PERSPECTIVES ON THE PURPOSES, PROCESSES AND PRODUCTS OF DOCTORATES: TOWARDS A RICH PICTURE OF DOCTORATES

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ABSTRACT

The last decade has witnessed major changes in British doctoral education. The emergence of professional and practice-based doctorates in particular, are beginning to prompt broad questions concerning the purposes, processes and products of graduate study. A growing diversity of doctoral provision is coupled with a disparate student population. For doctorates to evolve in a responsive manner, the complexity of provision and need must be understood. This work provides new insights into these changes by specifically focusing on the perspectives of students and graduates; something relatively unexplored.

The perceptions and experiences of 217 students and graduates from different types of doctorates at 4 institutions were examined through postal questionnaires and follow-up semi-structured interviews. Interviews were also conducted with 8 supervisors from each institution and 9 employers, to provide a snapshot of understanding in relation to students' views.

Results suggest that motivation varies with age. Younger students were more driven by the prospect of career enhancement and the development of research techniques, whereas older students gave more credence to personal development. Noticeable agreement was found over those resources that were regarded as both important and unimportant and all students considered both independence and collaboration important ways of working during a doctorate. Students' concepts of a doctorate and their understanding of doctoral capability did not seem to recognise the complexity and transferability of skills. The views of supervisors and employers varied in important respects from those of the students.

These findings are discussed and their political, institutional and methodological implications are explored. It is recommended that further work concentrates on exploring the perspectives of employers to continue enriching the understanding of doctoral education.

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Gratitude is owed to so many who helped throughout my PhD but a few deserve specific acknowledgement.

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This work would not have been possible without the consent of the institutions involved and the individual participants, especially Dr Rod King from the National Institute for Medical Research. Their interest and commitment to graduate education reinforces the importance of this work.

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Aims of the research

Doctorates are undergoing major change in Britain at the present time and are beginning to attract considerable research interest. The last decade has witnessed the emergence of professional and practice-based doctorates that are beginning to prompt broad questions concerning the purposes, processes and products of graduate study. The PhD is also receiving growing scrutiny and the formalisation and standardisation of research training are consequences of this. Hence, the overarching aim of this work is to provide new insights into the changing nature of doctorates in Britain.

In the current climate of credentialism and grade inflation, in an era of promoting lifelong learning and where the nature and relationship of work and learning are changing, this diversity of provision is set to continue. Clearly this is coupled with a pool of actual and potential doctoral candidates who are far from homogenous. Different modes of study, different sources of finance, and the huge age range of candidates engaging in doctoral activity must result in very different needs and expectations from graduate education. This study is predicated on a perceived need and that this is now an appropriate time to explore these differences and suggest how doctoral education can evolve by taking a responsive, rather than prescriptive course of action. Gaining insight into the views and requirements of all interested parties is clearly an essential method of achieving this.

This is the broad context in which this work has been located. Evidence from this research shows that the perceptions of employers and candidates are relatively unexplored. Consequently, this research focuses specifically on candidates' views of the purposes, processes and products of doctorates. The opinions of public and private sector employers and supervisors are examined in relation to candidates' views in Chapter 9. It is intended that this work will offer new understanding of candidates' motivations for undertaking doctorates, of the resources and experiences

they consider to be important or unimportant during a doctorate, of their conceptual understanding of what the essence of a doctorate is, and their views of doctoral capability. As a result it is hoped that this work will contribute to various interests which fall into three broad categories. These categories are national, political and academic interests, Middlesex University and work based learning interests, and methodological and personal interests. In any event, these interests collectively necessitate the research and shape its course and evolution.

National, political and academic interests

The last fifteen years has witnessed a growing political interest in graduate education. Concern over completion rates and the standards of research training expressed by the research councils, was a major catalyst in drawing attention to the quality and standards of doctorates. The 1996 Harris Review, the Dearing Report in 1997 and the recent work of the QAA (for example, the 'Code of Practice for the Assurance of Academic Quality and Standards in Higher Education: Postgraduate Research Programmes', 1999), have all been significant in raising the profile of graduate education. The establishment of the UK Council for Graduate Education in 1994 is also evidence of the growing attention to doctoral provision.

What is missing from the literature is an in-depth awareness of the growing diversity of candidates engaged in different models of doctoral provision. Most importantly, the perceptions, requirements and experiences of candidates within different doctoral contexts, are apparently neither widely discussed nor valued. Treatment of professional doctorates is sparse and discussion of their relationship to the PhD is limited. Issues surrounding doctoral education have generally focused on the structures and protocols, rather than grappling with the qualitative and 'messy' problems. This research seeks to redress this imbalance by taking the views of candidates as the starting point. Different types of doctorates from different subject areas (science, social science and education) within a number of institutions are targeted in order to reflect the complexity and diversity of provision and need.

Middlesex University and work based learning interests

In order for Middlesex to spearhead the development of a pan-institutional professional doctorate, it had to be underpinned by research. Consequently this piece of work was institutionally vital, in order that the design and development of the Doctorate in Professional Studies was contextualised and accompanied by depth of understanding. It is expected that this research has and will continue to play (see Chapter 10), a fundamental part in shaping the distinctiveness of the programme as well as maintaining parity with the PhD.

Methodological and personal interests

The need to take a more responsive rather than prescriptive approach to the evolution of doctoral education is paramount if diversity of needs are to be recognised. A consultative approach is already being explored, particularly by the ESRC, and this investigation of interested parties is intended to be a significant contribution to general understanding. A study of this nature expects to make a methodological contribution, given the innovative approach that is needed. The methodological framework had to incorporate and recognise the inextricable association of my role as a researcher with the topic of this work. This means that my position and perceptions form an explicitly important part of the thesis. My own personal interest and motivation for undertaking this particular piece of work must not be underestimated and fundamentally affected both the nature of the research, and the structure of the experience.

The combination of these four sets of interests means that exploring perspectives of doctorates is a live issue and one with a long future. These four areas of influence clearly shaped the course of action that was taken during this research. The confines of a PhD meant that an exhaustive study of the perceptions of all stakeholders was unfeasible. The intention was therefore to focus on the perspectives of students and graduates, drawing upon other interested parties for fuller understanding. This begins to explore the diversity of candidates needs and expectations that appears lacking from the literature, and contributes to a richer picture of doctoral education. My own

role as a research student provided an ideal opportunity to give this interested party priority.

Approach of the thesis

The thesis is divided into ten chapters that are situated within three parts. These are intended to reflect the methodological aim of developing a rich picture and a fuller understanding of various perceptions of doctorates, and especially those of doctoral candidates. Part 1, 'Building the Picture', consists of three chapters. Chapter 1 describes the methodological arrangement used to provide structure and strategy throughout the course of the work. A range of methodologies were used within an overarching framework of Soft Systems Methodology, given that the focus of this study is on exploring a variety of different perspectives. A discussion of the literature that relates to doctoral education forms Chapter 2 and information concerning each of the case study institutions forms Chapter 3. These contextualise the candidates' perspectives that follow in Part 2, entitled 'Enriching the Picture'. Chapters 4, 5, 6 and 7 discuss how the research was conducted and the main findings concerning the candidates' perspectives on the purposes, processes and products of doctorates. Chapter 8 gives a personal reflection on my experiences as a doctoral student and how this relates to the candidates' views. Chapter 9 discusses the perceptions of other stakeholders, specifically in relation to the views of the candidates. Part 3, 'Towards a Fuller Picture', contains the concluding chapter where major outcomes and the potential impact of this research are identified and recommendations for further action are specified.

Throughout the thesis, the term 'student' is used to refer to those studying currently, 'graduate' for those who have completed their studies and 'candidate' as a collective noun for both students and graduates.

PART 1 BUILDING THE PICTURE

Preface

The aim of Part 1 is to describe how, why and where this research has taken place. Chapter 1, 'the methodological architecture' highlights how this work was undertaken and is discussed first because it profoundly influenced the shape of the entire research. Detail obtained from relevant literature contextualises the focus of the work in Chapter 2 and continues to justify the necessity of this research. Finally, contextual detail continues in Chapter 3 with a description of the institutions where this research has been undertaken. These three chapters that comprise Part 1, provide a platform of understanding on which a more focused and detailed discussion of the stakeholders' perspectives can be given in Part 2.

Chapter 1 The Methodological Architecture

Introduction

Methodology can offer structure and strategy for both the researcher's thinking and for project activity and it has played a pivotal role throughout this research process. It has shaped the entire nature of the research approach and it is only accurate to reflect this in the explanation and discussion of the project activity and findings. To relegate it to one chapter would not do the methodology justice and would be an inaccurate reflection of the centrality of its role. While this chapter provides a detailed discussion of the methodological processes within this project, a 'rich picture' (see pages 7 and 8 for explanation) accompanies every additional chapter to methodologically represent the contribution of that section. This is intended to acknowledge not only how the methodology has informed the research activity but also how the research activity and findings have impacted upon and shaped the methodological thinking.

The methodology is described in the three subsequent sections. These sections reflect the different dimensions where the methodological activity has taken place. It is worth noting that these levels are not hierarchical but mutually co-exist. The 'Methodological Dimension' discusses the methodological arrangement that has been used and describes in detail the individual methodologies, the reasons for choosing them and the roles that they played throughout the research process. The 'Operational Dimension' describes how the methodologies were implemented and includes a review of this procedure. The 'Ideological Dimension' concludes this chapter by drawing together the key methodological concepts that are taken forward into Part 2.

Soft Systems Methodology (SSM) operated through these three different dimensions in order to provide total contextual shape to this research process: methodological, operational and ideological. It drove the nature of the methodological approach, that consequently provided a framework to organise the project activity and also

structured my learning process. In addition to SSM, ethnography was used in respect of my participant observation of the DProf development and of my own experiences as a doctoral student. This exposure was associated with a case study approach because of the location of the ethnographic work. A survey was used in respect of the sampling strategy. The rationale for the selection of SSM, ethnography, case study and a survey approach and the particular way they were arranged, are discussed below in the 'Methodological Dimension'. Associated with these methodologies are a number of tools of data collection; documentary searching, reflective diary keeping, questionnaires and semi-structured interviews. The forms of data analysis used were also methodologically linked. SSM has therefore been used to triangulate the methodological approaches, the tools of data collection and the methods of analysis. These arrangements will be discussed in greater detail throughout the course of this chapter.

The Methodological Dimension

Soft Systems Methodology

Within the context of this research, Soft Systems Methodology (SSM) was chosen to provide the architectural framework. This methodology provides a coherent form for a project and the configuration within the methodology can offer a highly applicable method of accessing the data that is required. SSM provides a means of getting to grips with human activity systems in a well structured but flexible way (Checkland 1990). It is orientated towards bringing about change within the project context that corresponds with the ideological intentions of this research. The methodology involves modelling the perceived problem situation expressed as a system and comparing it with the 'real-world' situation (Checkland 1990). SSM recognises that while the researcher is aiming to remedy a problem within the project situation, that problem is subjectively perceived and may consequently not be viewed as problematic by others. The methodology facilitates a holistic perspective because it forces the researcher to consider all the players involved in the problem situation. This achieves what Checkland terms a 'rich picture'. This is essentially a pictorial representation of all the interested parties who impact on the issue(s) in question. This enables the researcher to see how they are interrelated. This is not necessarily a

one-off activity but is maximised by being an on-going component throughout the research process. It is highly likely to change as data is collected and understanding grows. As outlined on page 6, each chapter in this thesis concludes with a rich picture that highlights the main issues raised. Chapter 10 closes with a rich picture that shows where the main contributions of this work lie.

Associated with the development of rich pictures is the construction of 'CATWOE' and subsequently of 'Root Definitions'. These are essentially processes through which understanding of the perceptions of the interested parties can occur. Below are Checkland's definitions of the CATWOE mnemonic (which did not originally appear in the CATWOE order):

Consideration	Amplification
(1)'Ownership' (O)	Ownership of the system, control, concern or sponsorship; a wider system which may discourse *about* the system
(2)'Actor(s)' (A)	The agents who carry out, or cause to be carried out, the transformation process (es) or activities of the system
(3)'Transformation' (T)	The core of the RD; A transformation process carried out by the system; assumed to include the direct object of the main activity verb(s)
(4)'Customer' (C)	Client (of the activity), beneficiary, or victim, the subsystem affected by the main activity (ies); the indirect object of the main activity verb(s)
(5)'Environmental and wider system constraints' (E)	Environmental impositions; perhaps interactions with wider systems other than that included in (1) above, these wider systems being taken as given
(6)'Weltanschauung' (W)	The (often-unquestioned) outlook or taken-for-granted framework which *makes this particular RD a meaningful one*

(Smyth and Checkland 1976)

The Transformation Process is fundamental to the CATWOE criteria, and is critically linked with W. It is this W that sets the perspective and makes the T Process meaningful; 'the definition only makes sense from a particular point of view, it must be possible to identify the W which gives a meaning'(Wilson 1990, p46). Fundamental to this thesis is the aim to transform understanding of doctoral education, especially concerning the perspectives of candidates.

Both the W and the T Process are inherent components of the Root Definition. A Root Definition shows what the primary function or intention of the activity system is that is being described. Nevertheless it is still only in relation to the assumptions and perspectives that make up the W. It is also an expression of the T Process as it demonstrates why and how the object under examination will change. 'A root definition expresses the core purpose...as a transformation process in which some entity, the 'input', is changed, or transformed, into some new form of that same entity, the 'output''(Checkland 1990, p33). Table 1.1 on page 10 shows some initial ideas of how the concerns of various doctoral stakeholders might relate to the CATWOE components. They were created within the early stages of the research process and were a starting point to consider some of the issues that could be important.

The flexibility of SSM means that it is capable of accommodating a variety of philosophical and epistemological perspectives. This research is largely underpinned by interpretative rather than positivist or empiricist notions and therefore a largely qualitative approach is most appropriate to tackle this research project. The type of data that are required centres around opinions, attitudes, perceptions and experiences, and only an overarching qualitative approach will adequately reach and reflect it. To adopt a purely quantitative stance would mean that only a very limited amount of feedback could be gathered. It would not only affect the amount of data that could be obtained but also the type (Riley 1996). To adopt a more quantitative stance would render it impossible to get the same richness of responses that result for example, from face to face in-depth discussions. This is because of the way in which SSM has been employed and the integrated use of different methodologies.

Table 1.1 Initial CATWOE ideas

	Doctoral Students & Graduates	Doctoral Supervisors	Doctoral Employers
'C ustomers'	doctoral student, doctoral supervisors, university, employer	potential doctoral students	doctoral students
'A ctors'	doctoral organisers, supervisors, doctoral student	doctoral supervisors/organisers, academics	doctoral organisers/supervisors and employers
'T ransformation Process'	the needs of potential doctoral student x----T Process----Dr x(doctoral graduate)	the needs of supervisors, organisers x----T Process---- doctorate to satisfy academic criteria	the need for a high calibre employee to perform certain tasks----T Process----need met by recruiting a doctoral graduate to satisfy these criteria
'W eltanschauung'	a doctorate can be personally beneficial for employment opportunities	a doctoral student is beneficial within our dept/institution to make a contribution to the field	a doctoral graduate can prove beneficial to employ for their distinctive specialisms and capabilities
'O wner(s)'	University, Department/School, supervisors	University	University
'E nvironmental constraints	financial, personal, impact of doctoral organisers affects what is on offer for the student, impact of doctoral recruiters affects what the student needs might be	influence of other university doctoral developments, market requirements, doctoral recruiters, non academics	student demand, influences of other doctorates
Root Definition	A University owned system to meet the needs of potential doctoral students by providing them with a publicly acknowledged doctoral capability	A University owned system to meet the needs of doctoral organisers/supervisors in the context of a changing doctoral situation	A University owned system for the development of those skills and abilities needed to meet the demands of doctoral employers and/or CPD

To have the concepts of interpretivism and empiricism in opposition is not necessarily an accurate reflection of the complex nature of many large research projects and 'conceptions of social reality' are perhaps often more integrated (Cohen and Manion 1994, p6). Certainly in this case, by using SSM as the framework methodology, elements of both concepts are present. It could be argued that coming from a systems tradition, SSM brings aspects of empiricism to social structures. However, operationally SSM takes on a much more subjective and interpretative guise. This duality of reference points could be emphasised in varying degrees depending on the particular use or adoption of the methodology. For the purposes of this research, this 'uncomfortable' position between the two traditions is not problematic and indeed it brings a refreshing and constructive look at the issues in question.

Unquestionably the main value of SSM is that it recognises the complexity of real-life problem-based research. It is a methodology which enables the researcher to tackle these issues and understand the context in which they are situated (Wilson 1990). This 'call for holistic understanding' (Fuenmayor 1997, p63) is a feature of systems thinking that has been embraced by the framework of this research. It is the interdisciplinary nature of Soft Systems Methodology that makes it such a valuable approach to social research. It is the recognition of the context surrounding the issue in question that this research has endeavoured to embrace.

The use of SSM within this research is selective rather than exhaustive. Consequently there are stages of Checkland's methodological process that have not been exploited as well as those that have been emphasised. Arguably the key feature of SSM is its emphasis on the context of the problem situation (as discussed above). It was not felt necessary to adhere rigidly to the seven stages that Checkland identifies (which are concerned with expressing the problem situation, developing root definitions and conceptual models, comparing these models with the real situation, identifying and implementing action to remedy the problem), and follow this pattern sequentially. Rather, a less literal interpretation has been used and stress has been placed on understanding and employing the philosophy of the

methodology. By using it to provide the architecture for this research, it was felt important to get a sense of the overall flavour of SSM. Once the general principles have been absorbed the researcher is able to take a more liberal and creative approach to some of the more specific requirements. This research embraced Checkland's early stages of identifying and understanding the problem context. This project also utilised the notion of understanding being perceived and the CATWOE and Root Definition stages were carried out prior to the data collection commencing. However, because the 'change' objectives are essentially ideological and to do with contributing to understanding, tangible comparisons between 'real' and 'perceived' worlds were not felt to be particularly helpful. Instead, adding to and developing a rich picture was seen as the intended outcome of the research, rather than a stepping stone. The earlier stages in Checkland's SSM process have therefore become inherent components of both this research process and of the outcomes.

The Methodological Construct

The growing complexity of graduate education and of this research investigation resulted in several distinct but co-existing elements to the project. These different aspects needed to be addressed using different methodologies. However, the rationale for this was not to fragment the topic of research and reduce it to individual, isolated components but rather to adequately represent the various aspects within an overall framework. SSM provided this framework and by bringing together the various components, it provided systematic structure to the project. Social research on a large scale is inevitably complex with differing strategic approaches required for different elements of the research. It would therefore seem necessary to access those distinct elements with appropriately orientated methodologies. This 'multimethodology' (Mingers 1997; Mingers and Gill 1997) approach to problem solving has been discussed at length by Flood (1997) where he states that 'methodologies need to be interrelated in order to address complex issues.' (p86). Within this project context, SSM provided coherence to this 'interrelation' by triangulating the methodologies. A multi-dimensional, methodological approach was created for which SSM provided the methodological architecture. This offered the opportunity to focus and re-focus the research thinking

and action. The shape of this model shown in Figure 1.1 on page 15, represents both this interpretation of SSM and therefore this research process. This process was not circular (where the starting and finishing points are the same), but rather the research activity evolved, bringing the researcher to a point of greater understanding. This is because the research was concerned with the continuous examination of the perspectives of key players involved in the design, development and use of doctorates and particularly the inter-relationship of these perspectives. Developing and re-developing a rich picture is both an outcome and an integral component of the on-going processes of this research. This development can be maximised by the use of more than one methodology and more than one method of data collection. Not only does this offer more than one type of data but this approach also exposes the research and the researcher to more than one theoretical perspective. If the development of a rich picture is about understanding all the views and concerns of interested parties and the issues that impact upon the problem situation, it can be maximised by 'methodological triangulation' (Denzin 1970). 'Triangulation may be defined as the use of two or more methods of data collection in the study of some aspect of human behaviour' (Cohen and Manion 1994, p233). This could be interpreted as only referring to methods of data collection so for the purposes of this research the type and usage of triangulation need to be clarified. Triangulation was used for three purposes, to triangulate the methodological approach, to triangulate the methods of data collection and to triangulate the methods of analysis. The last two will be discussed in due course within this chapter but the first, concerning methodological triangulation needs exploring.

This was essentially a qualitative piece of research and utilisation of one methodology would have only provided a very restricted perspective and a limited set of data. This may not have been an accurate reflection of the issues in question. In any case, exposure to alternative perspectives would increase understanding of the complexity of the problem. SSM has been used as an architectural framework to hold the other methodologies together, and so in a sense, has also acted as a means of triangulating all the approaches. The concept of triangulation offers the possibility of increased validity and reliability of the data. Obtaining data by using more than

one methodological approach and more than one instrument of data collection, forces both the researcher and the issues in question to be subjected to more than one perspective. This allows comparisons to be made between the different sets of data and does not allow conclusions to be made on the basis of one set of results drawn from one methodological perspective.

