? Are those with doctorates different? Are they treated differently? Can you make it without a doctorate?)

Can you think of a metaphor for doing a doctorate? (Doing a doctorate is like…)

What do you think makes a doctorate different from any other degree?
(Probe: What is a PhD for? What is the purpose of a PhD? What do you think one learns in a PhD that one does not learn in any other degree?)

What makes one doctoral program of better quality than another?
(Probe: What about taught courses and the American model? What about professional doctorates? How do you know that your program is good?)

3. Structure of the program

Describe the process of getting a PhD. What are the stages the student goes through?
(Probe: How would you explain the process to someone else? How long does each stage last? What marks the transition to the next stage? Which parts are most problematic or challenging?)

4. Pedagogies

Tell me about your interactions with your PhD students.
(Probe: How many students are you currently supervising? How often do you meet them? Who initiates the meetings? How long do those meetings last? What do you discuss at the meeting? How do you give feedback to your students?)

Tell me about your relationships with your students.
(Probe: What do you expect from your students? What can your students expect from you? Are those expectations met? What is the relationship like? What is your role in your student's learning?)

Can you think of a metaphor for supervising doctoral students? (Supervising doctoral students is like…)

How effective are the courses presented here in facilitating learning?
(Probe: Who runs them? Are students 'being taught' or 'constructing knowledge'? What is your role in the process? How are courses assessed?)

Is learning different at PhD level from learning in (say) an undergraduate degree?
(Probe: What is different? Should it be different? Why? What role does 'teaching' play at this level? What activities (or pedagogies) promote learning?)

5. Learning and knowledge

What do (or should) students learn during their PhD studies?
(Probe: What do they learn about academia; about this discipline; about your profession? What skills do they learn or improve on? What do they learn about social interactions?)

A doctorate is supposed to "contribute to the body of knowledge". Tell me about conceptions of knowledge in your discipline.
(Probe: What counts as knowledge? Who decides? How are thesis topics selected? What makes a good thesis topic? What approaches are appropriate for exploring knowledge in this discipline?)

6. Your experiences of studying

Tell me about your own experience of getting a PhD?
(Probe: Where, when, what and how? Did you enjoy it? Hate it? Why? What were the biggest challenges you faced in your PhD studies? What did you enjoy the most or find most satisfying about your PhD studies?)

7. Environment

How do you interact with the students on this program?
(Probe: How often do you see them? Do they know what research you / other members of academic staff are involved with? What is the status of doctoral students – are they colleagues or students? Do you socialize with them?)

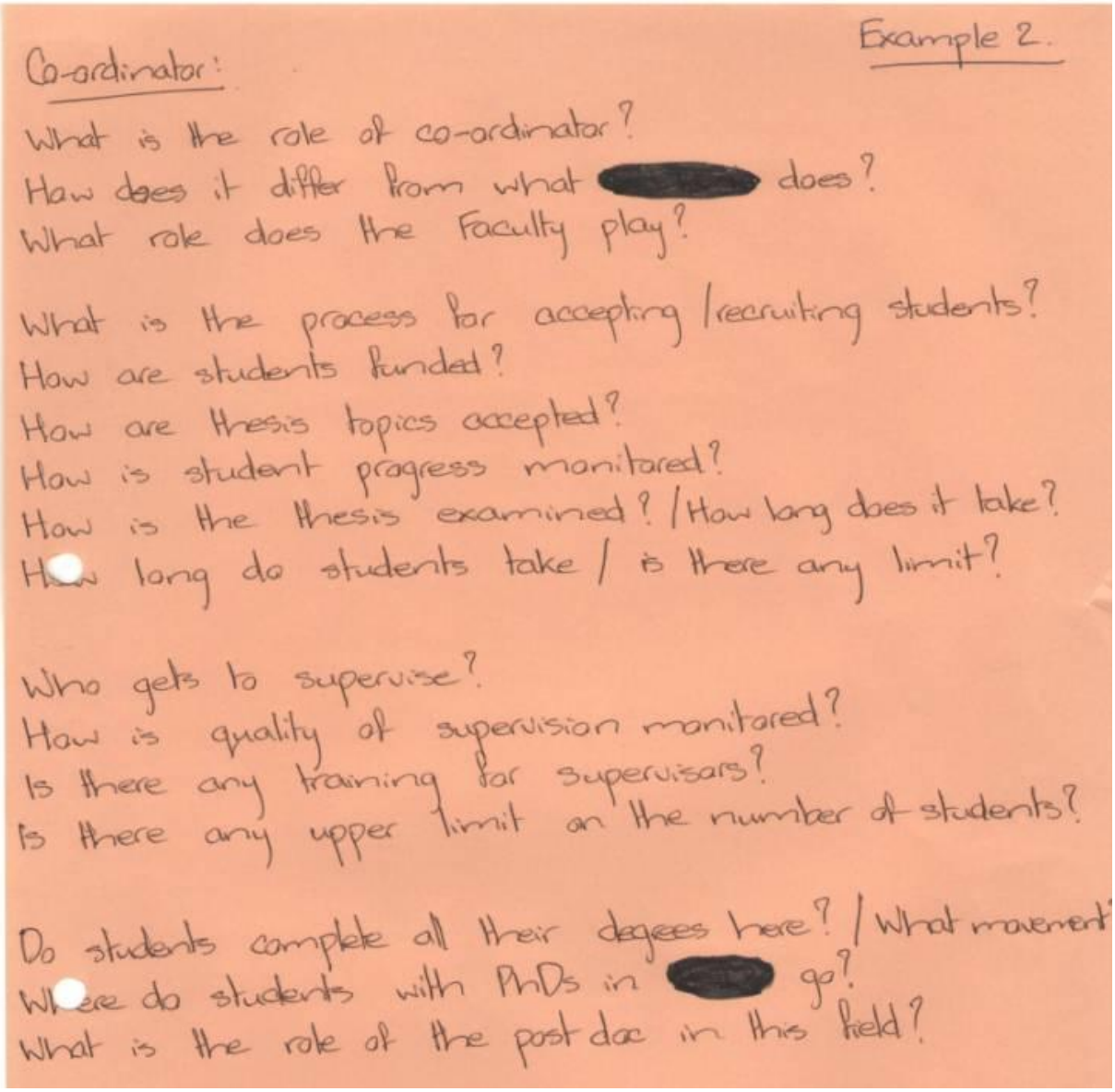
What is the environment like?
(Probe: Do you and your students have the resources you need? What are the working spaces like? How hard is it to get things done? How hard is it to get information? Who helps you to find information and organise things? Is this a good environment in which to work?)

8. Anonymity

If I want to quote you in my report, would you prefer to have me use your name or would you prefer me to use a pseudonym? Would you like to choose your pseudonym?

Interview questions for postgraduate coordinator

Following is a sample of questions compiled for a course coordinator asking more direct and factual questions about the processes surrounding the PhD.



Example 2.

Co-ordinator:

What is the role of co-ordinator?
How does it differ from what [redacted] does?
What role does the Faculty play?

What is the process for accepting/recruiting students?
How are students funded?
How are thesis topics accepted?
How is student progress monitored?
How is the thesis examined? / How long does it take?
How long do students take / is there any limit?

Who gets to supervise?
How is quality of supervision monitored?
Is there any training for supervisors?
Is there any upper limit on the number of students?

Do students complete all their degrees here? / What movement?
Where do students with PhDs in [redacted] go?
What is the role of the post doc in this field?

Appendix C

RESEARCH PROJECT COSTS

Research Project Direct Costs				**29,402.22**
Date	**Supplier**	**Description**	**Amount**	
General costs				
Feb 06		EndNote	1,592.00	
Aug 07	Cleverbridge	Atlas.ti	1,312.24	
June – Dec 07	Byron	Transcribing	8,650.00	
Feb – Dec 07	Andrew	Transcribing	2,850.00	
		Stapler for large documents	427.50	
	Makro	Printer cartridges	1,538.00	
	Makro	Printer paper	1,050.00	
	Various	Stationery	300.00	
Nov 08 / Jan 09		Editing	5,000.00	
				22,719.74
Case study 2: Maths and applied maths		*16 April to 6 May 2007*		
April / May 07	SA Airways	Flights	1,105.00	
April / May 07	RDB	Accommodation – CT	825.00	
April / May 07	Metrorail	Trains	198.00	
April / May 07	Various	Food	220.00	
April / May 07	Vodacom	Telephone	314.48	
				2,662.48
Case study 4: English Studies		*28 October to 8 November 2007*		
Oct / Nov 07	SAA	Flights (taxes, booking)	426.00	
Oct / Nov 07	Various	Taxis	465.00	
Oct / Nov 07	Acasa di Angelo	Accommodation	2,550.00	
Oct / Nov 07	Acasa di Angelo	Laundry	35.00	
Oct / Nov 07	Various	Food	241.00	
Oct / Nov 07	Vodacom	Internet	100.00	
Oct / Nov 07	Vodacom	Telephone	203.00	
				4,020.00