SSM and the concept of triangulation share some important characteristics which gave additional credence to SSM being used within this research. Cohen and Manion describe triangulation as 'an attempt to map out, or explain more fully, the richness and complexity of human behaviour by studying it from more than one standpoint.'(1994, p233) This highlights essentially two elements which are common to both and which are applicable in this context. Firstly, both SSM and triangulation are holistic in nature and are concerned with getting to grips with an issue in its totality. Secondly both SSM and triangulation are aimed at tackling complex issues or problems, and triangulation in particular allows that complexity to be accessed and accurately represented by using more than one methodology.

It could of course be argued that many of the processes intended for this research project are features of Action Research. The concept of problem solving, the perceived cyclical model of the research process and the expectation of change as the product of the research, are certainly characteristics of Action Research; 'the concept of action research is that of simultaneously bringing about change in the project situation (the action) while learning from the process of deriving the change (the research).'(Wilson 1990, p2). However, it is equally arguable that these peculiarities are common to Soft Systems Methodology and developed further by it. At what point do they remain distinct elements of Action Research or is Action Research inherently part of Soft Systems Methodology? Whatever the conclusion, both methodologies share some principal characteristics. However, SSM undeniably places more attention on identifying, contextualising and understanding the problem situation before attempting to solve it. This emphasis has played a crucial role in this research and may not have been achieved if an alternative methodology had been employed.

Figure 1.1 The shape of the methodological architecture

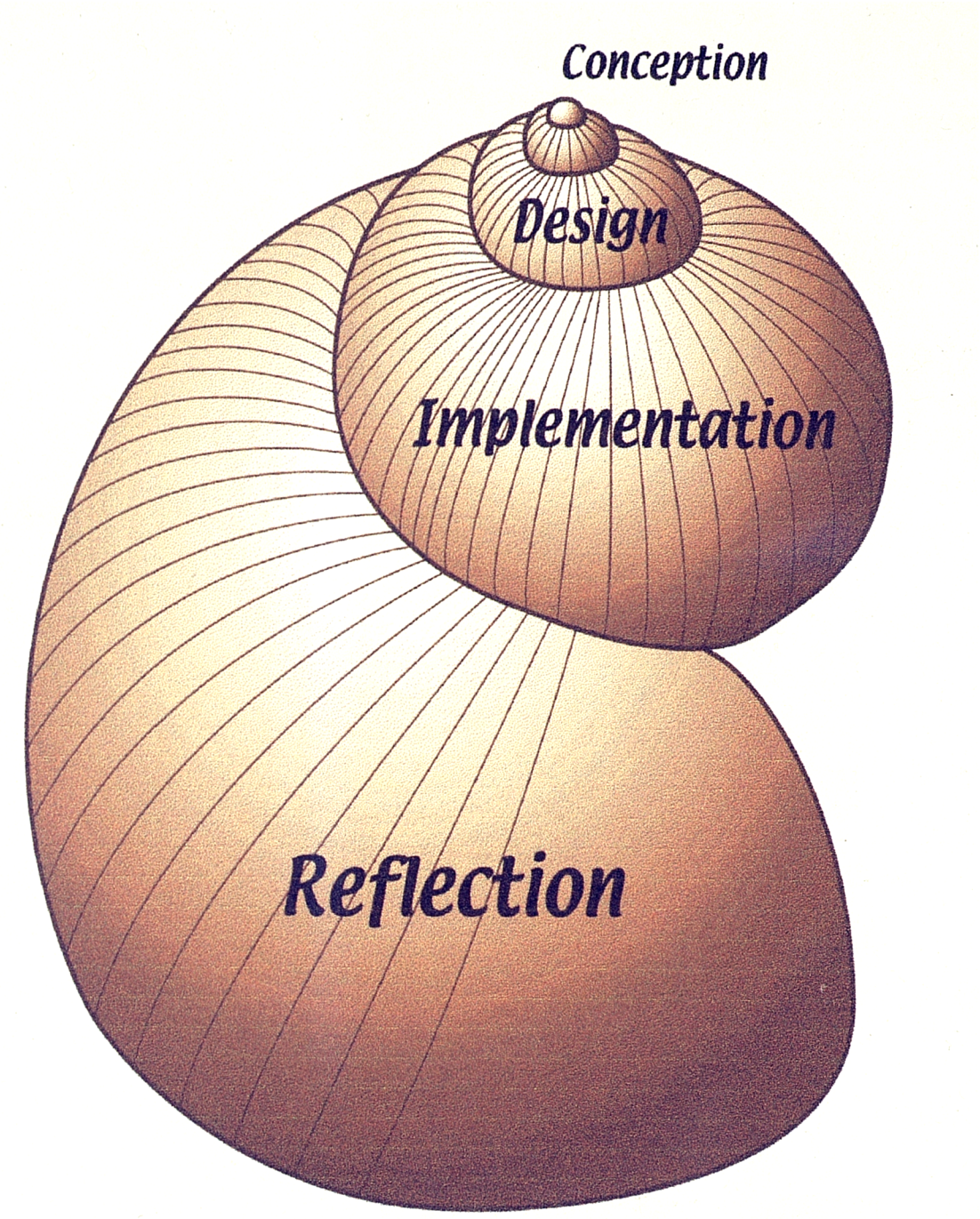


Figure 1.1 on page 15 demonstrates that that the research process, methodologically, operationally and ideologically is an evolving one. It is necessary to represent the research process in this way rather than a vertical spiral because each phase does not exist in isolation and moving up and out of each phase does not occur. Each stage is inter-linked and the activity of reflection goes right to the core of the whole process. Each phase grows in size and depth as my understanding grows and changes, and the optimum is reached at the widest outlet of the model. This model is 'shell-like', not flat. This is significant given that the research process itself is not flat and static, but organic and three-dimensional. It might be argued that SSM is cyclical in nature (a simple cycle or even a spiral). However, my interpretation demonstrates that a more interactive spiral can clearly be accommodated, not just conceptually but also in practice. This interaction is brought about by the reflections of the researcher within the project context. The reflections may include reflections about the project activity and about the experiences and perception of the researcher. This reflection in context means that this activity and the project progress are mutually acting and reacting. This provides the opportunity for maximum transformation. This transformation is holistic in nature because it is not just restricted to change within the project context but incorporates the self-development of the researcher. To view SSM as an interactive spiral and not just cyclical allows the methodology to be used to its fullest potential. This is only achieved by explicitly recognising the ethnographic aspect in this process. Ethnography is inextricably associated with the activity of reflection and is crucial to the full exploitation of SSM.

Ethnography

A key component of this research project was the development of the Masters/Doctorate in Professional Studies at Middlesex University. Exposure to this has provided insights into the design and development of a new pan-institutional professional doctorate. My role as a researcher altered from initially being an observer of the conceptualisation of the programme, to then taking a more participatory role in its design, development and implementation. My intervention and active participation has consequently increased considerably. The methodology required to structure and capture this particular aspect of the research had to be

ethnography. This allowed the in-depth examination of one aspect at one location where the researcher was both a direct observer of the social setting under scrutiny and a participant within it; 'the direct observation of an organisation or small society, and the written description produced.' (Jary and Jary 1991, p204)

An ethnographic core to Figure 1.1 exists and consists of two interactive elements. The first is my participant observation role in the formulation of the Doctorate in Professional Studies and the second is my participant observation role as a doctoral research student. The four phases of conception, design, implementation and reflection highlight the stages that both of these ethnographic elements experienced. My exposure to the DProf was from the initial stages of conception, through to the design of the programme, to my experiences of the initial implementation of the programme with the first cohorts of candidates and finally to a period of reflection on the totality of the process and experience. A comparable journey has also been followed within the other ethnographic element. My experiences as a doctoral research student have taken my initial research ideas from conception, to the practical design of an appropriate research strategy, to the implementation of that strategy and the associated data collection processes and finally to the overall reflections, analyses and interpretations of the findings and process.

Although this aspect of the research has been described separately, it is debatable as to whether or not features of ethnography are implicit within SSM. Both ethnography and SSM are involved with the study of human activity systems. SSM places great importance on the researchers' contextual role and their subjective perceptions of the issue in question. Checkland (1981, p152) asserts; 'It is the core of the idea that the researcher does not remain an observer outside the subject of investigation but becomes a participant in the relevant human group. The researcher becomes a participant in the action, and the process of change itself becomes the subject of research.' This relates to Baszanger and Dodiers' (1997, p8) identification of three aspects that ethnography attempts to address; '1 the need for an empirical approach; 2 the need to remain open to elements that cannot be codified at the time of the study; 3 a concern for grounding the phenomena observed in the field.' This

highlights the similarities between ethnography and SSM and demonstrates how complementary certain features of ethnography are to SSM.

The second point about ethnography raised by Baszanger and Dodier has particular relevance to my involvement in the development of the Doctorate in Professional Studies programme. They claim that the researcher must remain open to unforeseen activities, and not let the research dictate the direction of events. This was certainly necessary in the initial stages of my involvement with the DProf, where I was merely an observer. However, as my participation became more active and as I had an increasing influence on the programme's development, my own doctoral research and the evolution of the DProf became inextricably linked, both informing and reforming each other. Consequently, there is a tension between openness and the practical need of the researcher to have some kind of methodological strategy. Baszanger and Dodier (1997) recognise this conflict of duties and roles for the researcher; 'By definition, ethnographic study design is a hybrid approach in which the field-worker is present in two agencies, as data gatherer and as a person involved in activities directed towards other objectives.' (p10).

However, Baszanger and Dodiers' first point concerning ethnography seems to derive essentially from a positivistic approach. 'The only true knowledge is scientific knowledge, i.e. knowledge which describes and explains the coexistence and succession of observable phenomena...'(Jary and Jary 1991, p484). This definition picks up on an aspect of the positivist approach, which has important consequences for the role of the researcher. If observations are based on a series of facts, there is an objective quality about them. Any direct involvement by the researcher to affect those factual observations jeopardises that objectivity. This leads to a very passive form of ethnography and in order to understand the *process* of the context under examination as well as the cause and effect, it is not appropriate just to be an inactive observer. For the purposes of this strand of the research, a much more dynamic and participatory role needed to be adopted. Findings from this research indicate that Middlesex's doctoral development has significant consequences both within the institution and more broadly in relation to educational policy. It was

therefore vital that the researcher was fully immersed in the developmental processes in order to appreciate the political significance. By being involved in the conception of the programme, the researcher was able to absorb the ethos of the initiative. An important part of this was the involvement in the validation processes of the programme, where the researcher was exposed to the institutional politics and opposition. Political significance is fundamental to the implementation and dissemination stages of the development where an awareness of market trends and national and international initiatives are key to the success of the programme. If I had remained a research student, my ethnographic involvement would have been very different, as would the relationship between my research and the DProf development.

The other element of this research that required an ethnographic approach was the participant observation of myself as a doctoral student. This examination was obviously inextricably linked with the focus of the research. Inevitably the analysis of my own experiences and reflections fed in and off of the other data obtained by other methodological approaches (how these were captured are described on page 23). Ethnography was the only methodology that could have adequately tackled this important aspect and provides an interesting alternative dimension to an otherwise singular use of this approach.

Case Study

A Case Study approach was relevant because four institutions provided locations from which the primary source data were collected. This approach follows the ethos of this research because of its subjective and interpretative roots and the recognition of the complexity of social research. This Case Study approach is obviously closely aligned with the ethnographic involvement, especially in relation to my Middlesex exposure. As a result of this, there have been two variants of the Case Study involvement. Participant observation was relevant for the Middlesex experience and non-participant observation for the work conducted at other institutions. This is discussed at more length on page 24.

Survey

The adoption of a survey approach provided a method of accessing the total target population from the institutions which would not have been feasible by any other means. This approach complemented the other, more qualitative methodologies. The amount of data obtainable through using a survey, meant that the in-depth and detailed information acquired from the other methodological approaches, had more generalisability. The associated methods of data collection are described in the following section.

The Operational Dimension

Selection of sample groups and case study locations using SSM

The principal sample groups from which data were obtained were doctoral students and graduates, although information relating to candidates was also sought from supervisors and employers. These four categories were selected to provide insights from the immediate interested parties who have a direct involvement in the doctoral process. A range of responses were required that were indicative of the attitudes and experiences throughout the doctoral process. At the operational level SSM was used to adopt a more functional and pragmatic role in relation to the project activity. SSM was crucial during the process of selecting the sample groups and this was assisted by the development of a Rich Picture. This was first carried out within the early stages in the research process and provided an initial starting point for my contextual understanding. Inevitably however, this has been an aspect of the research activity that has changed as my knowledge and understanding has evolved. The context in which the issues in question were situated clearly required an on-going, detailed examination so that a firm grasp of the factors that impacted upon those areas were understood. This pictorial representation of the initial Rich Picture is shown at the end of this chapter on page 30. This enabled the project's complexity to start to be captured and also allowed the identification of links and patterns between interested parties that may otherwise have been missed; '...pictures are a better means for recording relationships and connections than is linear prose'(Checkland and Scholes 1990, p45). This process was not only undertaken at the start of the research but was an integral method of recording the changing context as my understanding

developed. The interested parties in addition to the ones selected as sample groups were also examined but different strategies and tools of data collection were used. Time and resource constraints meant that only the immediate stakeholders could be targeted for primary source data and that secondary source material would provide the majority of the contextual data for other parties.

Four institutions were selected to obtain samples of doctoral students, graduates and supervisors. These were Middlesex University, Bristol University, Imperial College of Science, Technology and Medicine and the National Institute for Medical Research. Details of and the rationale for the selection of these institutions is given in Chapter 3.

SSM was used as a means of triangulating the selection of the sample groups and allowed the researcher to maintain a holistic perspective. It also prompted the researcher into remembering that the primary source data from the immediate stakeholders could not stand alone but needed to be situated within a broader sampling strategy. This obviously had implications for the types of research instruments which were used.

Selection and utilisation of research instruments and triangulation using SSM

Instruments of data collection were selected which directly related to the methodologies used to access the different components of this research project. Although the instruments were essentially distinct ways of obtaining different types of data, together they formed a coherent and complementary package. Just as SSM was used to triangulate the methodologies and the selection of the sample groups, it also acted in a similar way for the instruments of data collection. SSM allowed a holistic perspective to be maintained, not just in relation to the information that emerged from the data collection processes, but actually on the way in which the instruments were viewed and employed.

Table 1.2 Kinds of information sought and methods for obtaining them.
(Adapted from Cohen and Manion (1994) 'Research Methods in Education. Routledge

Kinds of information	*Methods used*			
	1 Questionnaire	2 Interview	3 Participant Observation	4 Documentary Searching
1 My own experiential development			XX	
2 National/international contextual information				XX
3 Insights into the development of the M/DProf			XX	X
4 Opinions and experiences of doctoral students/graduates	XX	X		
5 Opinions and experiences of doctoral supervisors/employers		XX		

XX = most efficient means
X = supportive means

While it was very important to have instruments that obtained different types of data in order for the rich picture to be developed and understood in its entirety, these needed to be complementary. The process of using different types of instruments required different skills of the researcher and the action of bringing these together, provided a fresh insight into how each was regarded. The instruments were both qualitative and quantitative (see Table 1.2). While most of the data required were qualitative, the choice of one quantitative instrument provided a complementary set of data.

Associated with the ethnographic core to this project's methodology has been the instrument of participant observation. This was the most appropriate instrument for both dimensions of the ethnographic exposure because the researcher was actively involved in the communities of each context. An ethnographer '...gathers data by living and working in the society or social setting being researched, seeking to immerse him or herself as fully as possible in the activities under observation, but at the same time keeping careful records of these activities.' (Jary and Jary 1991, p204). The two dimensions of the ethnographic work described previously were captured essentially by similar means but are now discussed separately. Firstly, in order to record my exposure to the development of the DProf, a detailed log was maintained throughout the entire process. This was a record of meetings, of associated ideas, of the validation process, of my initiation into the teaching on the programme and also of my own reflections on this experience.

The other ethnographic dimension concerned my own experiences as a research student. The process of recording this experience was similar because a reflective diary was maintained throughout the doctoral experience (insights from this are discussed in Chapter 8). Entries were made largely on a monthly basis or whenever the need arose, in order to record a significant moment in my PhD journey. This valuable tool of data collection allowed experiences to be captured, reflection to occur and for experience to be changed into purposeful learning.

The use of the Case Study approach also had associated instruments of data

collection, which were closely affiliated to the ethnographic ones. While participant observation obviously provided the means of data collection for the Middlesex University case study location, non-participant observation was used to obtain information from the other institutions. Clearly my involvement was not so direct and my role within these institutions were very different compared with Middlesex. Observation used both secondary and primary sources. Secondary because understanding the institutions came from relevant documentary material, and primary in relation to the observations that took place from the questionnaire feedback and interview situations. It is debatable where interviews sit in relation to an associated methodology and have been aligned with a survey approach (Cohen and Manion 1994). However for this research, different features of the interview were associated with different methodologies and the observational function of an interview was associated with the case study approach. The information captured by the interview process was therefore contextually broader than the straight exchange of information that can occur between the interviewer and interviewee.

Associated with the Survey methodology was the use of two postal questionnaires (see appendices 1 and 2). As data were required from a large population spread throughout four different institutions, this tool provided an appropriate means of accessing this population. This formed a preliminary round of data collection, which aimed to gather data for relational analysis as well as for calculating frequency of responses (Cohen and Manion 1994). This approach also provided a quantitative aspect to complement the predominantly qualitative perspective adopted. A questionnaire is partially a descriptive approach that allows current conditions to be described and so it played a crucial role in contributing to the understanding of the rich picture. The constraints on this research meant that the administration of a postal questionnaire was the only feasible way of obtaining opinions and experiences from the selected sample groups. In order to maximise the response rate, suitable consideration was given to the importance of a well-structured and clearly designed questionnaire. It was administered by post so the questions needed to be unequivocal and the layout had to facilitate easy completion. It was felt important that the entire questionnaire should only consist of one piece of paper. Care was therefore taken in

the design so that the number of questions did not exceed two sides of A4 paper. The questionnaire for the doctoral students was printed on yellow paper and green for the graduates to make it distinct from other mail the respondent may receive and to make initial analysis easier. A covering letter explained the purpose of the questionnaire within the overall aims of the research project. It also requested that the questionnaire was returned within two weeks of receipt in order to promote a sense of immediacy in the completion and the recipients were assured of confidentiality. A stamped, addressed envelope was also enclosed with the questionnaire in order to maximise the chance of completion and return.

The content of the student and graduate questionnaires was designed using the four P's that emerged from the contemporary literature; doctoral purposes, processes, products and protocols (see Chapter 3). In broad terms these categories encapsulate the main areas of inquiry. The first section of both questionnaires began with a list of factual questions referred to for analytical purposes, as 'independent variables'. This information provided the starting point for comparisons. The participant's name and contact details were requested so that follow-up interviews could be conducted on the basis of the completed questionnaire. The remaining questions in part 1 offered a series of options for a tick box response with an 'other please specify and describe' category where appropriate. The participant was asked what type of doctorate is being or was undertaken (depending on whether it was the student or graduate questionnaire). A number of options were provided of either professional doctorates or the PhD. Information on the associated institution, the participant's subject area, their mode of study, source of finance and age on completion of the doctorate were requested.

An additional section on the graduates' questionnaire was added next in the layout. This asked for their current employment and whether the post specifically required a doctoral graduate. Permission to contact their employer was also sought to provide the opportunity for follow-up work. The remainder of the questionnaire was common to both students and graduates with a shift in grammatical tense where necessary.

The next section entitled 'purpose' was the first of the opinion-based questions and required each response to be placed on a scale of 1-6 ranging from 'not at all important' (1) to 'extremely important' (6). This explored the participant's personal reasons for beginning a doctorate and eight possibilities were offered plus a ninth 'other' category. Reviewing contemporary literature influenced what options were included. For example, much literature spoke of a doctorate as a research training and as a means of entering academia. These factors were consequently included in the questionnaire to explore what kind of candidates were motivated by them. In contrast, little literature focused on the possibility of candidates being driven by personal development or for culminating their professional career. From my exposure to the DProf, I suspected that these were important to some candidates. Therefore, both the inclusions and omissions in the literature informed the design of these options in the questionnaire. This structure for completion was continued into the next section which asked the participant more broadly to define their conceptual understanding of a doctorate. Again participants were asked to score the importance of the ten options.

'Resources and experience' followed a similar format where participants were asked how important fourteen resources or experiences were during a doctorate. This list was also compiled using the literature. An open-ended question asking if any of these options had not met their requirements concluded this section. A different approach was used for the 'distinctiveness of a doctoral graduate' question. This was entirely open-ended with no responses offered and required the participant to consider the particular characteristics or capabilities of a doctoral graduate. This was deliberately not situated at the bottom of the second page as it was felt that participants would be less likely to complete an open-ended response if it came last in the questionnaire. As this was considered to be an important issue, maximum chances of completion needed to be ensured. 'Distinctiveness' was followed by 'ways of working' which reverted back to the 1-6 scoring. Participants were asked how important different ways of working were during the doctoral process and three options were given. This was followed by an open-ended question asking how central collaboration was to their own experiences. Finally the participant was

thanked and given an address for additional correspondence.