Appendix D

DOCTORAL THESES

Civil and Environmental Engineering

Candidate	Year	Title	Pages	Contribution to knowledge
Grobler, LJ	2004	Employment, empowerment and rural transport infrastructure with the focus on drainage structures for basic access.	408 excluding refs and appendices	"Previous studies showed labour-based methods to be a practical and viable option in the construction of rural roads... While this category of work is clearly not negligible, it has not received due consideration by academics or practitioners thus far." (from abstract p. iii)
Ilemobade, AA	2003	Decision support systems for rural and peri-urban water distribution system design and operation.	30 to 50 pages per chapter.	"This thesis presents a robust and generic decision support system for the design, analysis and operation of major components of small water distribution systems in rural, peri-urban and urban-poor communities" From abstract p. iii.
Jones, D	2001	Dust and dust control on unsealed roads	335 pages	From abstract: "Dust control is not practiced widely in South Africa... skepticism of road authorities and consulting engineers towards... chemical palliatives... A standard protocol for conducting research into CDPs has been formulated..."
Moola, S	2001	Organic degradation and population monitoring in simulated semi-arid municipal solid waste landfills co-disposed with sewage sludge.	282 excluding appendices	"It was concluded that in a semi-arid area, like the Highveld, co-disposal is beneficial to the degradation of complex material at the appropriate sewage sludge to waste ratio and only if early leachate detection and treatment mechanisms are in place" (from abstract). Concerned with the chemical composition of the waste...

Candidate	Year	Title	Pages	Contribution to knowledge
Morris, JWF	2001	Effects of waste composition on landfill processes under semi-arid climatic conditions.	720 excluding appendices. 2 volumes.	"To investigate the effects of waste composition on degradation processes... to further the affordability of waste disposal" (from abstract). Seeks to change the regulatory framework.
Randell, BN	2001	Modelling the conjunctive use of alternative water resources	151 pages	"Water shortage problems are not uncommon... computer software is developed that maximises the yield of a conjunctive use scheme... The model is applied to the... metropolitan area... SA... resources are limited... This thesis tries to optimize such combined systems..." (from abstract)
Rankine, RGD	2000	Proposed design and construction guidelines for labour-intensively built rubble masonry concrete structures with particular reference to arch bridges.	About 200 pages – each chapter about 20 pages, varies.	From abstract: "This thesis explores the mechanical properties and behaviour of RMC as well as physiological factors which govern the physical work capacity of the targeted labour force", the section headed Contribution to Knowledge on p iv ends with "... material specifications and design and construction guidelines for RMC arch bridge structures are formulated and proposed... "
Rohrs, LH	2002	The effects of sewage sludge and municipal solid waste (MSW) co-disposal on landfill emissions and degradation processes in water deficient environments.	chapters vary: 73, 144, 22 pages. Two volumes.	Predicts that "the outcome of codisposal can be predicted and manipulated" and concludes that "landfill processes can be manipulated through using sewage sludge and stabilization can be accelerated" and that this is "generally less polluting than if the waste were disposed separately" (from abstract, iv)
Van Ryneveld, MB	2002	Design of civil engineering facilities for developing communities, with particular reference to water supply and sanitation provision in the urban areas of South Africa.	426 pages	Looks at the environmental impact of alternative sanitation provision, which is cheaper than water-borne sanitation. Gives a method for evaluating cost of environmental impact. Applies it to Gauteng.