The questionnaire was piloted after the final draft was completed. A small group of participants, who were not involved in the research project agreed to receive, complete and comment on a copy of the questionnaire. This process was extremely valuable in aiding the clarity and presentation, both of the questions and of the layout of the document.

The significance of considering methods of analysis at these conceptualisation and design stages should not be underestimated. What do the responses mean, what needs to be shown by them and what role do they play in the overall analysis and interpretation of results, were significant questions that had to be wrestled with as they potentially affected the entire outcome and orientation of the project. A coding framework was established using SPSS before the distribution of the questionnaires. Each response for the closed question was given a code and the open-ended questions were analysed separately. On return, each questionnaire was given a number to correspond with the data input. This method of analysis was considered most appropriate, as some form of statistical or numerical representation was required. This was thought to provide a complementary backdrop to the more in-depth qualitative data to be gained by the open-ended questions and by interviewing.

The SSM CATWOE process discussed previously on pages 8 and 9, informed the criteria that were used for the question structure. Within this, the Transformation Process generated perceptions about the needs of the four sample groups in relation to doctoral programmes and graduates and what they might identify and value as the core features of change within the doctoral process. The Root Definitions and completed CATWOE criteria for each interested party shown in Table 1.1 on page 10, increased the familiarisation of the researcher with the issues in question. Developing this CATWOE also demonstrated to me the importance of the Transformation process. It became clear that this would prove critical in the formulation of my questionnaire and interview structure. Issues about the distinctiveness of a doctoral graduate and the processes and structures within a

doctorate are obviously associated with this thinking.

Analysis of methods using SSM

The methodology and the instruments of data collection described were expected to yield data which needed both qualitative and quantitative analysis. This is described in detail in Part 2 but it is appropriate at this stage to signal that the analytical strategy was closely aligned to the broad methodological framework discussed in this chapter. The kinds of analytical tools required were varied and ranged from the identification of main themes and issues that emerged from documentary records, to statistical computation. However, the aim is to keep the theme of holism constant. It is important to regard these analytical tools as a package and not as isolated units. In effect this meant that triangulation was necessary in order to co-ordinate the tools so that it was evident that analytical pluralism acted as a complementary process. As described throughout this chapter, triangulation obviously incorporated the essence of SSM. Considerations of perceptions, of a dynamic and fluid situation and of regarding the problem as situated, were all crucial to consider during the phases of analysis. And finally I would like to emphasise the consideration of analysis as an ongoing thread throughout the entire research. This appears to be an inherent component of SSM and means that analysis is not just an activity which occurs after data collection is complete. Analysis is inextricably linked with the processes of problem identification and contextualisation and therefore inherent features of the early stages of the SSM dynamic.

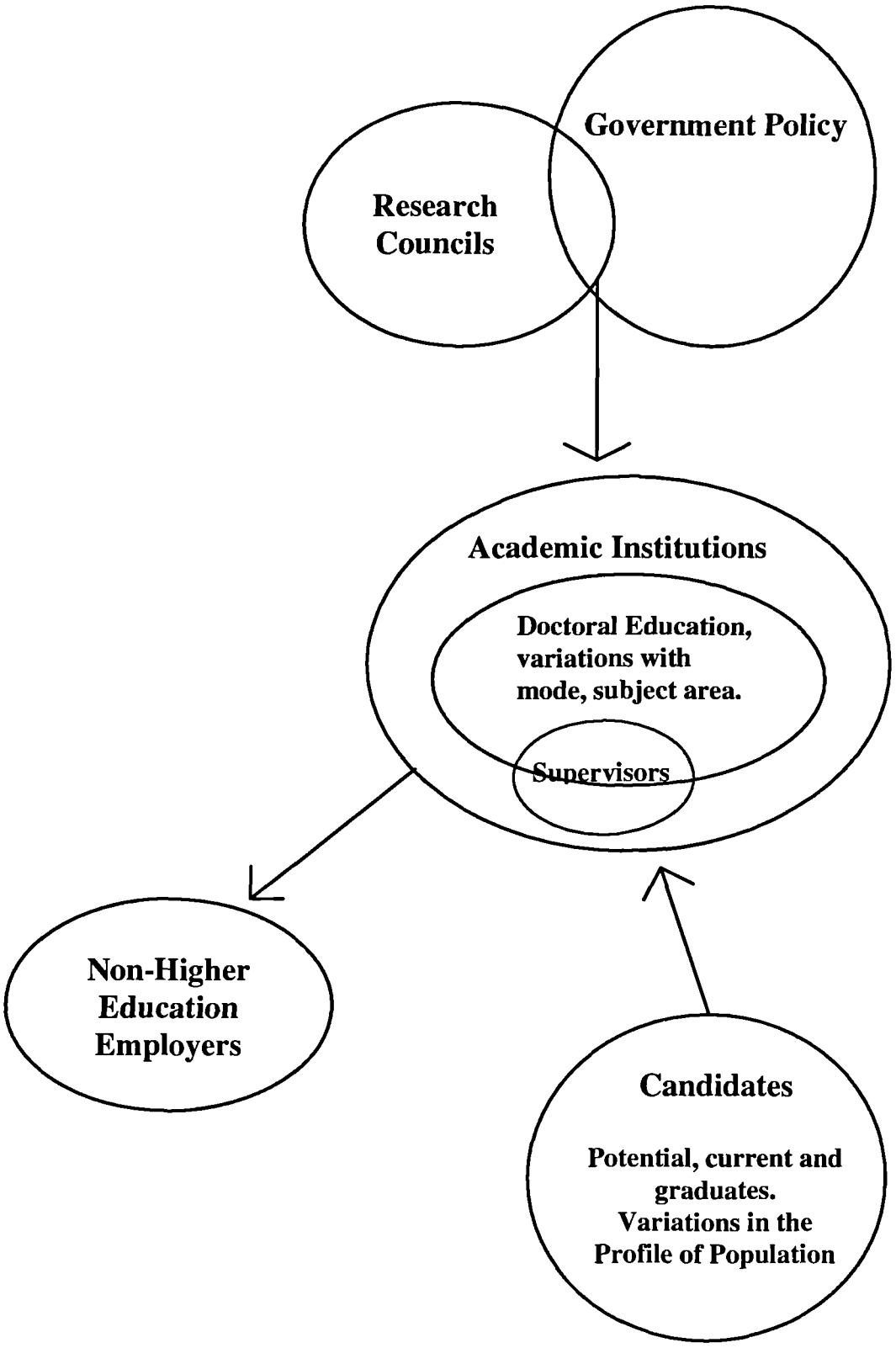
The Ideological Dimension

A combined methodological approach has been adopted to investigate perspectives on doctorates. The different components within this research could be accessed most effectively by using elements of ethnography, case study and survey approaches, encapsulated within a SSM framework. This offered coherence and provided the overarching direction of the research. The notion of problem solving is central to SSM, as is the recognition that problem situations are perceived differently by different stakeholders. The problem that this research is seeking to address, is the lack of awareness about the growing complexity of doctoral provision and need. In

particular this research focuses on the insufficient understanding of candidates' perspectives. This research aims to enrich the picture of doctoral candidates and Rich Picture 1 on the following page, gives a starting point for understanding to be added to throughout the course of this thesis. Chapter 2 begins to explore the context surrounding doctorates by discussing relevant literature.

Rich Picture 1:Starting the Picture of Doctorates

This picture, prior to data collection, was the starting point on which understanding was added to.



Chapter 2 The Literary Framework

Introduction

An increasing amount of concern over British postgraduate education has been expressed in academic and popular literature over the last fifteen years: primarily about quality and standards. Most of the attention in this chapter is focused on issues relating to the British doctoral system although international developments in thinking and practice are acknowledged. An understanding of the ideologies of the key interested parties and their vested concerns in doctoral study can be obtained by studying four main components of doctorates: the purposes, processes, products and protocols.

This chapter introduces some of the key themes for discussion that have been identified from relevant sources of literature. These issues are integrated and a holistic approach must be adopted to reflect their complexity rather than employing a bi-polar procedure which is static. As previously discussed in Chapter 1, SSM provides the total methodological focus for this research because it recognises the complexity of real-world situations, and that a series of relationships exist between each of the following issues.

From the literature it would appear that it is the 'quality and standards' of doctoral education that is the 'problem situation' but this is perceived in different ways by all the interested parties. It is crucial for the methods employed that these different perceptions are considered throughout the project.

Quality and Standards

Literature expressing concern over questions of quality and standards has come from three main sources; the government and their Research Councils (major sponsors of research); the academic community (recruiters of doctoral graduates); employers in public and private sector industry. The documentation provided by each of these sources focuses on and emphasises different concerns.

A number of explanations can be identified for this increasing attention to quality and standards. Considerable structural change from elite to mass education has prompted widespread discussion (Blume 1995). The rapid increase and changing profile of students participating in higher education has had a profound affect on institutional resources (HEFCE, CVCP, SCOP 1996) and has questioned the role of the university (Baty 1997). Extensive debate from all the above parties has occurred over undergraduate education and the abilities and employability of graduates has been questioned. All three parties are now extending such discussions to postgraduate studies.

Literature from the government and Research Councils during the 1980s was fundamental in prompting debate. The CVCP report in 1986, 'Academic Standards in Universities' (The Reynolds Report), and the Winfield enquiry (1987) into submission rates subsequently led to discussion by the academic community. The 1996 Review of Postgraduate Education (The Harris Report) noted the increase in UK postgraduates from 25,700 in 1961-62 as reported in the Robbins report of 1963, to 315,400 in 1994-95 (3.13). The review associates the increasing concern over quality and standards with this growth. The National Committee of Inquiry into Higher Education in 1997 in particular signifies the political profile that postgraduate education has recently attracted and the level of attention being paid to quality and standards.

Literature from the academic community has largely been preoccupied with the quality of supervision (Hockey 1997) and standard of the viva voce (Nightingale 1984). Concern has also been expressed over the quality of skills that are being developed in doctoral students (Murray and Lowe 1995; Casanave and Hubbard 1992).

Literature from employers has questioned the employability of PhD graduates and the relevance of doctoral education outside academia (Gold 1988). Increasing acknowledgement that research students can make contributions to the finance,

research (HEFCE et al. 1996) and status of an institution is resulting in more attention being paid to completion rates and the experiences and processes of a doctorate. Finally (though this is relatively sparse) academic literature suggests that the introduction of professional doctorates in the early 1990s has begun to exacerbate these concerns over quality and standards (Gregory 1997). These publications recognise that a new population have been introduced to this level of study, but that professional doctorates raise questions about what constitutes relevant doctoral education. Issues about the form that the thesis takes and 'practice-based doctorates' have also been raised (UKCGE 1997).

Attention to the quality and standards of doctoral education has also appeared in American academic literature (Ziolkowski 1990a). Kreeger (1995) discusses the National Research Council report 'Research-doctorate programs in the United States: continuity and change', which examined the quality and effectiveness of doctorates at 274 universities (p3). Other literature acknowledges growing concern over the last forty years in both Britain and America and highlights the specific focus on the structure of American doctorates. This interested party also indicates that students themselves are demanding more 'value for money' as the monetarisation of education increasingly becomes more dependant on them (Tight 1992). Literature from the OECD identifies increasing concern with doctoral education in a number of Member countries (1987). It is evident that similar concerns over the purposes, processes, products and protocols of doctoral education are exhibited internationally, although the emphasis on issues varies.

These changes in doctoral education are prompting the increasing concern over quality and standards from the three interested parties. The above debates are expanded upon in the following four sections where issues surrounding quality and standards are paramount. The complexity of these terms is acknowledged and discussed towards the end of this chapter.

Doctoral Purposes

Literature on doctoral purposes has come from the academic community and the Research Councils. Both parties undoubtedly regard the PhD as an apprenticeship for an academic career; the Harris Review (1996) indicated that postgraduate research education is the principal vehicle for training teachers in higher education. However, Noble (1994) acknowledges that this was not always the case as the PhD was formerly 'bestowed on those considered to be at their intellectual peak' (p10). Throughout the 1990s this has resulted in considerable attention to the PhD structure in order that an adequate academic preparation is provided. The ESRC has been particularly vocal on this issue resulting in the introduction of their first set of training guidelines in 1991 and again in 1996.

In contrast some academic publications discuss changing purposes of candidates who are undertaking a PhD. These claim that more people are pursuing PhDs to enhance their career prospects outside of academia (Thomson 1996). This corresponds with publications recognising that professional doctorates are not intended to have the same purpose as the PhD as these programmes are more concerned with enhancing professional practice within the associated working environment (Myers 1996).

Academia has also expressed concern over the originality of work. Still unanimously held as the university standard for a doctorate, this concept has attracted recent attention (Cowen 1997). Some academics are concerned that originality is being lost in the modern PhD as more doctoral students become engaged in research. These debates featured prominently in an American publication by the Council of Graduate Schools which discussed the difficulty in defining originality and significance and the role and definition of independence (CGS 1991).

Some American literature from the academic community questions the relationship of the PhD to an academic career. It asks if a PhD really provides an appropriate training, particularly as there is often no exposure to teaching practice. This publication goes on to stress the need for a more flexible approach to be adopted if

the PhD is to remain an academic apprenticeship (Ziolkowski 1990b). American doctoral programmes on international business are criticised as only being single discipline based and nationally orientated as this would not equip future researchers with the knowledge and experience they need (Kuhne 1990). Discussion about the appropriateness of a PhD is also raised by OECD literature which suggests that a different experience should exist for those intending to pursue non-academic research (OECD 1995).

Some American literature touches on the purposes of an EdD in relation to the PhD and questions the distinction, but largely focuses on admissions procedures and types of applicants (Andersen 1983). However, literature from the Australian academic community extends this comparison and one publication argues that the context of research should be central for a programme to be a 'professional' doctorate, 'the specificity of knowledge in context is central to the reconceptualisation of the professional doctorate' (Maxwell and Shanahan 1997, p148). Other Australian publications examine the relationship of professional doctorates to the PhD, one focusing specifically on the field of management (Perry and Zuber-Skerritt 1994).

In summary, discussion on British doctoral purposes comes from academia and the Research Councils. Literature from these sources firmly accepts that a PhD exists as a training for a research career. This subject receives most of the attention and the other debates are subsumed within this discussion, consequently receiving relatively little exploration. International literature comes from the academic community and also raises the purpose of a PhD as preparation for an academic career. However, this body of literature pays significantly more attention to the purposes of professional doctorates and their relationship to the PhD.

Doctoral Processes

Literature on doctoral processes has come from all three interested parties. In the last ten years attention has been focused on the ways of working and the development of transferable skills within a PhD.

Literature from the ESRC in the early 1990's discussed employers' poor perception of social science graduates. ESRC training guidelines aimed at improving the transferable skills of research students in order that their career options may be broadened. 'Not all research postgraduates wish or will be able to pursue a career in academic research, nor might they be able, whatever their career patterns, to pursue research solely related to the specialised topic of a thesis' (ESRC 1996, p10). The Government's 1993 Science and Technology White Paper aimed at making the PhD a structured training programme and more responsive to industry. The introduction of CASE awards by the Research Councils shows increasing collaboration between industry and academia and highlights the differences of a collaborative programme, 'CASE allows the traditional teaching strengths of universities to take place in the context of a research area of direct interest to a collaborating organisation with a training input from the collaborating organisation itself'(Bell and Read 1998, p7).

The National Committee of Inquiry into Higher Education in 1997 reported the value of key skills at all educational levels. Chapter 11 'Supporting research and scholarship', highlighted the fourth purpose of research as being the training of future researchers. Paragraph 11.84 stressed the development of 'professional skills'; "professional skills include the ability to operate effectively in a commercial environment, to be able to communicate ideas in writing and orally to a variety of audiences, to work effectively in teams as well as independently, and to develop high level planning and self-management skills' (p182). This development was seen as so important that Recommendation 31 stated that over the next 2 years postgraduate research training should be revised to include professional skills as well as technical and research training.

Academic literature endorses the above concerns over transferable skills (Daniels and Akehurst 1995). Some publications describe how vice-chancellors are pushing for the inclusion of taught courses within a PhD in an attempt to increase submission rates and respond to changing demands from the Research Councils. Professor Ash, former rector of Imperial College stated that 'the inclusion of taught elements in doctoral programmes will improve the quality of the thesis, promote in-depth study

of topics related to the thesis, and broaden knowledge of the discipline' (Williams 1988). Attention has also been paid to the quality and process of supervision (Phillips 1980; Hockey 1997), and research students' writing skills (Lowe and Murray 1995). Academic concern has arisen over the structuring of PhD programmes and caution has been expressed over such changes (Renouf 1989; Walsh and Mills 1994).

Some academic literature raises the subject of peer learning in relation to professional doctorates (Hall 1996; Myers 1996). It is noted that the ways of working are a key characteristic that distinguishes the professional doctorates from the PhD. The marketing of these programmes show that attention has been paid to interactive learning and peer support. This is offered by some institutions as an attempt to mirror professional practice and rid of the notion of lonely scholarship. This isolated experience certainly in the social sciences, is particularly recognised in literature from the late 1990s. Suggestions for more group-orientated supervision (Renouf 1989) and discussion about Graduate Schools (Stead 1997) recognise the sense of community that these initiatives build and the implications for transferable skills.

Concerns about ways of working and transferable skills feature in literature from non-academic employers. They express concern over the lack of team-working within the PhD and highlight the consistent need for individuals to be effective team-players at all levels of recruitment. This is not sufficiently exhibited at doctoral level and is noted as a particular problem with social science graduates who have an unidentifiable recruitment pattern outside of higher education (Pearson, Seccombe, Pike and Connor 1993), (the employability of doctoral graduates will be explored in the next section).

International discussion on doctoral processes has come from both American and Australian academic literature. The structure of PhDs has received Australian attention and one publication argues for the need to broaden the intellectual base of PhDs by introducing coursework and offsetting premature specialisation (Stranks

1984). This was a response similar to British concerns by non-academic employers over PhD employability.

The writing problems of doctoral students (Casanave and Hubbard 1992) and completion times and their relation to programme characteristics are issues in American literature. One publication identified growing concern between 1977 and 1987 and concluded that poor completion rates were due to lack of supervision and poor support (Baird 1990). This also attracts Australian attention (Green and Bauer 1995) and this publication explores the relationship between student productivity and aspects of supervision. Some American and Australian literature (Holdaway 1996) dealt with the processes of professional doctorates, where comparisons between the EdD and PhD examined the nature of coursework requirements in each programme type, "the majority of PhD programs required coursework outside of Education (56.6%), while EdD programs less often imposed such a requirement (44.6%)" (Andersen 1983).

In summary, the discussion on doctoral processes has focused on ways of working, specifically team-working. Government and Research Councils' attention is based largely on the need for structured research training in response to calls for improved transferable skills of PhD graduates. Similarly, the body of literature from the academic community is also concerned with transferable skill development and with strategies to build them into the PhD processes. The small amount of literature from non-academic employers stresses the lack of team-working within a PhD as being problematic in graduate recruitment. Attention has therefore been focused on the curriculum in relation to the employability of doctoral graduates. International attention has also discussed the introduction of coursework and the structure of the PhD, and completion rates have likewise featured prominently. There is considerably more international attention on the professional doctorates and more comparisons between the PhD and the EdD.

Doctoral Products

Both the skills and abilities of graduates and the tangible product of the doctoral process have attracted attention from all the interested parties. Literature from the Government and Research Councils address the title of the product and the 1996 Harris Report called for a nationally coherent framework of graduate education to clarify typology and nomenclature. The HEQC Graduate Standards Programme in 1997 surveyed awards in eleven universities and endorsed this need for comparability of doctoral titles, 'the project found support for clarification of the criteria for different kinds of doctoral degrees, 'in order to avoid the confusion that has arisen at master's level'' (HEQC 1997, p34).

All three parties have acknowledged the variation in recruitment patterns of doctoral graduates according to different disciplines. The majority of humanities and social science PhD graduates enter some form of higher education employment but an unclear pattern exists for other destinations. Academic literature indicates that few employers positively recruit doctoral level social scientists outside of higher education (Pearson, Seccombe, Pike, and Connor 1993) and it is suggested that PhDs from these disciplines are only considered alongside Masters, 'the labour market for doctoral social scientists is extremely small and fragmented, and inexorably linked with the labour market for first degrees and masters level graduates' (Connor 1994, p169). Academic literature identifies clearer recruitment trends of PhD graduates from engineering and the natural sciences showing that many embark on research and teaching roles in higher education, but some are positively recruited as industrial researchers (Ellis 1993).

Academic literature has expressed concern over the role and standard of the viva. The considerable variety in procedures and expectations of students and supervisors is prompting debate (Barwise 1998). Academic literature has also acknowledged 'practice-based doctorates' (UKCGE 1997). Although the award of PhD is still the outcome, the product is invariably an artefact accompanied by a written critique. These are recognised primarily as being the result of an Arts and/or Design doctorate.

Debates about the nature of doctoral products and theses are raised within American academic literature (CGS 1991). The rapid increase in doctoral graduates and changing recruitment patterns is documented and one publication claimed that more graduates existed than academic positions could fill (Wolfe and Kidd 1971). More recent American literature continues this theme and acknowledges graduates as an important feature of the non-academic workforce (Massen and Bergman 1993). OECD literature commented on variations in employer attitudes to doctoral graduates and that attention to transferable skills was essential if they were to reach a broader market (Blume 1995). One American publication endorsed this by arguing that the skills developed during a PhD are just as transferable to non-academic employment (Casey 1986).

The issue of transferable skills is discussed in Australian literature which suggests the need to increase the commercial marketability of graduates. One publication claims that skills needed for both academic and non-academic employment are not produced by doctoral education (Stranks 1984, p10), while an examination of graduates and employers stresses the need for them to recognise the generic transferable capabilities exhibited by PhDs (Sekhon 1989). Literature from this interested party also discusses the thesis and is concerned about the criteria for assessment (Nightingale 1984).

Some American literature is devoted to the discussion of professional doctoral products. Content analysis of EdD and PhD dissertations highlights the similarities and differences and a study of the employment patterns of EdD and PhD graduates found that more EdDs followed educational practitioner routes than enter academia (Nelson and Coorough 1983).

In summary, discussion on British doctoral products comes from all interested parties and examines both the tangible outcome and the transferable skills of the graduate. Employers show concern with the lack of teamworking and the particularly poor transferable skills of social scientists. There is academic concern with the viva

and thesis and these concerns are endorsed by international literature. Transferable skills also feature prominently from the Australian academic community.

Summary of Discussion and Omissions

Literature examining the quality and standards of doctoral purposes, processes and products has been discussed and shows that most of the attention has focused on the latter two categories. Virtually all of the literature is concerned with the current doctoral situation and this has been expressed by all interested parties. The purposes are discussed by the academic community and the Research Councils and their attention mainly focuses on the PhD as an academic apprenticeship. The processes are also dominated by literature from these two parties and address the need for structured PhD training. 'Doctoral products' is the only category to receive substantial attention from non-academic employers who discuss the transferable skills and employability of graduates as do academia and the Research Councils. International literature has mainly come from America and Australia and is confined to the academic community. This discussion reiterates many of the debates in the British literature but more comparisons are made between the PhD and EdD. To conclude, the most frequently discussed issues centre upon structuring the PhD to develop transferable skills and promote effective research training. This bridges both the processes and products categories. The interested parties vary in their emphases but literature from the academic community is the most abundant.

Several issues can be identified which none of the interested parties address at length. The words quality and standards are frequently interchanged but little debate exists over precisely what standards are appropriate for this level. Minimal consideration is given to their exact meanings in relation to doctorates.

There is a lack of debate about the purpose and function of a thesis. It would appear that making an 'original contribution to knowledge' is being subsumed by the need for effective research training, although this is not explicit in the literature. It is not clear what function professional doctorates fulfil and how they relate to the PhD. There is little exploration of the philosophical differences between these

programmes and questions about equivalence and difference are relatively unexplored. British literature concerned with doctoral processes assumes that the PhD is the best way to train future researchers, but it does not explain how and why this is the case. Although literature highlights the need for doctoral graduates to be effective team-players, the means by which an individual can be equipped with this skill is not discussed.

There is a lack of discussion about the generic products of a doctorate. Although practice-based doctorates are acknowledged, essential outcomes common to all doctorates are not identified. Similarly, even though transferable skills attract attention, 'doctorateness' or doctoral capability is not fully explored. What capabilities should be common to all graduates and what should be subject specific ? Should candidates who undertake professional doctorates exhibit different capabilities from those who have undertaken a PhD ? These questions, although touched upon in debates about doctoral employability, are not discussed in detail.

In addition to the aforementioned matters, there are a number of broader omissions. A paucity of books on the subject of doctorates is noticeable and most of the discussion is confined to journals. Books that do exist tend to be in the form of manuals or guides e.g.; 'How to get a PhD' (Phillips and Pugh 1987), 'The Research Student's Guide to Success' (Cryer 1996). This is perhaps indicative of the weight of the literature and where the interest is perceived to lie. There is a lack of cross-disciplinary discussion with most attention focused within one specific academic discipline or subject area.

This study predominantly reflects work from the UK, Australia and America. While some literature exists from the OECD, there is little international discussion outside of America and Australia. While neither an exhaustive historical nor European study has been undertaken, it has been noticed that surprisingly minimal interest exists from Germany, given that the doctorate has origins there. Discussion about professional doctorates is more prolific in Australia and America than the UK, but comparative work mentioned earlier in this chapter focuses only on the EdD. There

is a general lack of comparison in contemporary literature between professional doctorates and PhDs, and between different types of professional doctorates.

Some government publications discuss issues which relate broadly to all Research Councils but there is little relevant material from Councils other than the ESRC and MRC. Even though there is plenty of discussion about research students from all the interested parties, students themselves are not explicitly vocal and their views are inadequately represented and discussed.

However, there are some exceptions to these generalisations, and two texts in particular must be noted. Firstly Noble's book (1994) 'Changing doctoral degrees' considers broad international doctoral trends and future patterns. Secondly, Clark's book (1993) 'The research foundations of graduate education' offers an international comparison. However, these publications are not the rule and the majority of the literature shows two striking omissions which are interconnected. First while there is overwhelming concern for the present needs of and for doctoral education, there is a significant lack of foresight and imagination about what future requirements for doctorates might be and what doctorates might look like. Second is the lack of discussion by all interested parties about the philosophical and epistemological underpinnings to doctoral study. The majority of publications are primarily concerned with structures and procedures, that is the issue of protocols.

Doctoral Protocols

Literature examining British doctorates has primarily been concerned with educational protocols and there has been little discussion of doctoral philosophy. The vast majority of literature from all interested parties express concern over doctoral education and discuss this in the language of 'quality' and 'standards'.

The UK Council for Graduate Education (a key text for this area is; 'Quality and Standards of Postgraduate Research Degrees' (1996)) describe the variety of definitions of quality and acknowledge that 'fitness for purpose' is commonly accepted in higher education. Shaw and Green (1996) highlight the distinction

between quality, quality assurance and standards but Lindsay's discussion of quality is particularly worth exploring in this context (another key text is Lindsay's 'Concepts of Quality in Higher Education' (1992)). He identifies two fundamental views of quality that emerge from the variety of different meanings. The first view; 'production-measurement' regards quality as a 'synonym for performance' (p154) and is associated with defining and measuring resources and outcomes. His second view is the 'stakeholder-judgement' where quality is a means of emphasising the 'imponderable elements of our conceptions of educational processes and outcomes' (p154). This view is dependent on valuing the perceptions of the interested parties and is less concerned with 'quantitative measures of performance'.

Most of the literature adopts the 'production-measurement' view of quality. This results in 'quality' and 'standards' being closely aligned, (if Green and Shaws' definition of standards is to be accepted; ' the weight or measure to which others conform or by which the accuracy of others is judged' (1997)). This is evident from the literature where the two words are used interchangeably. By adopting this view of quality, discussion is invariably drawn towards the protocols of doctoral education and to what is quantifiable. Literature from the Government and Research Councils focuses heavily on the need for training and structure within the PhD. As already noted, the ESRC training guidelines have obviously triggered interest in transferable skills and reinforced attention on submission rates.

Literature from the academic community is also concerned with the protocols of doctorates and focuses on many of the same issues. Providing training and structure in the PhD also attracts attention, especially the social science experience. The organisation and administration of Graduate Schools (UKCGE 1995) and the quality of doctoral supervision is prominent. The standard of the viva and thesis are areas of concern as are the transferable skills and employability of graduates. Therefore whilst literature has come from all interested parties and has expressed concern over the quality and standards of the purposes, processes and products of doctoral education, attention has been largely based on the protocols.

The UK Council for Graduate Education acknowledges that attention to doctorates, institutionally and from external bodies is a relatively new subject as is the requirement for details of performance. But as Lindsay suggests, over quantifying performance detracts from the equally important aspects that are less tangible and cannot be discussed in language of effectiveness and efficiency. This is clearly at the heart of his 'stakeholder-judgement' view of quality which embraces a more qualitative perspective. Intrinsic to this is the belief that the views of all interested parties are a crucial part in assessing educational quality and this is not apparent from the literature.

If quality as 'fitness for purpose' is accepted (and this corresponds with Lindsay's analysis), the literature shows a clear disparity between what each interested party perceives as the purpose of doctoral education. For example, earlier discussion identified that more people are undertaking doctoral study to enhance their career prospects outside of academia. This groups' perception of the programme's fitness for purpose may be very different from that of those who intend that a doctorate will launch an academic career or of those wanting to use it as the culmination of a lifetime's work. These possible student perspectives are likely to differ from the academic community's perception of fitness for purpose and again with the Government's and Research Councils' view. This highlights the complex nature of 'quality' and shows how important it is to consider all vested interests. As Lindsay says, quality is not a 'unitary or un-problematic concept' (p161) and cannot simply be dealt with by the development of procedures.

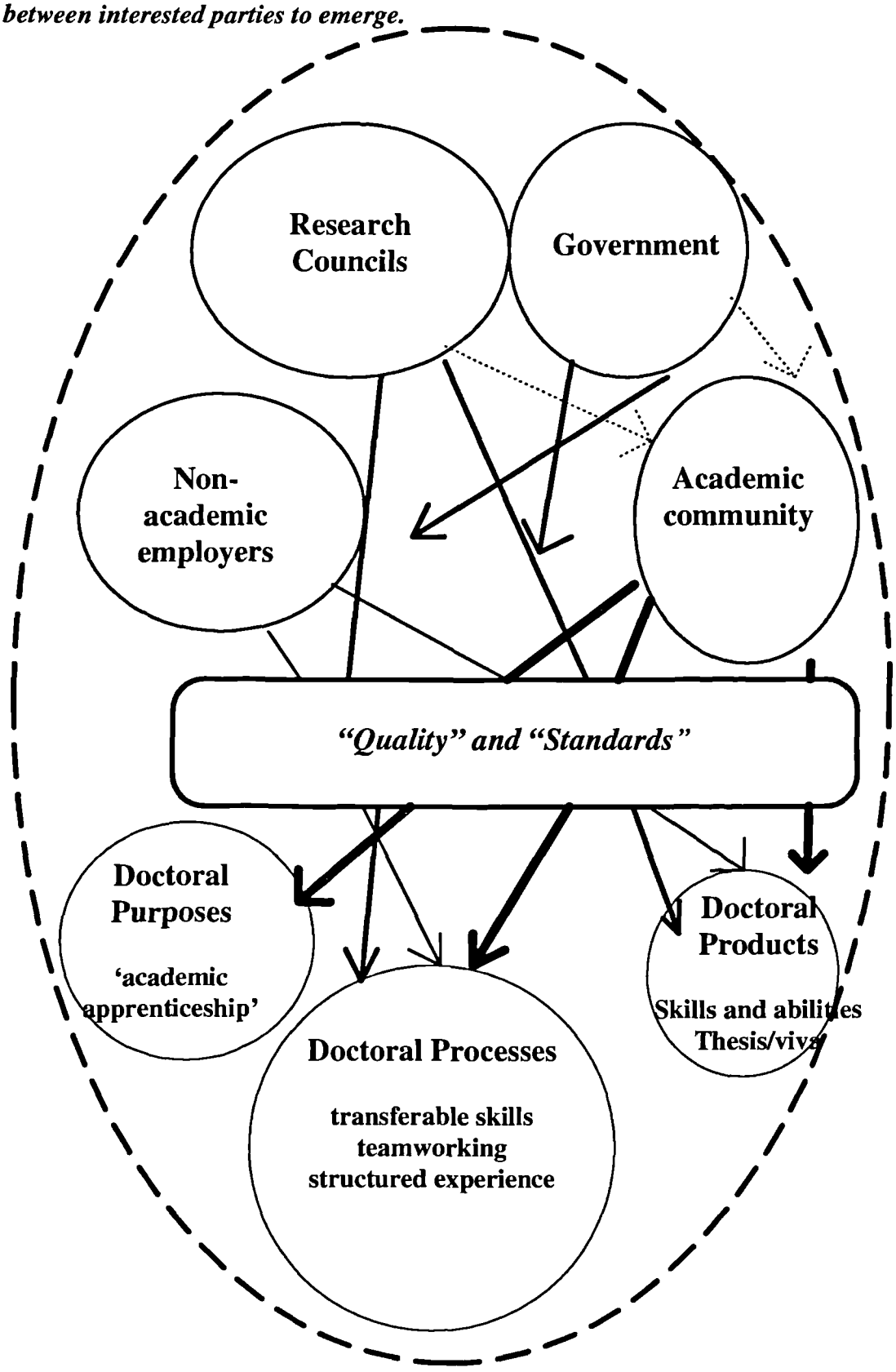
Not only is there divergence of views about different types of doctorates but the subject or their contribution to fitness for purpose is hardly discussed. Comparative work examining EdDs and PhDs largely focus on the procedures of admissions and assessment and fails to grapple with broader philosophical debates. This corresponds with the lack of vision and creativity from all the interested parties in considering what future doctorates could and should look like. A static view has resulted which has become overly concerned with the mechanics and logistics of doctoral education.

This review of contemporary literature has revealed that three of the main 'P's'; purpose, process and product have been inadequately addressed. This has resulted in an over-emphasis on doctoral protocols, particularly from Lindsay's 'production-measurement' perspective. The main omission concerning doctoral purposes was from Research Councils other than the ESRC, from research students and from non-academic employers. In particular, the generic purposes of professional doctorates and their relationship to the PhD was unexplored. Doctoral processes lacked attention from the same interested parties. Little is said about what should be included in a professional doctorate and PhD programme in relation to their respective purposes. There was also a clear assumption that the PhD is the best way to train researchers but little debate exists as to how and why this should be the case. Although ways of working featured prominently, who was being collaborated with and in what form was not clearly identified. Literature examining doctoral products failed to debate the concept of doctoral capability or 'doctorateness', either generically or in specific relation to different types of programmes. Finally the attention given to doctoral protocols did not result in consideration of the 'stakeholders-judgement' view. This is a particularly significant feature of the entire exploration because the interested parties varied in their prominence.

Rich Picture 2 on page 47 begins to fill out our understanding of doctorates in light of the literature. It is now possible to undertake fieldwork which will clarify understanding further and give a fuller and more balanced view. The first stage is to contextualise the fieldwork and a description of the institutional case studies follows.

Rich Picture 2: Understanding Literature on Doctorates

Fundamental to building a picture of doctorates is the examination of relevant literature. The methodological architecture enabled the complex interaction between interested parties to emerge.



Chapter 3 The Institutional Infrastructure

Introduction

In order to contextualise the opinions of the interested parties discussed in Part 2, it is important to understand something about the main institutions that provided the sample groups. This research focuses on four institutions, all of which are different and contribute something unique to the understanding of doctoral perspectives. This chapter aims to explore the differences and similarities that exist between doctoral programmes in particular Schools and Departments of Middlesex University, Imperial College of Science, Technology and Medicine, the National Institute for Medical Research and Bristol University. The structure of this chapter follows the theme of purpose, process, product and protocols (the latter form the basis for the discussion on processes) that are used in Chapter 2, but also describes the institutional population and that of the relevant doctoral programmes. This gives a profile of the staff and students, an outline of the institutions' research focus and aims of the doctorates, the doctoral structures and experiences, and the anticipated outcome of the programmes. This provides a necessary backdrop to detailed analyses of stakeholders' perspectives in Part 2. Each of the four institutions is discussed in turn, providing a platform from which some general observations and conclusions can be made at the end of the chapter.

Literature discussed previously in Chapter 2 paid attention to the variations in structures and experiences of PhD students working in different subject areas. Contrasts were made between the PhD process in the social sciences or humanities with that of the natural sciences (see page 37). Selecting case studies to offer an insight into these dissimilarities was felt to be relevant to this research. As perspectives on doctorates are being examined, views from those involved in different kinds of programmes should show some of the variety of experiences and opinions. This accounts for the choice of the following case studies discussed within this chapter.

Middlesex University was clearly the home of this research and offered two important features. Firstly the DProf gave a perspective on a new and distinctive professional doctorate. Secondly the significant numbers of PhD students active in the social sciences provided a good base to obtain some perspectives from this subject area. Middlesex University does not offer PhD programmes in the natural sciences, so another institution was needed to examine the views of those with a different subject experience. The selection of the Biochemistry Department at Imperial College provided a contrasting institution to Middlesex and a pool of interested parties involved in an entirely different discipline. The National Institute for Medical Research offered an insight into a solely research orientated organisation, but its field of study provides a point of contact with Imperial College. Finally Bristol University provided the opinions and experiences of those involved in an established professional doctorate with graduates, in an old university environment. While clearly not exhaustive, these case studies provide a flavour of contrasting doctoral programmes, different subject areas and distinct institutional contexts.

Middlesex University

This is a new university situated throughout north London. The institution has seven principal campuses with a number of smaller additional sites, each housing different subject specialisms. A review of the Middlesex academic structure occurred in December 1996. The outcome of this was the reorganisation of the six Faculties and thirty Departments into nine Schools. This had an important impact on the sample groups taken from Middlesex. Initially the Faculty of Social Science and Education was chosen and questionnaires were administered. However as a result of the restructuring this subsequently became the School of Social Science and the School of Lifelong Learning and Education during the stages of data collection. This meant that while the questionnaires (discussed in Chapter 1) were targeted at the population of one Faculty, the follow-up interviews were conducted within two Schools. This may have resulted in different contextual experiences and opinions expressed by the participants, but was unavoidable.

The National Centre for Work Based Learning Partnerships is now located within the School of Lifelong Learning and Education following the restructuring, although the activities are becoming firmly embedded throughout the institution. Work based learning aims to acknowledge and interpret the skills, experience and knowledge acquired through work into academic qualifications. Awards range from a University Certificate through to the Masters and Doctorate in Professional Studies programme. Although NCWBLP is the managing agency for the MProf/DProf, this too is a pan-institutional development.

The University offers three types of research degree; the conventional MPhil/PhD; an EngD and the MProf/DProf described above. As there have never been any graduates from the EngD and only one student is currently enrolled on the programme, this was not included in the sample.

Population

Middlesex University is one of the largest in the country and currently attracts in the region of 30,000 students. Approximately 3,000 of these are postgraduates, the majority classified as 'mature' and an overwhelming proportion of these study part-time. The profile of the research students also reflects this balance, 85 of whom study on a full-time basis, and 217 part-time. Currently the School of Social Science has close to 100 registered for an MPhil/PhD. While an increasing number study full-time, the majority are part-time students. The School of Lifelong Learning and Education has approximately 45 research students and again the majority study part-time. Most of these students fund themselves which probably explains why they study on a part-time basis. For some, this mode is clearly an opportunity to earn the necessary fees and expenses required during a doctorate. In addition to this there are 31 UK candidates on the MProf/DProf, all of whom are registered as part-time. This programme is explicitly targeted at 'high-level executives' or 'senior professionals and managers', which inevitably means that they will be mature students. These tend to be either self or employer funded, or in some cases a combination of the two. Candidates are recruited who have a high level of professional experience and an initial intensive interview ensures the authority and professionalism of the applicant.

Purpose

Middlesex prides itself in being 'a pioneering centre for lifelong learning,' particularly at postgraduate level. The research activity is frequently developmental with many staff engaged in professional consultancy. The School of Social Sciences conducts research into a variety of fields associated with psychology, social work and health sciences, and sociology and social policy. The School of Lifelong Learning and Education attracts research into a diverse range of compulsory and post-compulsory education. The main interests centre on higher education, learner managed learning, technology and primary education, arts, language and learning and work based learning. This School received a rating of 3b in the 1996 RAE.

PhD research in these two Schools is reputed to be 'an exercise in intellectual exploration and development within which training in research techniques takes place'. This is made explicit to both students and supervisors by being included in a MPhil/PhD Handbook for use in both Schools. The purpose of the DProf is to offer an 'applied' alternative to a PhD and for candidates to 'focus on personal excellence and/or instigate major change within an organisation.' Again this is referenced in the University Catalogue and is also stressed within the recruitment and delivery of the programme. Clearly a qualitative difference exists between these two doctorates and this is important to stress in associated material and indeed during the programmes themselves. The recognition and development of professional capability is obviously central to this programme and something that was raised on page 36 in Chapter 2 in relation to the 1997 Dearing Report.

Process

The process of admission to a PhD programme in these two Schools requires the prospective student to have a good first degree as a minimum. They should also have designed a research proposal giving an indication of their research intentions. This appears slightly different from PhD application procedures in the natural sciences at Imperial and the NIMR. These tend to be recruited onto an existing project or are given a pre-defined project to undertake. The creation of the research is not

necessarily initiated by the student, something more expected of social science applicants.