English Studies

Candidate	Year	Title	Pages	Contribution to knowledge
Wittenberg, H	2004	The Sublime, Imperialism and the African Landscape	242 pages	"Virtually no attention has been given to the colonial manifestations of the sublime. In this dissertation I have argued for a postcolonial reading of the sublime that..." (Abstract, p. iii)
Lombardozzi, LM	2007	Journeying beyond Embo: The construction of exile, place and identity in the writings of Lewis Nkosi	283 pages	Nkosi "has remained largely under-researched"
Sheik, A	2002	Wopko Jensma, a monograph: The interface between poetry and schizophrenia	315	"A comprehensive study of a major South African poet".... "uncovers... an hitherto unpublished and mostly unknown anthology...."
Akal, AVG	2003	Forms of community service: Guy Butler's literary contributions	323 pages	"I suggest a more inclusive re-evaluation of Butler as both artist and public figure serving an inclusive 'imagined community'"
Smith, NJ	1998	Theorizing discourses of Zimbabwe, 1860 – 1900: A Foucauldian analysis of colonial narratives	427 pages	"This study argues that different modes of knowledge about Africa, 'progress' and civilization were encoded in narratives of the mission, exploration, the chase and military science" p. 1-2
Naidoo, V	1998	Magic realism in Zakes Mda's 'Ways of Dying' (1995) and 'She plays with the darkness' (1995)	330 pages	"I shall argue in this thesis that.... investigates the extent.... a radical shift in literary representation by South African black writers who wrote in English"
Stobie, C	2005	Somewhere in the double rainbow: Representations of bisexuality in selected post-apartheid South African novels	422 pages	"Purpose of this study is to analyse,,, 16 novels exploring... bisexuality which appeared after 1994" p1

Candidate	Year	Title	Pages	Contribution to knowledge
Govinden, D	2000	"Sister outsiders" - the representation of identity and difference in selected writings by South African Indian women	418 pages	"The time has come for new challenges in gynocritical and discursive analyses of identity and difference, for a new critical consciousness, theorising and action, and for a new praxis that works on linkages and interdependencies in diverse ways"

Mathematics and Applied Mathematics

Candidate	Year	Title	Pages	Contribution to knowledge
Batubenge, T	2004	Sumplectic Frolicher spaces of constant dimension	121	"In this thesis we introduce the concept of dimension on Frolicher spaces. We define the concepts of Frolicher spaces of constant dimension, Frolicher spaces of class DS, pre-Frolicher spaces, pseudomanifolds and then present new results for the symplectic geometry in the constant dimensional case. Examples and applications to mechanics are provided." (from Abstract)
Betschart, G	2005	General relativistic electrodynamics with application in cosmology and astrophysics	159	"We apply general relativistic electrodynamics to the study of plasmas on curved spacetimes." "A new weakly damped plasma mode is identified..." "These perturbations are found to be governed by a covariant master equation, which generates the well-known Regge-Wheeler equation for Schwarzschild perturbations."
Chiang, YB	2001	Sorting networks using k-comparators	167	Proving algorithms. Constructing parallel sorting algorithms and goes on to solve "one particular problem in parallel connecting networks: the rearrangeability of the double butterfly networks of size N" (solves it for N<= 32).

Candidate	Year	Title	Pages	Contribution to knowledge
De Oliveira, J	2002	The development and implementation of a joint management procedure for the South African pilchard and anchovy resources	319	Investigating trade-offs in management of pilchard and anchovy stocks. Develops "a computer-simulation tested set of formulae used to recommend catch levels". Considers two models – one external where the minister determines the trade-off for the industry and one internal where the total quota is set, but the trade-off decided at the level of individual rights-holders. Investigates the potential for adding other variables to the model.
Goheer, N	2004	Topics in string cosmology	161	Two distinct topics (1) "Our main result is that the isotropic high energy BDL model is the generic past attractor in the state space of FLRW braneworld models." (2) the second focus... "we prove that the finiteness of the horizon entropy stands in contradiction with the symmetry group of de Sitter space" (quotes from abstract).
Hattingh, S	2002	The simulation of single phase, compressible fluid flow in fractured petroleum reservoirs using finite elements	193	Creates a 'finite element program' to 'model the flow of highly compressible gas through a fractured reservoir' (p. ii). Enumerates three ways in which "the approach described in this thesis is unique". Includes a case study where the model is tested against historical data. Chapter 2: the governing equations, Ch3 The finite element method, Ch 4 numerical implementation and results, Ch 5 Case study, Ch 6 Concluding remarks. "The chapter is concluded with a list of topics that remain unresolved and for which additional work would be interesting or beneficial to the industry" (p. 171).
Kalaichelvan, R	2000	Function spaces and a problem of Banach	90	Investigates three function space topologies so as to be able to 'consider a problem of Banach on a function space level'. Gets partial results to: "When does a metric space have a coarser compact metrizable topology?"
Kirchner, U	2003	Approaches to ensembles of universes	103	3 parts, each focusing on different aspects of ensembles of universes and causally disconnected regions. 1) Partial result of the Flatness problem. 2) new approach leads to 'rediscover evolution equations for...' 3) Discuss philosophical, physical and probabilistic issues...