No Graduate School exists either institutionally or on a level particular to the Schools of Social Science and Lifelong Learning and Education. Nevertheless students doing a PhD in either of these two Schools are required to undertake some kind of formal research training. The School of Social Science has a postgraduate research training programme that is compulsory for all first year students. It is intended to provide an advanced level training in specific research skills and can lead to the award of a Postgraduate Certificate or Diploma in Research Methods. The research students in the School of Lifelong Learning and Education are expected to attend the research methods module within the Masters in Lifelong Learning, but can also attend the postgraduate research training programme in the School of Social Science. In addition, the School of Lifelong Learning and Education offers a number of workshops and seminars throughout each academic year.

A work based research methods component is structured into the DProf programme and candidates who are not considered as already having the appropriate research knowledge are expected to undertake it. This programme does not overlap in structural terms with the experiences of the PhD students described above. The remaining DProf programme is systematically and experientially different from the PhD, and deliberately so. There may be more regular and consistent contact with fellow students on the DProf than on these PhD programmes. The structure of the DProf supervision is also slightly different that may affect the student experience. All DProf students are allocated an adviser to oversee them throughout their entire programme. In addition a consultant or consultants provide specialist input normally when the candidate has reached the research project stage. This team of support varies slightly from the Director of Studies and supervisor who together see the PhD student throughout the duration of their doctorate. Potentially there appears to be more scope for formally using a broader team of advisers on the DProf programme than is currently practised within the PhD structure. Clearly this has both advantages and disadvantages for all involved. However this larger team is intended to reflect

the professional expertise of the DProf candidate and also the more collaborative nature of working in a professional context.

Product

The essence of the Middlesex University standard for the award of PhD is someone who has 'critically evaluated an approved topic resulting in an original contribution to scholarship, worthy of publication in complete or abridged form'. The award of DProf is given to someone who has 'engaged in advanced learning from taught or project sources which achieves major organisational change and/or excellence in professional practice resulting in original work worthy of publication in complete and abridged form.' This difference is expected to reflect the distinct nature of these two programmes and to highlight that the standard of the DProf is equal in some ways to the PhD, but contextually different.

The product of a Middlesex PhD follows convention and requires a viva voce in addition to the submission of a thesis. The DProf potentially provides scope for candidates to be more creative with the nature of their final product. The ethos of the programme would support material being presented in book or report form providing that the standard was met and the work was critically evaluated. There is some variation in the length of these documents depending on the doctorate undertaken. A PhD in either social science or education has a maximum word length of 80,000 whereas the outcome of the DProf may be slightly less, around 65,000 words. The DProf involves the 'presentation of a major project' and an oral examination. This appears at face value to be no different from the PhD structure. However, this could include an open and professionally targeted presentation to a larger audience than used for a PhD. Clearly there are professional ethical, moral and legal considerations that must be adhered to, but this practice could have far-reaching ramifications for the dissemination and justification of professional doctoral knowledge.

Imperial College of Science, Technology and Medicine

Founded in 1907, Imperial College is an 'independent constituent part of the University' (of London), that is the largest university in the country for full-time students. The College comprises five central London sites with the main campus at South Kensington plus two additional sites in Berkshire and Wales.

The total income from research supported at Imperial is reported to be in the region of £135 million and much is said to involve industrial and governmental collaboration. The 1996 Research Assessment Exercise gave an overall weighted score of 6.09 (out of 7) with many departments scoring 5 and 5* ratings. The Department of Biochemistry was one of those to obtain a 5 rating in the last RAE. Formed in the early 1960s, quality research is considered central to the activity of the Department. This is sponsored through a combination of research councils, government agencies as well as commerce and industry. Charities and trusts are also significant contributors. The following give an insight into some of the key sponsors; the Biotechnology and Biological Sciences Research Council, the British Council, the Medical Research Council, the Commission of European Communities, Glaxo-Wellcome and SmithKline Beecham Pharmaceuticals and the Wellcome Trust. The MPhil/PhD is the only doctoral programme offered by both this Department and the College as a whole and no formal professional doctorate programmes are available.

Population

Figures from 1996-7 show that there were over 9000 students of whom a third were postgraduates. Just over 1,300 full-time research students throughout the whole College were recorded and approximately 420 studied on a part-time basis. On average there are 1,600 research workers (including research assistants and post-graduate research students) active and involved in research projects throughout Imperial College. The Department of Biochemistry is typical of others in the College and has in the region of 37 academic staff and research fellows who direct their own groups of researchers totalling approximately 160 employees within the department. There are currently 66 PhD students with 13 obtaining PhDs in 1998. The 1998/99 Annual Report shows that the majority of current students are either funded by the

Biotechnology and Biological Sciences Research Council or a Departmental Bursary. Very few are self funded which differs significantly from the student population in the two Middlesex Schools.

Purpose

The College conducts teaching and research throughout a range of management, medical, science and engineering subject areas and prides itself in having an international reputation. The Department of Biochemistry's strong research focus is channelled into many areas of biochemistry and biotechnology. It is divided into five broad departmental sections; Biomolecular Structure, Molecular Basis of Infection, Molecular Neurobiology, Photobioenergetics and Molecular Dynamics and finally Molecular Genetics. No purposes for PhD programmes in this Department were explicit in the relevant material so clearly students are expected to have a good understanding of what is entailed when they apply.

Process

General entrance requirements for admission onto a PhD programme at Imperial normally require the candidate to have the minimum of a good first degree. All candidates are initially registered for an MPhil and can apply after at least a year for transfer to a PhD. The majority of students appear to have just one supervisor allocated to them, but frequently use other post-doctoral researchers as technical advisers, rather than relying completely on their supervisor for guidance. This is clearly different from the process of supervision at Middlesex where the allocation of two per student is the norm. However, because the environment in which social science students are situated is often individual, it therefore makes it harder for them to rely on the experiences of others and as a consequence may lean more heavily on their supervisory team.

No Graduate School exists for PhD students in the Biochemistry Department at Imperial College. However there is a programme of study requiring them to give a number of presentations of their work at various stages and to various audiences.

They are also exposed to a departmental seminar programme of guest lectures. This is co-ordinated by a departmental Director of Postgraduate Studies.

Product

The outcome of a Biochemistry PhD follows the convention of the submission of a thesis plus an oral examination.

National Institute for Medical Research

The Medical Research Council (MRC) has a number of establishments of which the National Institute for Medical Research (NIMR) is the largest of two institutes. In addition to these there are a number of MRC units and interdisciplinary research centres. The MRC also provides financial support directly to universities. Overall the MRC 'employs 3500 staff in over 40 research establishments in the UK.' Research at the NIMR is primarily funded by the MRC 'within a total budget of £25m pa, which is set every five years following an Institute-wide review'. However, other sources such as medical charities, industry and commerce and the European Union also provide financial support for research. The NIMR was not included in the 1996 RAE, mainly because it is not an academic environment. However, assessment still occurs on two levels. The five-year review mentioned above requires a report outlining previous and prospective research achievements. This is externally refereed by peer scientists and the MRC's own research board. In addition, the Divisions within the NIMR are also examined every five years and a similar pattern of external assessment is held.

The location of the NIMR is on a single site in Mill Hill, North London, and was established in 1920. It only offers the conventional MPhil/PhD award with no professional doctorates available.

Population

At the NIMR there are over 200 MRC scientists in 18 divisions as well as approximately 100 post-doctoral fellows who are financed from other sources. Currently there are about 70 PhD students at the NIMR of whom the majority are

registered with University College London (UCL) and study on a full-time basis. The co-ordination of applications and admissions at the NIMR is the responsibility of a Director of Postgraduate Studies. The vast majority of these students are Research Council funded and virtually no-one supports themselves. Clearly this is more similar to the Imperial situation than to that at Middlesex.

Purpose

The Institute is solely responsible for research at postgraduate level and operates no educational programmes for undergraduates. This is important in relation to the ethos of the institution and for the way that the PhD programmes are conducted. Research students appear to be integral to the research activity which 'transcends the traditional compartmentalisation of science to which Universities are restricted, and allows a combination of techniques and approaches that would be difficult to achieve elsewhere.' The research is non-clinical and covers a broad range of medical fields that is organised into four areas within the institution; Genes and Cellular Controls, Infection and Immunity, Neurosciences, and Structural Biology. Students are expected to apply to work within available projects. The conception and design of their doctoral programme is therefore done within the overall framework of the project to which they are expected to contribute to.

The MRC provides the principal source of funding for the research activity. Those students who receive MRC bursaries appear comparatively well funded with additional allowances made for attending external meetings and conferences. 'Training is central to the mission of the Medical Research Council' and the bursaries available are clearly for that purpose. Evidently the MRC is expecting the next generation of their researchers to emerge from their investment and the careful structure of the PhD programmes described in the next section reflects this.

Process

As University College students, supervisory support is split between staff at UCL and the NIMR. Students are officially allocated one supervisor from each institution. The NIMR supervisor is expected to oversee directly the student's research project

while the responsibility for fulfilling academic requirements rests with the member of staff at UCL. All students are initially expected to register for an MPhil, transferring to PhD during their second year of study. This is achieved by students producing a 'mid-term progress report' that is examined by two members of staff, who are not directly associated with the research. Virtually all students appear to study on a full-time basis and are expected to complete within a four year period.

No Graduate School exists within the NIMR but students seem to follow a highly structured and collaborative programme of study. Their Director of Studies organises coursework that can range from attending a series of seminars focusing on research techniques, to courses on specific areas of interest to the field. A seminar programme is organised within each division which include presentations by both eminent external guests and research students. Students are expected to give a ten minute presentation of the outline of their research project after the first two months of registration. A twelve week study course is then timetabled where students attend the seminars and lectures described above. In the nine or tenth month students are required to give a presentation on a topic not directly related to their own research project. The second year of an MPhil/PhD programme has a similar structure. The mid-term progress report is required in order to transfer from MPhil to PhD and attendance at another study course is also built in to the experience. During the third year of study, students give a one hour talk on their research project, subsequently accompanied by another twelve week course. They are then expected to submit their theses within a total period of four years.

Product

Students from this institution are required to submit a thesis and have a viva voce in the standard way. However, the average length of the final thesis is considerably shorter than an equivalent in the Social Sciences or Education at Middlesex. A 50,000 word document is regarded as lengthy and one of 40,000 is perceived as the norm. Perhaps the style of writing and presentation is significantly different in the natural sciences making for a more succinct thesis. Maybe the nature of the research

requires the findings to be treated in a different fashion, leading to a document of equal standing but nevertheless characteristically different.

Bristol University

Bristol University was founded in 1876 as the University College Bristol. It has a split site structure and now consists of 60 Departments and 17 Research Centres organised into 6 Faculties. Research is claimed to be ' very well supported by the major Research Councils and Foundations and attracts considerable research funding from non-governmental and industrial sources.' The University offers the conventional MPhil/PhD route to a doctorate as well as the Doctor of Education programme. The Faculty of Social Sciences houses the Graduate School of Education where the Doctor of Education programme is situated. This School was awarded a grade 5 in the 1996 RAE and has a strong research orientation. The main areas of interest include psychology and language, management and policy, professional learning and development and assessment studies, all of which are structured into Research Centres.

Population

Bristol University has approximately 11,000 students, 2,000 of which are postgraduates and the institution employs in the region of 5,000 staff. The Graduate School has a large community of research students with approximately 60 registered for MPhil/PhDs and currently over 100 students on the EdD programme making it 'the largest programme of its sort.' The EdD is targeted at 'senior professionals in education' and is considered particularly appropriate for those 'involved in senior responsibilities for managing organisational change, learning and development.' These students follow a similar pattern of funding to those students doing the MProf/DProf at Middlesex University. Most are either self or employer funded or a mixture of the two. Professional doctoral research is likely to have relevant outcomes for the students' workplace, and may therefore gain the support of the employer. However students on programmes such as these have few funding options given that Research Councils do not actively support professional doctorates. Clearly

this accounts for many of them having to contribute personally to their own doctoral programmes.

Purpose

The EdD is 'Europe's first taught doctoral programme in Education' and has been running for six years. It is regarded as having the 'same status as a University of Bristol PhD.' The School's emphasis on research excellence is claimed to be mirrored by the EdD and the programme is closely associated with the focus of work conducted within the School as a whole. The entrance requirements differ slightly for prospective PhD and EdD students. PhD applicants are expected to have a good honours degree but those applying to the EdD programme are expected to have at least three years professional experience and an advanced educational qualification. Clearly an idea of the individuals' professional standing and practices relevant to the programme is required. Students register directly for an EdD with no intermediate award and no credit is given for other programmes or achievements that the applicant may have.

Process

The EdD programme requires students to complete twelve taught units resulting in 3-4000 word written assignments, plus a 30,000 word dissertation. The focus of the units offers the opportunity to 'develop a specialist understanding of a range of issues relating to educational management and learning in organisations.' There are four compulsory research methods units which are viewed as groundwork for the dissertation. The remaining eight units can be selected from a range of specialist areas. The minimum time possible for completion is three years and the programme is offered on a full and part-time basis. However, because of the professional nature of the programme, the research is more inclined to be integral to students' work activities. Most therefore study on a part-time basis and maintain total professional involvement.

On starting the EdD, students are allocated both an Academic Adviser and a Dissertation Adviser later in the programme. The programme boasts a diverse range

of senior professionals from around the world as one of its distinct features and stresses the value of learning and developing with other people. This principle is reflected in the requirement that students join one of the Research Centres described above depending on their preference. This collaborative dimension is also encouraged by the existence of the Graduate School which does not appear to be just an administrative exercise, but is actively used to develop a sense of community.

The system for supporting MPhil/PhD students appears more conventional as they are allocated a specialist adviser who is knowledgeable in the chosen field. Each PhD student has an individual Research Training Programme requiring attendance at a series of research methods courses, depending on individual needs. Seminars are also structured into PhD programmes and these operate on a School and Faculty level. This suggests that professional doctoral and PhD students are encouraged to collaborate on these occasions.

Product

The standard of the EdD dissertation is given in the prospectus as being 'a contribution to knowledge which shows evidence of originality and independent thought, critical evaluation of the appropriate literature, research skills and the ability to communicate the results and their implications in clear English. It is expected that the results of dissertations will be worthy of being, and in many cases will actually be, published.' (Doctor of Education prospectus, University of Bristol, p.10) A viva voce is also part of the examination process and uses both internal and external examiners. This overall method of assessment appears an almost identical process to that used for the award of PhD.

Conclusion

An examination of these four case studies has shown both similarities and differences at an institutional and programmatic level. For example, Middlesex is the only university to be a former polytechnic, the NIMR is the only institution to be situated on a single site and Bristol University is the only case study located outside London. Both Bristol and Middlesex are institutions offering professional doctorates

as well as the PhD and neither the NIMR nor Imperial College are awarding institutions in their own right.

These four case studies show general differences in the population of each institution and variations within the particular doctoral programmes. Middlesex has a significantly larger total student population than either of the other three institutions, but the number of postgraduate students is more comparable. Both Middlesex and Imperial have approximately 3,000 and Bristol has 2,000 postgraduates. The NIMR has significantly fewer with 70, but all of these are registered for MPhil/PhDs. Imperial has by far the greatest number of research students although the Department of Biochemistry contains only 50 of these. The Schools sampled at both Middlesex and Bristol share a similar number of research students from both PhD and professional doctoral programmes. These two institutions reveal another similarity as most students study on a part-time basis. This contrasts with the vast majority of PhD students at Imperial and the NIMR who study full-time. There appears to be a correlation between the students' sources of funding and their mode of study. The majority of full-time students are financed either by institutional bursaries or by a research council, whereas part-time students appear more likely to support themselves or be funded by their employer. The success of attracting research grants is likely to be greater for prestigious institutions, which in turn affects numbers of research students, most of whom would be studying full-time. This means that there must be considerable competition for studentships at the NIMR, given the relatively small number of research students and the prestige of the institution. However, funding and modes of study cannot be used as indicators of the prestige of professional doctorates because funding bodies do not currently support them.

Differences are also apparent in the purposes and nature of the research conducted within these four case studies. Middlesex's research profile is more focused on the humanities, social sciences and management and much less on the natural sciences. Its research standing is significantly less than the other three institutions and the sources of funding are somewhat different. Bristol, Imperial and the NIMR share prestigious reputations and the latter two clearly share common subject interests.

However Imperial's research leaning is institutionally broader unlike the highly focused nature of the NIMR. The purpose and focus of the research and the degree to which the students conceive of it, also vary. Those in the social sciences are expected to be the most pro-active. However, the relationship between this activity and the successful completion of a doctorate is unknown, and whether or not different abilities are fostered as a result, is also uncertain.

Differences occur in the level of information given to prospective students about the purposes of a doctorate. The greatest detail was provided by Bristol's Graduate School of Education prospectus which described the EdD programme in some depth. The aims of the doctorate were explicitly described and distinctions were made with the PhD. Literature was also extensive from the NIMR but description of the exact purpose of a PhD at this institution was not discussed. Similar assumptions were made by Imperial which took for granted that students had a clear idea of the purpose of this research degree. Institutional material from Middlesex is also extremely broad but the specific purpose of a PhD is provided in School Handbooks and similar literature is available for the DProf. The need for clarity about the purposes of doctoral programmes may increase with the growing number of professional doctorates that claim some kind of distinction from the PhD. This may also force the remit of PhDs to be reviewed and the objectives of the programmes made more explicit.

Examining institutional processes has revealed similar entrance requirements for all prospective PhD students. Similarly all are expected to register for MPhil/PhD and upgrade after submitting a transfer report. This process is mirrored on the DProf programme with the intermediate award of MProf, but not the case for EdD students who have no structured progression and no transitional award. Whether the student is awarded an MPhil if the programme is not quite completed or if at the viva stage they are not considered worthy of a doctorate, is not stated in the official documentation.

Students from all institutions were required to do some form of research training, ranging from a highly structured total research experience at the NIMR, to a research methods course at the beginning of a doctorate at Middlesex University. Clearly the structure of the programme and the environment where the student is situated, can make for a very different doctoral experience. Significant effort to develop a research community comprising both PhD and professional doctoral students was apparent within Bristol's Graduate School. The NIMR also view their students as integral to the research process. The structured peer presentation and review and the fact that the majority study full-time, could make for a constructive critical community. A similar situation may occur at Imperial given the full-time nature of most of these research students. This is something harder to achieve at Middlesex given the large numbers of part-time students. Providing a structured timetable of events may not prove attractive to those students who want to work, possibly full-time, or who have other demanding commitments.

The resource requirements during a doctorate is an implicitly important factor that additionally shapes the nature of the experience. Students studying in the natural sciences are clearly reliant on specialist equipment and the use of a laboratory in which to conduct experiments. This means that most students have to work within this particular context for much of their doctorate. The negotiation and sharing of these fundamental resources and the fact that there is a significant population of students and experienced researchers in one place, must lead to the development of a critical group. This is not necessarily the case in the social sciences where the resources are frequently of a different form. Research is often of a more qualitative nature where students merely require computer access and the availability of people as the key resource. This alone, does not naturally lead to effective collaboration, something which may need a different approach in this subject area.

There is almost complete uniformity in what is deemed appropriate for a doctoral product. All institutions have a virtually identical standard for a completed PhD. Interestingly this was also used for the EdD at Bristol University, despite it being a professional doctorate. This pattern has not been followed by Middlesex who have

devised a distinct measure for the MProf/DProf programme. Maybe because the EdD is a School rather than an institutional level initiative, the design of a new doctoral regulation is not required. However if the case is being made that a qualitative difference exists between this doctorate and a PhD, there is a certain expectation that the product should reflect this difference in kind.

Although there is consistency in PhD regulations, there is irregularity in the length of the final thesis. Evidently a social science or education document is expected to be considerably longer than the equivalent in the natural sciences. This variation in existing practice is interesting to compare with products from professional doctorates. Both the EdD and the DProf expect candidates to bear something more akin in length to that created by the PhD process in the social sciences or education. However, recent developments in 'practice-based doctorates' have begun to break the mould of a written thesis being the only doctoral outcome, and have started to explore and accept other, more tangible products as acceptable. This principle would appear to lend itself well to the philosophy of professional doctorates, where something other than a written thesis may have more professional impact and credibility. Clearly it is a delicate balance between the requirements of academia and the needs of professions, but perhaps value for expressing a thesis in forms other than text should be considered. In addition the question should be raised as to whether the product of a thesis is appropriate for all domains of doctorates.

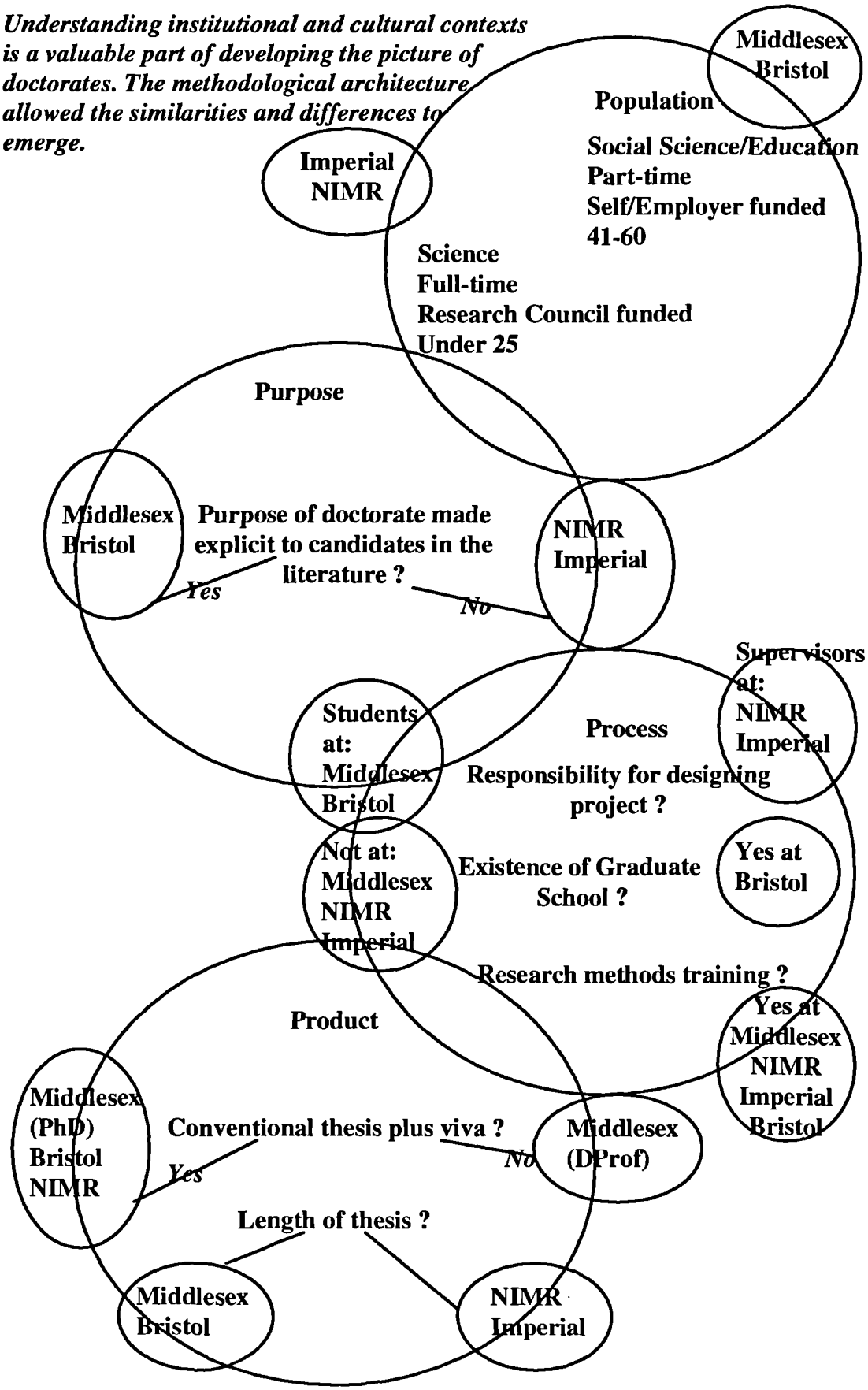
The information used to compile this chapter has generally been extracted from institutional prospectuses or other promotional material. This process has revealed that the structure and style of these documents tend to focus on the protocols of the doctorates rather than attempting to encapsulate and convey the philosophy of the programmes. This supports the conclusions in Chapter 2 where the discussion of relevant literature revealed a similar trend. There is also a widespread imbalance in the attention paid to the processes involved within a doctorate compared with either the purposes for undertaking one, or the product that is expected to result from it.

Another salient point emerging from this exploration has been the lack of consideration for the student perspective. Given the wide variety of doctoral participants, motivations and expectations, there was a significant scarcity of acknowledgement to these differences. In some ways this is associated with the lack of clarity over the purposes of doctorates. Why students are undertaking doctorates at each of these institutions, what they hope to achieve and what they expect during the course of their programme must be important information for those involved in the design and delivery of doctorates at each of these institutions. Clearly the student perspective may differ according to their particular profile, and this distinctiveness is also valuable for doctoral designers to consider.

Rich Picture 3 on the following page gives an indication of what this institutional examination can offer to the understanding of doctorates. Because students' perspectives of the purposes, processes and products of doctorates are important, the following four chapters analyse and discuss the views of those candidates affiliated with each of the institutions.

Rich Picture 3: Understanding the Institutional Locations of Doctorates

Understanding institutional and cultural contexts is a valuable part of developing the picture of doctorates. The methodological architecture allowed the similarities and differences to emerge.



PART 2 ENRICHING THE PICTURE

Preface

The aim of Part 2 is to explore stakeholders' perceptions of the purposes, processes and products of doctorates. Part 2 comprises the primary source data obtained, but draws on many of the themes raised in Part 1. The main emphasis is on the views of candidates and Chapters 4, 5, 6 and 7 discuss these. A personal commentary on how my own experiences relate to the broader candidate perspective forms Chapter 8 and finally Chapter 9 examines the opinions of other stakeholders and highlights how they relate to the views of candidates. Part 2 raises new themes that form the basis for the conclusions and recommendations of this work in Part 3.

The analyses are the product of all sources of data collection but most of the results have been obtained by analysing feedback from the questionnaires distributed to students and graduates from each of the four institutions (see Chapter 3). All students engaged in doctoral activity at each location were targeted and a questionnaire was also sent to the most recent graduates. Since the questionnaires were distributed in 1997, it is recognised that a restricted insight has been gained. This was not a longitudinal study but simply aimed at obtaining a snapshot of how graduates' perceptions might relate to students.

The three tables below show the total number of questionnaires sent and received, as well as the response rates for the sample groups. Response rates were calculable because the total details were known prior to administration of the questionnaires.

Table i. Questionnaire responses from candidates.

	Students	Graduates	Total
Total number sent	333	80	**413**
Total number received	190	27	**217**
Response rate	**57.05%**	**33.75%**	**52.54%**

Table ii. Questionnaire responses from the types of doctorates.

	PhD	EdD	DProf
Total number sent	275	113	25
Total number received	153	34	15
Response rate	**55.63%**	**30.08%**	**60%**

Table iii. Questionnaire responses from the institutions.

	Middlesex	Imperial College	NIMR	Bristol
Total number sent	134	75	91	113
Total number received	77	24	68	34
Response rate	***57.46%***	***32%***	***74.72%***	***30.08%***

Eight interviews were conducted with students and graduates from each institution, to follow-up some of the issues raised in the questionnaires. These took place during 1997 and 1998.

The same form of analysis and presentation is used in Chapters 4, 5, 6 and 7. The aim was to identify the factors that were most significant in shaping candidates' motivation, resource requirements, ways of working and their concepts and capabilities. This was achieved by comparing the six factual categories in question 1 of the student and graduate questionnaire (type of doctorate, institution, subject area, mode of study, source of finance and age on completion) with either the motivational issues in question 3, the resources in question 5, the ways of working in question 7 and the concepts and capabilities in questions 4 and 6 (see appendices 1 and 2). This comparison took the form of a *t*-test to examine the degree of significant difference or similarity that each factual category had on each issue. This also indicated the level of certainty and confidence that could be had in the results produced. All possible combinations have been explored in each table and figures up to 10% were accepted as significant with the remainder classified as having no significance (NS). Results beyond 10% were considered to produce an unacceptably low level of confidence.

Examples of the specific 'n' values for each *t*-test comparison are shown as appendices 5 and 6. The maximum number of candidate responses in any single comparison was 131 for PhD students. The minimum were figures of 2 for students aged over 61 and for distance learning full-time students. Low sample sizes have high standard errors of the estimated mean and standard deviations and are responsible for many of the findings of 'no significant difference' using the above two categories. However, the majority of the results considered in the following chapters are based on samples whose size is sufficient to allow us to be confident in their interpretation.

Below each of the tables in the following four chapters, the results in the columns are described first and then the results in the rows. Information from interviews conducted is introduced here to support and elaborate the results from the questionnaires. A 'commentary' after each table's description synthesises the key points and associates these with broader thoughts. A discussion after the tables explores the most important findings and discusses the implications. This particularly draws upon the ranked mean responses that were calculated for each issue-based question to see how important each factor was considered to be. The perceptions of students form the core of these chapters but comparisons with the views of graduates reveal the similarities and differences after completing a doctorate.

Throughout Chapters 4, 5, 6 and 7, the term 'significance' is used to convey statistical rather than conceptual meaning. This describes the outcome of the statistical analysis and indicates the level of certainty that can be had in the difference found.

Chapter 4 Candidates' Motivation

Introduction

The aim of this chapter is to understand candidates' motivation for undertaking doctoral study and to explore how it was influenced.

Table 4.1: Comparison of type of doctorate and students' decisions to begin a doctorate (by *t*-test)

Purpose - decision to begin a doctorate	**PhD and EdD**	**PhD and DProf**	**EdD and DProf**	***Percentage of significant values***
Funding	NS	10%	NS	***33%***
Personal Development	0.4%	<0.1%	5%	***100%***
Academic Prestige	NS	NS	NS	***0%***
Research Skills	6%	1%	NS	***67%***
Specialist Knowledge	NS	NS	NS	***0%***
Contribution to field	NS	0.1%	0.1%	***67%***
Enhancing career in academia	0.1%	0.5%	NS	***67%***
Enhancing career outside academia	0.5%	1%	NS	***67%***
Percentage of significant values	***50%***	***75%***	***25%***	***Overall Mean - 50%***

Description: Student Perspective

Table 4.1 shows that comparing type of doctorate with the purposes of beginning a doctorate produced a fairly high overall mean percentage of significantly different responses. This means that the type of doctorate had quite a significant influence on shaping student motivation. The greatest difference in responses were produced by the PhD and DProf student comparison. Clearly students undertaking these two types of doctorates were motivated by significantly different factors, and the perceived

importance of these purposes obviously varied. However 'gaining academic prestige' and the 'development of specialist knowledge' were factors that did not produce significantly different responses for PhD and DProf students. These are motivations commonly viewed by both groups of students as shown by the ranked mean responses in the appendices. These reveal that both groups of students considered 'gaining academic prestige' to be 'quite important' in their decision to begin a doctorate. Both groups of students ranked the 'development of specialist knowledge' third in importance and considered it to be 'very important'. Clearly these two motives are considered of equal importance when deciding to begin a doctorate and the 'development of specialist knowledge' appears to be a core motive for both these groups of students.

Comparing PhD with EdD students produced a set of responses which are more closely aligned than the PhD and DProf comparison, because a smaller number of significantly different result were produced. Clearly there is more agreement on how important these motives are for these students beginning a doctorate. Although it is still a comparison of a professional doctorate with a PhD, student motivation has a greater similarity in this comparison.

Finally the EdD and DProf comparison has produced the fewest significantly different results. This shows that the motivations for these two sets of professional doctoral students is very similar. Only 'personal development' and 'making a contribution to the field' created disagreement in their relative importance. The ranked mean responses show that although there were differences in opinion over personal development, both student groups viewed it as an important motivation. This was supported by the interviews conducted with representatives from the EdD and DProf programmes. An EdD student stated that 'personal development, the opportunity to stretch myself and the opportunity to read' were his primary motives for beginning a doctorate. Similarly an interview with a DProf student also revealed that their doctorate was undertaken 'not for career progression but for personal growth'. This was also an important motivation for the PhD students although they rated it less fundamental than the two groups of professional doctoral students.

Out of all the motivating factors, 'gaining academic prestige' and the 'development of specialist knowledge' produced no significant difference. These factors were clearly agreed upon by all students as being of equal importance when deciding to begin a doctorate, irrespective of the type of doctorate undertaken. The ranked mean responses for these factors show that 'Gaining academic prestige' was generally considered to be 'quite important' as a motive, but that this factor was least important for the PhD students and slightly more important for the two professional doctoral groups. The 'development of specialist knowledge' also exhibits results that are very similar. It is generally perceived by all students to be 'very important' when deciding to begin a doctorate. It was ranked slightly higher by the EdD students than the PhD or DProf groups, second and third respectively.

Description: Graduate Perspective

Students have yet to complete the DProf programme so no graduate comparison was possible for this population. However, EdD and PhD graduates were compared and this showed that the type of doctorate had considerably less influence on their motivation than it did for students. Clearly graduates who have undertaken EdD and PhD programmes perceive their doctoral motivation in a more similar way than current students. It is possible that this pattern is also true for prospective DProf graduates given that Table 4.1 shows students on this programme share similar views with those on the EdD. However, an interview conducted with an EdD graduate highlighted the importance of the type of doctorate for this particular individual. He said that he saw an advert for the EdD doctorate and 'it seemed to reflect my work and current position. This was an important motive for me because the style of the programme made doing a doctorate feasible, which would not have been the case with a PhD'.

The only motive to create a significantly differently result for PhD and EdD graduates was 'personal development'; even though this was the primary motivation for both groups of graduates who rated it 'very important' and 'extremely important' respectively. Both ranked it first and regarded it as more central in their decision to

begin a doctorate than students from these programmes did. Interviews with graduates from EdD and PhD programmes endorse the importance of this factor. An EdD graduate said that 'I did the doctorate for personal satisfaction, intellectual stimulus and to prove to myself that I was capable'. A PhD graduate supported this by saying 'The love of the subject was important to me but personal growth and development was critical'.

All graduates viewed the 'availability of funding' and enhancing career prospects in and out of academia as their least important motivations. This followed the same pattern as the student responses but graduates rated these purposes as slightly less important. A PhD graduate said that 'I had not thought as far ahead as my future career when I was beginning my doctorate, so this was not an important motivation'.

The motives that students unanimously agreed upon were also agreed by the graduates. However, graduates regarded 'gaining academic prestige' as more important but viewed the 'development of specialist knowledge' as less important than students.

Commentary

Comparing type of doctorate with the purpose for beginning a doctorate has given an indication of the relative proximity of the candidates' various motivations. The opinions of the DProf and PhD students are the furthest apart in terms of difference, while the closest are the motivations of the EdD and DProf students. Clearly professional doctoral students are beginning these doctorates for very different reasons from those opting for PhDs. PhD students are primarily motivated by an intention to develop their research skills whereas students on both professional doctoral programmes are driven by the desire for personal development. This may have important implications for what the students want from a doctorate and consequently how the programmes are designed and delivered. However this difference in opinion is reduced among the graduates' perspectives. All graduates were primarily motivated by personal development, clearly not the case for students.

Retrospectively, candidates may be viewing this as a more important motive leading to the successful completion of either a PhD or professional doctorate.

'Gaining academic prestige' and the 'development of specialist knowledge' were factors considered to be of very similar importance by all students. The high value attributed to these motives were also mirrored by the graduates. These are clearly common characteristics in candidate motivation and possibly common aspirations for all to achieve. The strategies for achieving specialist knowledge and the association of prestige with all types of doctorates, needs to be considered by doctoral designers and developers and could affect the structure and content of both professional doctorates and PhDs.

Table 4.2: Comparison of institution and students' decisions to begin a doctorate (by *t*-test)

Purpose - decision to begin a doctorate	**Middlesex and Imperial**	**Middlesex and Bristol**	**Middlesex and NIMR**	**Imperial and Bristol**	**Imperial and NIMR**	**Bristol and NIMR**	***Percentage of significant values***
Funding	0.9%	NS	0.5%	6%	NS	9%	***66%***
Personal Development	NS	NS	0.2%	4%	NS	<0.1%	***50%***
Academic Prestige	NS	NS	NS	NS	NS	0.5%	***17%***
Research Skills	0.1%	NS	<0.1%	9%	NS	2%	***66%***
Specialist Knowledge	9%	NS	NS	6%	NS	NS	***33%***
Contribution to field	1%	3%	0.3%	NS	NS	NS	***50%***
Enhancing career in academia	NS	7%	0.1%	0.7%	NS	<0.1%	***66%***
Enhancing career outside academia	NS	5%	NS	4%	NS	0.4%	***50%***
Percentage of significant values	***50%***	***38%***	***63%***	***75%***	***0%***	***75%***	***Overall Mean - 50%***

Description: Student Perspective

Table 4.2 shows that comparing institution with the purposes for undertaking a doctorate resulted in an equally high overall mean percentage of significant difference to Table 4.1. This again shows that the institutional affiliation significantly influenced student motivations. The comparisons which showed the greatest difference were Imperial and Bristol, and equally so for Bristol and the NIMR students. Both of these comparisons produced the same result showing that there is significant variation in the motivations of these students. Interviews conducted with students from these institutions highlight the differences in opinion over career progression. One Imperial College student was primarily motivated by the desire to pursue a research career and their PhD was viewed as 'the ticket to achieve this'. Speaking to an NIMR student endorsed this as he also had similar motivations. In contrast, a Bristol student was not concerned with career progression but 'keen to develop personal skills further and have an opportunity to reflect'.

Middlesex and the NIMR are also institutions which have students motivated by substantially different factors. Slightly closer together in opinion are Middlesex and Imperial with Middlesex and Bristol also showing a high degree of similarity. The comparison of Bristol with both Imperial and the NIMR suggests that students from the latter two institutions have similar motivations. Examining the Imperial and NIMR comparison clarifies this as no significant differences were found. The purposes of beginning a doctorate are therefore almost identical for these two groups. By looking at the ranked mean responses, the similarity of their profiles is revealed. The only anomalies are the 'availability of funding' which is considered slightly more important for Imperial students, and the 'development of specialist knowledge' which is more important for students at the NIMR. The 'development of research skills' is the main motivation for these students undertaking a doctorate. To some degree this supports the above interview statements as these students are intending to pursue a research related career. Evidently this is not the primary motive for students from Bristol or from Middlesex.

No purposes for beginning a doctorate created total disagreement in every institutional comparison, so for each purpose there was some consent about its importance. The 'availability of funding', 'development of research skills' and enhancing career prospects within academia' were the motivations viewed in significantly different ways. Clearly some students considered them as more important than others in their decisions to begin a doctorate. In contrast 'gaining academic prestige' produced the least variation. As shown in Table 4.1, this is obviously perceived as being of similar importance irrespective of the institutional affiliation of the student.

Description: Graduate Perspective

The institution where graduates did their doctorate had more influence on how they viewed their reasons for starting it than the type of doctorate did, but not as much as it affected student responses. Generally graduates from the four institutions shared similar views of the importance of these motives. However, one significant difference exists in the graduate responses showing that those from Imperial College and the NIMR regarded their reasons for beginning a doctorate differently from how the students viewed it. The NIMR graduates rated 'personal development' as their principal motivation whereas the students considered the 'development of research skills' as their main purpose. All other graduates rated 'personal development' as their most important reason for having begun a doctorate, with the exception of Imperial College graduates who followed the same pattern as the students did and still rated the development of research skills' as fundamental. Interestingly all graduates regarded their main reason for starting a doctorate as more important than the students did.

All the graduates consistently regarded enhancing career prospects in or out of academia as one of their least important motivations. This view was not expressed in such an extreme manner for the students. However, when interviewed, there appeared to be some discrepancy in how graduates regarded career prospects. A graduate from the NIMR said that 'I wanted to pursue a research career and knew

that my opportunities were limited without a PhD'. On the other hand, graduates from other institutions were less concerned with this as a motive.

Commentary

Comparing institutional type with the purpose for beginning a doctorate has shown student motivation at Bristol to be furthest apart from both Imperial and the NIMR. Clearly these institutions attract very different types of students who are beginning doctorates for significantly different reasons. Students at Bristol are undertaking their doctorates for personal development reasons whereas students at both Imperial College and the NIMR are driven by the desire to develop their research skills. This may have implications for the marketing strategies used by these institutions and also for the design and structure of their doctoral programmes. Students from Middlesex are also significantly motivated by personal development which again differs from students at Imperial and the NIMR. Responses from Middlesex and Bristol show that these institutions are fairly similar but clearly not as closely aligned as Imperial and the NIMR. As a result, competition between the latter two institutions may be high given that a very similar student population is being recruited. This also has both marketing implications and concerns for the types and structures of doctoral programmes offered.

As in Table 4.1 'gaining academic prestige' was perceived to be of similar importance for students motivation. The remaining factors generally created a high degree of difference showing considerable variation in student opinion for nearly all the motivational factors.

Table 4.3: Comparison of subject area and students' decisions to begin a doctorate (by *t*-test)

Purpose - decision to begin a doctorate	**Social Science and Education**	**Social Science and Science**	**Education and Science**	***Percentage of significant values***
Funding	9%	<0.1%	0.8%	***100%***
Personal Development	NS	NS	<0.1%	***33%***
Academic Prestige	NS	NS	NS	***0%***
Research Skills	NS	0.8%	0.2%	***67%***
Specialist Knowledge	NS	NS	7%	***33%***
Contribution to field	5%	0.5%	NS	***67%***
Enhancing career in academia	0.2%	NS	<0.1%	***67%***
Enhancing career outside academia	0.7%	NS	0.1%	***67 %***
Percentage of significant values	***50%***	***38%***	***75%***	***Overall Mean - 54%***

N.B. These three subject areas were selected for comparison because they yielded the majority responses. The remaining subject areas did not produce enough responses for any meaningful statistical analysis to emerge.