Candidate	Year	Title	Pages	Contribution to knowledge
Kleine, D	2002	Finite element analysis of flows in secondary settling tanks	169	"The development and implementation of a finite element approach to the simulation of flows in secondary settling tanks" (p iii) Primarily contribution appears to be in "developed code" but also includes "modelling approach, algorithm and computer program" (p112). Section 5.8.2 is headed 'an overall view of the algorithm' (p107). Flow chart is shown on page 110.
Moetsana-Moeng, IM	2002	A study of conceptualised links in the understanding of introductory Newtonian dynamics	249	Used concept maps to examine how students understand multi-conceptual links in counter-intuitive concepts (p i). Makes use of phenomenography. Study done on Wits Physics students. Students constructed concept maps and then were interviewed about their maps. (Student has HDE.)
Mori, M	2005	Modelling the krill-predator dynamics of the Antarctic ecosystem	303	Constructs model. Includes lots of contextual background about whaling and the harvesting of Krill.
Naidoo, I	2004	Nearness and convergence in pointfree topology	106	" We introduce and investigate the concept of a nearness structure on a sigma-frame. Analogues of the Samuel compactification, uniform coreflection and completion in the nearness sigma-frame setting are obtained. Convergence... integrating compactness, pre-compactness and paracompactness. Finally, the notion of uniform paracompactness is introduced and its relation with convergence is investigated." (from Abstract)
Plaganyi, E	2004	Walking the bridge from single to multi-species approaches in Southern African fisheries management	460	Abalone is impacted by encroaching rock lobsters – hence the need for multi-species model. Also looks at other multi-species applications – like whales.
Richardson, F	2004	Simulation models of rangeland production systems: simple and complex	202	Looks at the productivity and sustainability of livestock in the succulent Karoo of Namaqualand. Deals with long term models (>100 years). Long discussion of different types of models (this looked like padding to me – not much depth). Validated against actual data for a group of kids – mostly the model was OK, with some unexpected mortality due to sudden cold.

Candidate	Year	Title	Pages	Contribution to knowledge
Scott, L	2003	Legitimacy and decision making in developmental local government: participative MCDA in Stellenbosch	235	Uses participative action research and multi-criteria decision analysis to develop a new approach to allocation of scarce resources. Interesting combination of concerns with rigour (in modelling) and legitimacy (in application).
Solomons, D	2003	Topics in contemporary cosmology	211	Parts are in very different areas of cosmology (quantity rather than quality?) Part 1: Illustrates a claim using examples. Part 2: Partial solution of the equations of string cosmology in the string frame. Part 3: "derive a code for constructing the self-interacting potential V(0) of a universe in which..."
Tladi, S	2004	Well-posedness and long-time dynamics of β-plane ageostrophic flows	140	"We obtain the dissipative ageostrophic equations which describe the motion of a viscous incompressible stratified fluid with Coriolis force." "We prove the existence and uniqueness of solutions to the initial-boundary value problems corresponding to the dissipative beta-plane ageostrophic flows and then establish attractors of solutions" "We conclude with a derivation and discussion of Melnikov integrals and other separation functions for... " etc. One page abstract in this vein.
Wilcox, D	2002	Multivalued semi-Fredholm operators in normed linear spaces	182	Introduces a "new class of relations, Multivalued Linear Projections" (p8) in chapter 3. A section headed "Application of Fredholm operators" gives 3 areas of pure mathematics where Fredholm operators arise.
Witten, G	2002	Mathematical models of the physiological mechanisms affecting the adaption of growing cattle during and after a period of undernutrition	199	Develops a model, modifies an existing model, compares 4 models. Grazing animals adapt to under-nutrition. This thesis models these adaptations and looks at long term prospects for the animals after periods of under-nutrition. "The ability to predict the probable short- and long-term consequences of under-nutrition will support the planning and evaluation of measures to ameliorate under-nutrition on semi-arid and arid rangeland systems." (p vii)

Public and Development Management

Candidate	Year	Title	Pages	Contribution to knowledge
Africa, S	2006	Policy for managing access to intelligence information in post-apartheid South Africa	237 pages	Concerned with "the balance between secrecy and transparency in a democracy". It "explores policy options" and "compares the policy choices" of 3 countries. Argues for the need for a comprehensive policy package. (The impact of the Promotion of Access to Information Act 2000 on the intelligence services.)
Allais, SM	2007	The rise and fall of the NQF : a critical analysis of the South African National Qualifications Framework.	413 pages	Concludes that "the outcomes-led framework model leads to a system which is not only very complex and cumbersome, but also a poor basis for educational reform" ... "this thesis shows how neoliberal trends in thinking about education and public sector reform, and the social constructionist ideas about knowledge, both make the NQF appear as an attractive policy reform in SA" p380
Butcher, C	2005	Enabling housing markets not to work : an examination of serviced land and low cost housing delivery in Zimbabwe, 1992-1998.	164 leaves	"In sum the research argues that low income housing provision and serviced land delivery is a function firstly of the regulatory framework... but it is equally a function of the intergovernmental policy framework. It is the latter which is needed to underwrite the fiscal health of local governments where they are the primary delivery agencies and thus ensure the structural sustainability of delivery mechanisms". Also points out that the results apply beyond Zimbabwe. (from Abstract p iii)
Naidoo, K	2006	Shaping the telecoms network market structure in SA 2000-2003: the role of policy and regulation	236 pages, plus data tables	Assess the impact of policy and regulatory interventions in selected national markets... Explains how the managed liberalisation policy of the SA government has constrained growth... provides recommendations.. Uses "an information society paradigm" and multiple methods.

Candidate	Year	Title	Pages	Contribution to knowledge
Plaatjies, D	2008	Decentralized, co-operative governance of the public health system in SA	446 pages (Appendices start on p 369 – tables of data)	Co-operative governance system is contested at a central government level within the public health system, as well as between levels of government and the public health and finance sectors. Findings: 1) functional and structural decentralization of policy-making and implementation... contributes to undermining ... relations between public finance + health + central and provincial governments. 2) Central government is ... imposing coordinated solutions. 3) Central government uses 3 models: state control, supervision + interferences ... to achieve its policy intentions (written and unwritten). 4) classical agreements of decentralization are found wanting in the SA governance system.
van Nieuwkerk, A	2006	South Africa's post-apartheid foreign policy decision-making on African Crises	257 pages	Case studies of decision-making around foreign policy. "The study concludes that public policy making ought to be seen as a political problem solving activity in the face of complexity rather than a logical process involving well-informed calculations by rational actors...." (p. ix). Concludes with recommendations regarding the application of Allison's models (of decision-making) in SA.

Appendix E

THE RABBIT'S THESIS

Reproduced from Charlesworth et. al. (2007)

One sunny day a rabbit came out of her hole in the ground to enjoy the fine weather. The day was so nice that she became careless and a fox came up behind her and caught her. "I'm going to eat you for lunch!" smirked the fox.

"Wait!" pleaded the rabbit. "At least, wait a few days."

"Why should I wait?"

"Well, I'm just finishing my thesis on 'The superiority of rabbits over foxes and wolves.'"

"Are you crazy? I should eat you right now! Everyone knows that a fox will always conquer a rabbit."

"Not really, according to my research. If you like, come into my hole and read it for yourself. And if you're not convinced, you can go ahead and eat me for lunch."

"You really are crazy!" said the fox. But as he was curious and had nothing to lose, he went with the rabbit. The fox never came out.

A few days later the rabbit was taking a break from writing and sure enough, a wolf came out of the bushes, pounced on her and prepared to eat her. "Wait!" yelled the rabbit, "You can't eat me right now."

"And why is that, my furry appetizer?"

"I'm almost finished my thesis on 'The superiority of rabbits over foxes and wolves.'" The wolf laughed so hard that he almost lost his grip on the rabbit.

"Maybe I shouldn't eat you; you're sick … in the head. You might have something contagious."

"Come and read it for yourself; you can eat me afterwards if you disagree with my conclusions." So the wolf went down into the rabbit's hole and never came out.

The rabbit finished her thesis and was celebrating in the local lettuce patch when another rabbit came along. "What's up?" he asked. "You seem happy."

"I am. I just finished my thesis."

"Congratulations. What's it about?"

"It's about 'The superiority of rabbits over foxes and wolves.'"

"Are you sure? That doesn't sound right."

"Oh yes, I'm sure. Come and read it for yourself."

Together they went down into the rabbit's hole. As they entered, the friend saw a typical graduate abode, albeit a rather messy one after having a thesis written in it. The computer with the controversial work was in one corner. To the right was a pile of fox bones; to the left, a pile of wolf bones. And a large well-fed lion lounged in the middle.

The Moral of the Story: The title of your thesis doesn't matter. The subject doesn't matter. The research doesn't matter. All that matters is who your supervisor is.

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