Description: Student Perspective

Table 4.3 shows that comparing subject area with purposes to begin a doctorate produced a higher overall mean percentage of significant differences than either tables 4.1 or 4.2. The biggest difference in motivation was between education and science students whose purposes for beginning doctoral study were clearly significantly different. Generally the interviews conducted supported the results in the ranked mean responses. The education students interviewed were predominantly motivated by a love for the subject coupled with the intention to pursue an academic career. One interviewee claimed that 'my main reason for beginning a PhD was because I loved studying this topic as an undergraduate and I wanted to take this forward into research.' Similarly the interviews demonstrated that social scientists were also mainly motivated by personal development. However students from the natural sciences responded quite differently. From the interviews, a PhD appeared

more of a means to an end because these students intended to pursue a scientific research career and this was the method to achieve it. This corresponds with them rating the development of research skills as their most important motivation.

'Gaining academic prestige' and 'making a contribution to the field' were not however perceived in different ways by students in education and science; clearly factors viewed as being of equal importance for both sets of students. The difference between the motivations of students in social science and those in education were also significantly different, although slightly more similar responses were identified than in the science and education comparison. This is somewhat surprising given that education and social science are often regarded as having a lot in common. However, this is a comparison of doctoral type as well as subject area because social science only relates to the PhD and education is primarily associated with the EdD. Table 4.1 revealed that the student motivations were considerably different for these types of doctorates. This appears to apply to the social science and science comparison which shows that these sets of student motivations have the greatest similarity. Interestingly this is the only subject area comparison not to be also comparing different types of doctoral programmes as both subjects are only associated with the PhD.

The 'availability of funding' is the motivation to have caused a significantly different response in each subject area comparison. This was clearly a reason perceived to be of considerably different importance for students in each subject area. The ranked mean responses show that social scientists viewed this motive as 'not important' in their decision to begin a doctorate and ranked it last. In contrast science students viewed this factor as 'important' and ranked it fourth in importance. Education students perceived it as 'quite important' and ranked it sixth. The issue of funding was therefore considerably more important to science students than to either social science or education.

In contrast, 'gaining academic prestige' created no significant difference. As with both Tables 4.1 and 4.2, this again appears to be a motivational factor of common

importance to all students, irrespective of the subject area. The ranked mean responses show this similarity. Virtually all students consider this motive to be 'quite important' and all rank it as either fifth or seventh in their scale of importance. Clearly it is not a primary motivation in beginning a doctorate but nevertheless something that all students are conscious of.

Description: Graduate Perspective

The doctoral subject area had little affect on how graduates responded and significantly less effect than it did for students. All these graduates evidently have very similar perceptions of what motivated them to undertake a doctorate. The comparison of social science and education graduates shows no difference in results which was not the case for students from these subject areas. This was because these graduates viewed all these motives in almost identical ways. Both regarded 'personal development' as their main motive and rated it 'extremely important' and the 'availability of funding' as their least. Personal development received more disagreement among graduates than it did among students. Science graduates viewed it as not nearly such an important motivation as the graduates from the other subject areas did. These graduates were principally driven by the 'development of research skills', just as science students were. Enhancing any kind of career prospects consistently features low on the list of important motives for graduates in all subject areas. Clearly this is viewed as not a critical reason for them having begun a doctorate and appears more fundamental to the opinions of students. As described above, the interviews showed anomalies to this pattern and some graduates did say that they were motivated by career intentions. However, interviews with graduates from social science and education endorsed the importance of personal development in beginning a doctorate.

Commentary

The comparison of subject area with students' purposes for beginning a doctorate has revealed that the greatest difference in motivation is between the education and science students. Education students are primarily motivated by personal development whereas science students are beginning doctorates to develop their

research skills. The students who have the most similar reasons for undertaking a doctorate are social science and science. While social science students are also driven by personal development, they also rate the development of research skills more importantly than education students. It would appear that type of doctorate is an implicitly important factor which seems to be affecting these results. This is an important consideration and would suggest that the subject area by itself is not an intrinsically influential factor in shaping student motivation.

The significant variation in how important students perceived the 'availability of funding' to be, indicates that the science students felt it was more important to secure funding before they could begin a doctorate than either social science or education students. This also suggests that different sources of funding are likely to have had an impact on how important this was perceived to be. For example if the student is self-funded, the 'availability of funding' may not be of such critical importance to them undertaking a programme of study. On the other hand, if the student is reliant on external financial support, this may be a more influential factor. This is explored further in Table 4.5.

The 'development of academic prestige' is clearly a common characteristic for students decision to begin a doctorate. In this table as with Tables 4.1 and 4.2 students are obviously in agreement about the importance of this motivation.

Table 4.4: Comparison of mode of study and students' decisions to begin a doctorate (by *t*-test)

Purpose - decision to begin a doctorate	**Full-time and part-time**	**Full-time and distance learning full-time**	**Full-time and distance learning part-time**	**Part-time and distance learning full-time**	**Part-time and distance learning part-time**	**Distance learning full-time and distance learning part-time**	***Percentage of significant values***
Funding	<0.1%	NS	1%	NS	NS	NS	***33%***
Personal Development	<0.1%	<0.1%	9%	<0.1%	NS	10%	***83%***
Academic Prestige	NS	NS	NS	NS	NS	NS	***0%***
Research Skills	<0.1%	NS	7%	NS	NS	NS	***33%***
Specialist Knowledge	NS	0.9%	NS	NS	NS	NS	***17%***
Contribution to field	NS	NS	10%	NS	NS	NS	***17%***
Enhancing career in academia	<0.1%	NS	2%	NS	NS	NS	***33%***
Enhancing career outside academia	0.3%	NS	NS	NS	NS	NS	***17%***
Percentage of significant values	***63%***	***25%***	***63%***	***13%***	***0%***	***13%***	***Overall Mean - 29%***

N.B. Due to the small number of distance learning full-time students, a statistical comparison cannot produce reliable results which are generalisable. These results are therefore not as significant as the those from the other modes of study.

Description: Student Perspective

Table 4.4 shows that comparing mode of study with purposes to begin a doctorate produced the lowest overall mean percentage of significantly different results. Evidently mode of study did not have a profound influence on shaping student motivation. The greatest variation in why students begin a doctorate were produced by comparing full-time and part-time students and full-time and distance learning part-time students. Interviews showed that full-time students were generally motivated by career intentions rather than personal development, which seemed to be the trend for those studying on a part-time basis. Apart from this obviously significant difference, the remaining comparisons showed that motives for starting a doctorate were much more closely aligned. Part-time and distance learning part-time are the two student groups which produced no significantly different results. This shows that these students had almost identical reasons for starting a doctorate and that their mode of study had not had a significant influence in shaping their responses. By looking at the ranked mean responses for this question, the similarity of these students' motivations is evident as the two profiles of results are virtually identical. Both groups of students consider 'personal development' and the 'development of specialist knowledge' as being their most important motivations. Least important were the enhancement of career prospects either in or outside academia. This suggests that when part-time students undertake a doctorate, they are less concerned with career development and are doing it more for personal satisfaction and interest. This is clearly endorsed by the above interview information.

By looking at the purposes, it is clear that 'personal development' was the motive that created least agreement; clearly a factor that some students considered of great importance and some not. The ranked mean responses show for example that 'personal development' was more important for part-time than for full-time students.

In contrast, 'gaining academic prestige' produced no significantly different results. This shows that regardless of their mode of study, all students considered this motive of equal importance. This is consistent with the other tables which have also produced a similar outcome. The ranked mean responses for this factor show that

most students viewed academic prestige as 'quite important' when considering starting a doctorate; not a primary motive for students studying by any mode. All other motives produced fairly similar results and did not show high figures of significant difference. This indicates that these purposes for beginning a doctorate were generally perceived to be of similar importance for students studying via all four modes of study.

Description: Graduate Perspective

The mode of study created the least agreement among graduates about how important they rated the eight motivations. This shows that the mode of study had the most profound affect on shaping graduate perceptions but the least effect on student views. However, this comparison is slightly distorted because no distance learning graduates were identified, so only the full-time and part-time comparisons can be discussed. Interestingly comparing these two modes of study produced the same number of different responses in both the student and graduate samples. Clearly the reasons why candidates undertake a doctorate varies significantly with the mode of study and this difference does not appear to change when the student has completed their doctorate. The responses of the full-time students were almost identical to those from graduates who studied full-time and a similar pattern is identifiable with part-time students and graduates. Full-time candidates were principally motivated by the 'development of research skills' whereas 'personal development' was rated highest in importance for part-time candidates. A similar pattern was found through the interviews with graduates. A graduate who had studied on a full-time basis said that he had 'wanted to learn and expand his knowledge of research techniques'. On the other hand, someone who had pursued their doctorate as a part-timer regarded it as 'something I did for myself'. All students and graduates of both modes of study regarded 'enhancing career prospects outside academia' as less of a motive for beginning a doctorate. However, progressing career prospects in academia was viewed by full-time students as important, but less so for part-timers. A full-time student claimed when interviewed that 'I want to get into academia and I feel that this is the best way to achieve it'.

Commentary

The comparison of mode of study with students' decisions to begin a doctorate did not yield great differences in responses. As has been described, the greatest difference was found by comparing full-time and part-time student responses who clearly have significantly different motivations for embarking on doctoral study. Full-time students are starting doctorates fundamentally to develop their research skills, while part-time students are primarily concerned with personal development. In a sense it is not surprising that little variation existed in the other modes of study because they are essentially very similar. Many of the same characteristics exist in studying distance learning full-time or distance learning part-time, and similarities exist between these two modes and students studying part-time. This is supported by the fact that all distance learning students are undertaking doctoral activity for personal development reasons. It is consequently students studying on a full-time basis which contrasts the most with these other modes of study. This is evident from Table 4 which clearly shows that the only two significant contrasts are ones that included responses from full-time students. Other comparisons which do not include full-time are essentially comparing like with like.

This has implications for the structure of a doctorate and important effects for resourcing and supervisory support. Clearly full-time students would have very different needs and expectations from a doctorate compared with either part-time or those studying by distance learning. It might also apply to the types of doctorates chosen by prospective students depending on what mode of study they wish to work in. Students who are only able, or only want to study on a part-time or distance learning basis, may be more inclined to opt for a professional doctorate or a doctorate where the focus of their study is more integrated with their professional occupation. On the other hand, those who would prefer to study full-time are probably not employed on a full-time basis and may therefore be undertaking doctoral activity for very different reasons and may be more inclined to opt for a PhD.

Table 4.5: Comparison of source of finance and students' decisions to begin a doctorate (by *t*-test)

Purpose - decision to begin a doctorate	**Self and Research Council**	**Self and Institutional Bursary**	**Self and Employer**	**Research Council and Institutional Bursary**	**Research Council and Employer**	**Institutional Bursary and Employer**	***Percentage of significant values***
Funding	<0.1%	<0.1%	<0.1%	NS	NS	NS	***50%***
Personal Development	<0.1%	1%	NS	NS	0.1%	2%	***67%***
Academic Prestige	NS	NS	NS	0.6%	NS	1%	***33%***
Research Skills	0.5%	NS	NS	NS	<0.1%	8%	***50%***
Specialist Knowledge	5%	NS	NS	NS	NS	NS	***17%***
Contribution to field	NS	NS	NS	NS	10%	NS	***17%***
Enhancing career in academia	<0.1%	6%	NS	NS	0.3%	NS	***50%***
Enhancing career outside academia	0.1%	NS	NS	1%	0.1%	NS	***50%***
Percentage of significant values	***75%***	***38%***	***13%***	***25%***	***63%***	***38%***	***Overall Mean - 42%***

Description: Student Perspective

Table 4.5 shows that the source of finance and purposes for beginning a doctorate had a greater influence on shaping student motivation than mode of study but less influence that the other factors. The purposes for beginning a doctorate varied the most for the self and research council funded students. Student interviews indicated that self-funded students were motivated by personal interest and less by career prospects, which was the case for the research council funded students. Clearly these two sets of students had significantly different motives for beginning a doctorate. Only 'gaining academic prestige' and 'making a contribution to the field' did not result in significantly different responses showing that these two sets of students perceived these factors to be of similar importance. The ranked mean responses reveal that both groups of students broadly considered these motives as being 'important' in shaping their decision to begin a doctorate.

Comparing research council and employer funded students also created a high number of responses that were significantly different. These students obviously have substantially different motives for beginning a doctorate. The ranked mean responses show that the research council funded students consider the 'development of research skills' as their primary motive and rate it as 'very important'. Least important for these students is 'making a contribution to the field'. Employer funded students on the other hand perceive 'personal development' as their main motivation and 'enhancing career prospects outside academia' as their least important reason for beginning a doctorate. This bears some relation to the interview responses described above. The employer funded students clearly had similar motivations to the self-funded students. One employer funded student stated that 'I'm not doing my doctorate for career progression or for entry into academia but for myself.'

The purpose for beginning a doctorate which caused the greatest number of different responses was 'personal development'. Clearly students funded in different ways consider this motivation to be of significantly different importance. Only students in the self funded and employer funded comparison and the research council and institutional bursary comparison viewed it to be of similar importance. However

most students regarded personal development as an 'important' or 'very important' motive in starting a doctorate and it was consistently ranked highly in terms of importance. The degree of value attached to this motive did vary with the source of funding but self and employer funded students considered it as their primary reason for embarking on a doctorate.

The motives to cause least disagreement about their importance are the 'development of specialist knowledge' and 'making a contribution to the field'. Throughout all the financial comparisons only one significant difference was found for both purposes. This shows that most students perceived these motives to be of equal importance to them beginning a doctorate, irrespective of their sources of finance.

Description: Graduate Perspective

How graduates were funded during their doctorate did not have a profound influence on how they retrospectively view their motives for beginning the programme. The source of funding has had less of an impact in shaping graduates' responses than students'. Clearly there is agreement about some of the reasons for undertaking a doctorate, regardless of how the graduate was financed. When comparing the student and graduate populations there is significant similarity in the importance attached to particular motives and also the way in which these have been ranked. For example the profile of the self-funded student and graduate sample is almost identical as both students and graduates were significantly motivated by 'personal development' but did not view the 'availability of funding' as important. An interview with a self-funded student supported this by saying that 'undertaking my doctorate was an opportunity to prove to myself and others that I was able to work at this level and achieve the title Dr'. Students and graduates funded by the other means primarily began a doctorate for either 'personal development' or for the 'development of research skills'. Clearly there is consistency with the reason for current students beginning a doctorate and with those that have graduated from a programme.

Commentary

Comparing how students are financed with their decisions to begin a doctorate showed that self and research council funded and research council and employer funded students had the most different motives for beginning a doctorate. Self-funded students are motivated primarily by personal development which is also the same as those students financed by their employers. In contrast research council supported students are beginning doctorates for the development of their research skills. This also applies to students on an institutional bursary who also regard the development of specialist knowledge as an equally significant motive. This has implications for both the type of doctorate undertaken and the nature of the research embarked upon. Clearly if a student is employer funded the research is more likely to be of professional relevance than if the student is self funded for example (although self funding could also be for career enhancement and therefore needs to be professionally relevant). Therefore by examining the sources of finance which produced results of the greatest difference, broad inferences can be made about the different structures, resource and support mechanisms. These clearly may significantly differ depending on the sources of finance.

'Personal development' produced the greatest differences in responses and the self and research council comparison showed the most disagreement over the importance of this motive. Clearly all students viewed this as an important reason for beginning a doctorate but those students funded by a research council or institutional bursary both considered it slightly less important than either the self or employer funded students. This could have implications for the expectations that students may have of doctoral programmes and for the focus of the research undertaken.

Two motives produced equally low figures of difference showing that students viewed specialist knowledge and a contribution to the field of similar importance in beginning a doctorate. These purposes were generally both considered as important reasons for starting a doctoral programme and evidently students with any source of external funding regard these as core elements of a doctorate. This could affect the design and structure of programmes given that students are effectively saying that

having specialist knowledge and making a contribution to a particular field are important desired outcomes of their period of study.

Table 4.6: Comparison of age on completion and students' decisions to begin a doctorate (by *t*-test)

Purpose - decision to begin a doctorate	**Under 25 and 25-30**	**Under 25 and 31-40**	**Under 25 and 41-60**	**Under 25 and 61+**	**25-30 and 31-40**	**25-30 and 41-60**	**25-30 and 61+**	**31-40 and 41-60**	**31-40 and 61+**	**41-60 and 61+**	***Percentage of significant values***
Funding	NS	NS	<0.1%	NS	NS	<0.1 %	NS	2%	NS	NS	***30%***
Personal Development	NS	<0.1%	0.1%	7%	0.2%	0.8%	9%	NS	NS	NS	***60%***
Academic Prestige	2%	9%	6%	7%	NS	NS	8%	NS	6%	9%	***70%***
Research Skills	NS	NS	<0.1%	<0.1%	NS	5%	0.1%	NS	0.9%	NS	***50%***
Specialist Knowledge	NS	2%	NS	NS	0.1%	2%	NS	NS	NS	NS	***30%***
Contribution to field	5%	2%	NS	<0.1%	<0.1 %	1%	0.1%	10%	0.1%	0.1%	***90%***
Enhancing career in academia	NS	NS	<0.1%	<0.1%	NS	0.4%	0.1%	9%	0.1%	0.1%	***70%***
Enhancing career outside academia	NS	NS	<0.1%	<0.1%	NS	<0.1 %	0.1%	9%	0.1%	0.1%	***70%***
Percentage of significant values	***25%***	***50%***	***75%***	***75%***	***38%***	***88%***	***75%***	***50%***	***63%***	***50%***	***Overall Mean - 59%***

Description: Student Perspective

Table 4.6 shows that comparing students' age on completion with their purposes for beginning a doctorate produced the highest overall mean percentage of significant difference. This shows that the age of the student had the biggest influence in shaping doctoral motivation. Within this table, the 25-30 and 41-60 comparison created the greatest difference in responses. Student motivation in these two age groups is clearly the most different. 'Gaining academic prestige' was the only motive not to create a significantly different result. This means that both groups of students considered this of equal importance in their decision to begin a doctorate. The ranked mean responses show very little difference as both groups perceived this as a 'quite important' motive.

Other age group comparisons also had very different reason for undertaking doctoral activity. Comparing the under 25 and 41-60 group, the under 25 and 61+ and the 25-30 and 61+ produced equally high responses of difference. Generally it would appear that responses differ with the greater the age difference. This suggests that the younger students have very different motivations for doctoral study compared with the older students. This is supported by looking at the student comparison that produced the lowest number of differences. This was produced by comparing the under 25 and 25-30 age groups which clearly shows similar motives. Only 'gaining academic prestige' and 'making a contribution to the field' created significantly different responses. The perceptions of these two student groups are almost identical as they both view the 'development of research skills' as their primary purpose for beginning doctoral study, and 'making a contribution to the field' as their least. Interviews conducted with younger doctoral students support this claim as they were keen to use their doctorate as a means of progressing their intended research related career.

The motivation which resulted in the highest number of differences was 'making a contribution to the field'. Evidently this was viewed as having significantly different importance in all the student comparisons. Some students obviously consider this to be of great importance in their decisions to begin a doctorate while others do not.

Only the under 25 and 41-60 comparison perceived this motive in similar ways and the ranked mean responses show that both these groups regarded it as being 'important' in starting a doctorate.

The 'availability of funding' and the 'development of specialist knowledge' produced the least number of different responses. Most students considered these motives important when beginning a doctorate. This suggests that students would regard these as core characteristics of doctoral study, irrespective of how old they are.

Description: Graduate Perspective

The age on completion of doctoral graduates had the least effect on how important they viewed their initial motivation to be. This is in stark contrast with the student results which clearly show that the students' age had the biggest influence on how they responded. Evidently, despite the age of graduates, they viewed their reasons for beginning a doctorate in more similar ways than the students did. Graduates of all ages regarded personal development as a primary motive but the two youngest categories also perceived the development of research skills as fundamental to them having begun a doctorate. An interview with a graduate in the 41-60 age group supports this, 'although gaining a knowledge of research was important, it was not the main reason why I began a doctorate. I was much more interested in personal growth and proving to myself that I could do it and overcome the challenge'.

Commentary

Comparing age on completion with students' decisions to begin a doctorate created the highest number of significantly different responses. Age clearly had the most influence on student motivation. The 25-30 and 41-60 comparison has shown that these two groups have the greatest difference in motivation. The younger students are principally motivated by the desire to develop their research skills whereas the older students are more concerned with personal development. This has possible implications for the marketing of doctoral programmes depending on the ages of the student population. Clearly students of different ages are attracted to doctoral study

by different factors and this may also need to be considered at the recruitment stage. If prospective students are interviewed, identifying their main motives for beginning a doctorate should be a fundamental part of this process. Students' motivations may have important implications for what they expect from a doctoral programme and could affect its structure and organisation.

Discussion

This chapter has examined candidates' perspectives on eight reasons for beginning a doctorate. The purpose was to explore current students' motivation and what significantly affected it, and compare this with the reasons that graduates gave for undertaking a doctoral programme. Graduates generally have been more in agreement than current students about their purposes for starting a PhD or professional doctorate. However, this discussion aims to identify the factors that have had the most and least influence on student motivation and how this has compared with the views of the graduates. The reasons that resulted in the greatest disagreement about beginning a doctorate are investigated as are those where there appears to be consent. By discussing these issues, common purposes should emerge as well as motivations particular to some candidate groups.

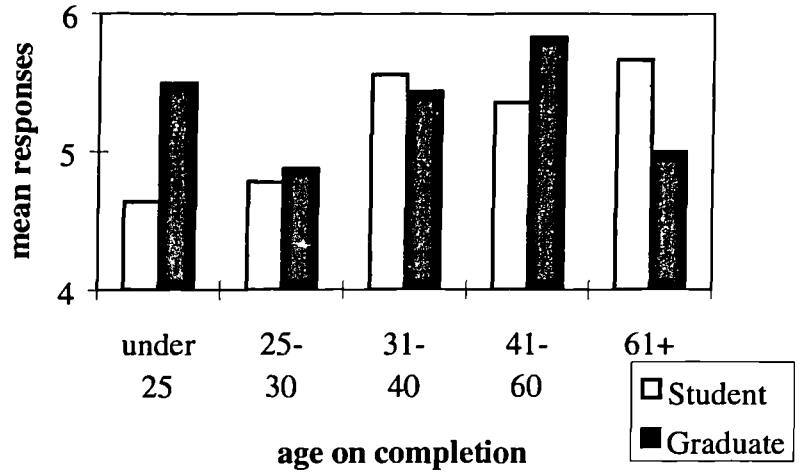
The six tables throughout this chapter have shown that the students' age on completing their doctorate has had the most influence in shaping their responses. However, the following graphical representations aim to give a visual idea of the similarities and contrasts of the range of candidates' motivations. The statistical analysis of significant difference has been previously displayed in Tables 1 to 6 and examples of the absolute values used in this statistical analysis are shown in the appendices. Each y axis on the following eight figures starts at the minimum number obtained from candidates' ranked mean responses. This shows the differences and similarities more clearly than starting at a baseline of zero. This pattern is continued in the figures shown in Chapters 5, 6 and 7. The first figures within this discussion shows the motives that have resulted in the most disagreement among students of different ages. The graduates' perceptions are also displayed for comparison. The subsequent figures shows motives most agreed on by students and again the graduates' view of them.

While age had the most bearing on how students responded, mode of study had the least effect on their doctoral motivation. Interestingly this pattern of influence is reversed for the graduate responses. The mode of study had the most profound effect on graduates' views and their age had the least. But it must be remembered that no

distance learning full or part-time graduates were discovered in the graduate sample so comparisons with the student group are slightly distorted.

The motives that caused the greatest candidate disparity

Figure 4.1. Candidates' responses and 'personal development'



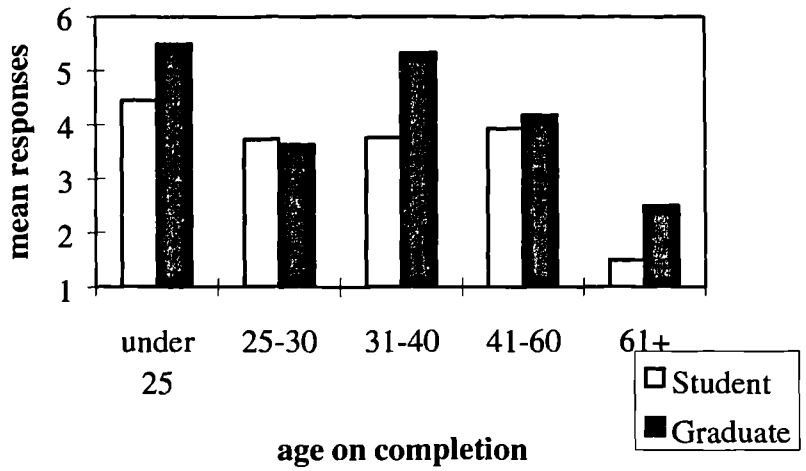
Tables 4.1 to 4.6 in this chapter have shown that 'personal development' has produced the greatest disagreement about how important it is for students beginning a doctorate. Figure 4.1 above clearly shows that this is a more important motivation for the older students than the younger ones. 'Personal development' appears not to be such a fundamental reason for beginning a doctorate for students under 30. Having said this, the figure also shows that the younger students still rate 'personal development' as 'important'. Therefore to varying degrees this is a fairly common motivation for students of all ages, and clearly a desire for personal growth is an element which features in most students minds. It does however play a more important role in the decision making process for the older age groups of students who evidently have different reasons for embarking on doctoral study.

These differences shown in Figure 4.1, have implications for the structure and topic of a doctorate. Those students for whom personal development is a critical motivation may require a differently organised programme from those students who are not primarily driven by this factor. Students rating this purpose highly may want to commit more time to their doctorate to explore their self development.

Consequently they may choose to study on a part-time basis. These students may require different resources and support mechanisms and may want advisers who are prepared to engage in and encourage personal skills development. Similarly the topic of their research could be something more of personal interest than professional and may therefore be more esoterically orientated. Having said this, students undertaking doctorates on a part-time basis in addition to full-time employment could opt for a professional doctorate even though personal development is still a critical factor. Consequently the type of doctorate undertaken is also affected by the students motivation. In addition, there are funding concerns as self-funded students may well view personal development highly, given that they are the ones making the financial commitment. Also if the primary motive is personal, financial support from a research council or funding body may be limited. Considering personal development as a crucial motive for beginning a doctorate clearly has important implications for the nature of the programme undertaken. At selection and recruitment stages, some of these issues could be useful to discuss in order to ensure that the right doctorate is chosen.

Personal development also produced the highest number of significantly different results for the graduates which again shows that this was the purpose most disagreed upon. There is some consistency in the student and graduate perspective because personal development is viewed as an important motive by all candidates. This suggests that personal development is viewed not just as an important reason for initially beginning a doctorate, but that it is a core stimulus throughout a programme, leading to successful completion. This has important implications particularly for the recruitment and selection of prospective doctoral candidates, irrespective of their age. Personal development should be considered as a fundamental motive for someone beginning a doctorate as it is clearly a factor related to successful completion. While candidates may also have other motivations, personal development, however it is defined, should be expected to play an important part. This has implications for the process and structure of recruitment and suggests that an interview is warranted to ascertain the core motivations of the candidate.

Figure 4.2. Candidates' responses and 'gaining academic prestige'



Gaining academic prestige is clearly an important motivation for all students, with the exception of students over 61. This pattern was also shared by the graduates with the youngest category viewing it as most important and the oldest age group regarding it as 'not important'. Older candidates do not appear to consider this as a critical reason for beginning a doctorate. This may suggest that they are embarking on doctoral study largely for personal interest and development rather than for any professionally orientated purpose. This could indicate that students aged 61 and over are more likely to embark on a PhD rather than a professional doctorate programme because their motivations are less professionally related and a PhD generally offers more scope to pursue a research topic of personal interest.

Most of the remaining students view academic prestige as an important motivation, which was also endorsed by the graduates. Clearly a doctorate is still perceived by candidates to have considerable standing and this academic acknowledgement appears important for candidates of all ages to obtain. This also indicates that both professional doctorates and PhDs are viewed as prestigious awards. This is significant given that professional doctorates have received considerable scepticism and in some cases have been viewed as 'dumbing down' the PhD. From the candidates' view this is clearly not the case, and despite the increasing numbers of people embarking on and graduating with doctorates, candidates' perceptions of the reputation of these awards remains positive.

Figure 4.3. Candidates' responses and 'availability of funding'

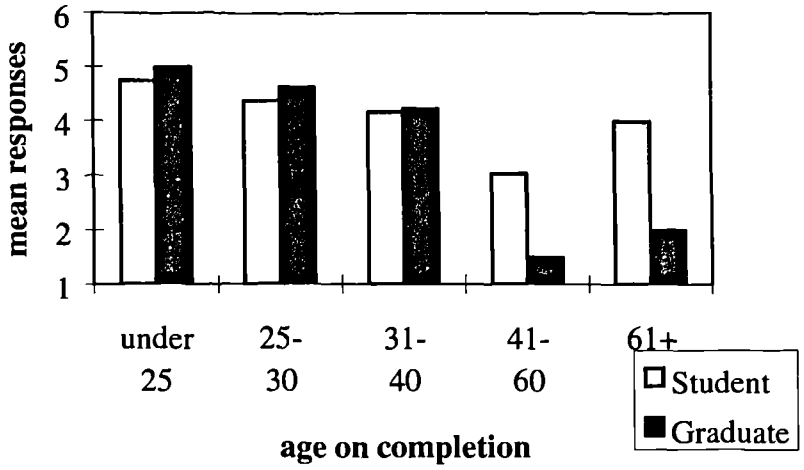


Figure 4.3 shows that while funding is an important factor, it slightly declines in importance with the increasing age of the student. Results from the graduates repeated this pattern. For the under 25 age group the issue of funding is clearly paramount to them beginning a doctorate but less so for the older candidates. This may be because the younger candidates are not in a position to fund themselves and therefore are more concerned with seeking external funding from research councils or directly from institutions. For those who are older, funding or part-funding themselves may be an option and is therefore not of such paramount concern when deciding whether to begin a doctorate. Older candidates may also get financial assistance from their employers which may affect how importantly they view the issue of funding. This could obviously affect the type of doctorate undertaken. Younger candidates are more likely to embark on a PhD programme and are more likely to achieve research council funding. Those who are older are less likely to achieve research council funding, more likely to want their research to link in with their professional activity and may seek a professional doctorate instead. As these programmes are usually not funded by research councils, candidates may seek employer support.

The motives that created the greatest candidate consensus

Figure 4.4. Candidates' responses and 'the development of specialist knowledge'

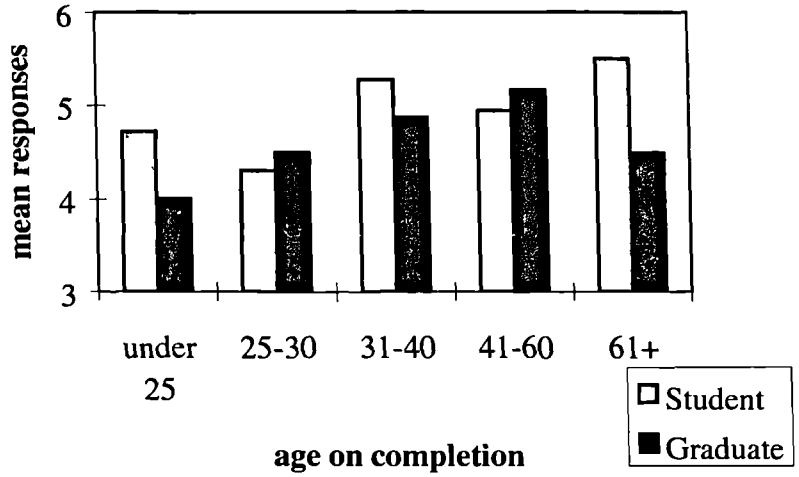


Figure 4.4 shows that developing specialist knowledge is the motivation most commonly agreed upon. Clearly students of all ages regard this as a critical factor in wanting to begin a doctorate. A general trend of this becoming a more significant influence with the increased age of the student is apparent from Figure 4.4. Students over 61 years of age evidently view this as a more critical motivation than the under 25 group.

The desire to develop a specialism implies the wish to become an 'expert'. This has ramifications for doctoral curricula, and potentially affects the nature of the research undertaken. For example it is clearly much more difficult to become a recognised expert in a field where considerable research has already been undertaken and competition is great. Carving out a potential niche is easier when the field has not been exploited and more scope exists for a novice researcher to make his or her name. This is an issue both for students and their supervisors to consider.

However this value given to the development of specialist knowledge raises two questions. Firstly, can the acquisition of specialist knowledge be taught or facilitated and if so, how ? Secondly, can this be achieved within the three year time span normally allocated for full-time PhD students ? This may have consequences for the structure and delivery of doctoral programmes.

The perceived need for specialist knowledge by students may not be viewed as being so important by non-academic employers. Clearly those seeking to recruit new academics are concerned with the candidates' specialist knowledge and how it will contribute to the work carried out in their department or faculty. However, employers outside academia are inclined to be more interested in the candidates' application of knowledge and how it is transferable to a range of different contexts. They may also be more concerned with the personal transferable skills that the candidate has acquired during their doctorate. Although these are broad generalisations, a tension exists between the importance of specialist knowledge, and the perceived importance by prospective employers, who often appear to require someone of a more flexible nature (see Chapter 9).

The development of specialist knowledge also jointly created the fewest number of significantly different responses among graduates, showing that this too was the motive most agreed upon. Figure 4.4 shows that graduates followed a similar pattern to the students' responses, where the importance of this factor generally increased with age. The graduates also considered the development of specialist knowledge as an important reason for beginning a doctorate, just as the students did. Clearly undertaking a doctorate may not have significantly affected how candidates viewed the importance of this motive.

Figure 4.5. Candidates' responses and 'enhancing career prospects within academia'

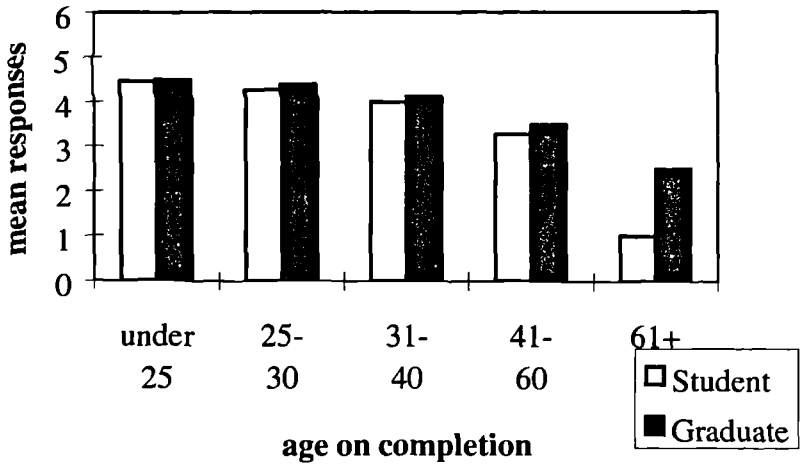
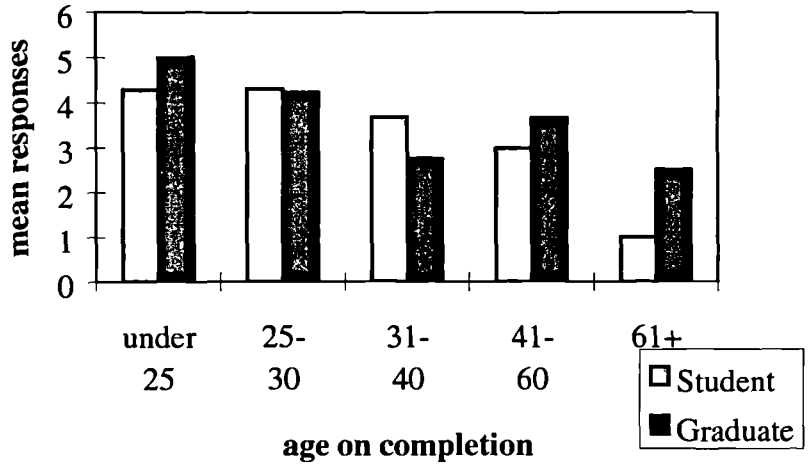


Figure 4.6. Candidates' responses and 'enhancing career prospects outside academia'



Figures 4.5 and 4.6 above concerning the candidates' career intentions follow a similar pattern to that shown in Figure 4.2 displaying perceptions of academic prestige. Enhancing career prospects in academia jointly resulted in the most agreement among graduates. Clearly enhancing career prospects in and out of academia is important to all candidates apart from those over 61. This is not surprising given that these students are going to be less concerned with future career development.

Both figures above show that enhancing career prospects as a motive for beginning a doctorate is more important for the youngest candidates and gradually declines with

age. Again this is not surprising as younger participants are clearly hoping to initiate their careers as a result of their doctoral study. However, this does have implications for the structure and orientation of doctoral programmes depending on the age of the candidates. Clearly a doctoral programme that actively recruits younger students should structure the programme bearing in mind that they are likely to be looking to use their doctorate as a significant catalyst for their career progression. Perhaps there should be an emphasis on identifying transferable skills, career intentions and appropriate plans of action to address those aims. This could also potentially affect the nature of the research undertaken. It maybe more applied if students are seeking a career outside academia, and similarly they may have particular requirements if they are planning an academic career.

It is interesting to see the perceived importance of doctoral education in candidates' anticipated career development. The slightly less importance attached to career progression by middle-aged participants may have implications for professional doctorates. These programmes clearly recruit senior professionals who are more likely to be within this age category. Although these programmes are professionally related, candidates' main motivation may not necessarily be career development.

Figures 4.5 and 4.6 shows that graduates followed a similar pattern to the students'. Evidently younger graduates still consider a doctorate to be fundamentally associated with career progression, even after they have completed their study. Whether or not this is so because it is not known if the majority of those sampled had successfully found employment.

Figure 4.7. Candidates' responses and 'development of research skills'

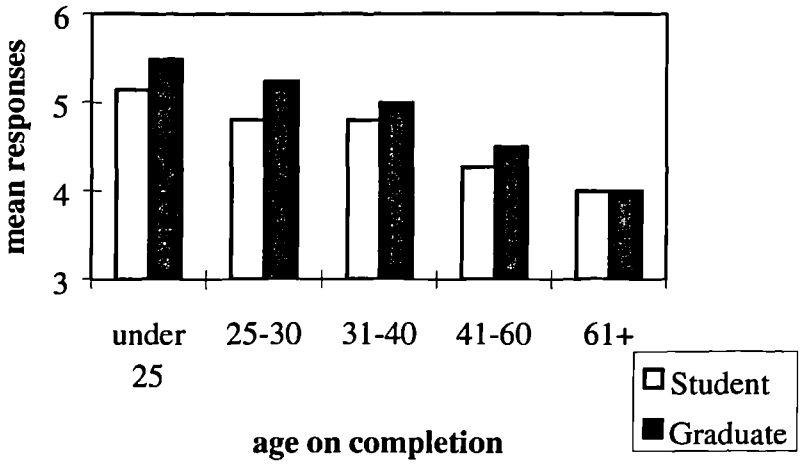
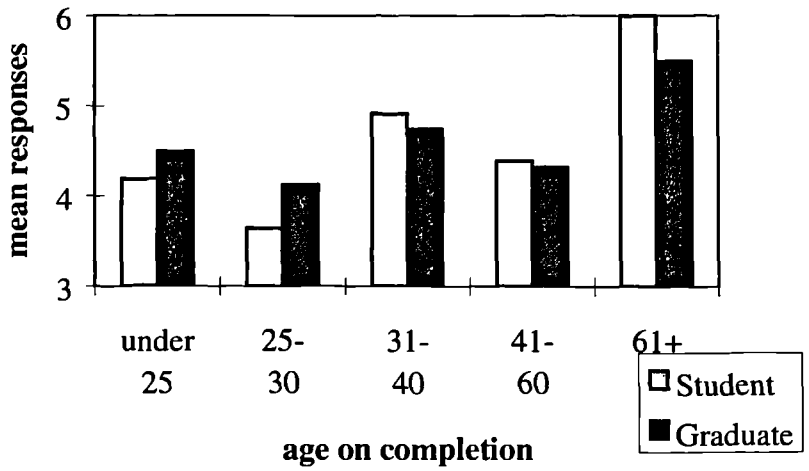


Figure 4.7 shows that the development of research skills was an important motivation for students of all ages in beginning a doctorate and the graduate results also support this. However, the youngest candidates clearly perceive this as a fundamental reason for embarking on a doctoral programme. This suggests that they would expect this to be a core feature of their programme and would expect research expertise as a personal outcome. It may also indicate that they are intending to pursue a research related profession on completion of their doctorate. This has implications for the content of doctoral programmes because younger candidates may view taught or structured inputs on different research approaches as more valuable than those who are older. However given that all candidates regarded research skills as important, any doctoral programme, professional doctorate or PhD, would be expected to address the development of these skills. Whether this has to be implicit development during the doctoral process or more explicitly tackled by including formal taught components is debatable, but certainly many PhD and professional doctoral programmes appear to currently favour the latter approach.

Figure 4.8. Candidates' responses and 'making a contribution to the field'



Among graduates, making a contribution to the field was the motive which jointly produced the most agreement about its importance. Regardless of their age, this is evidently something which all candidates aim to achieve through their programme. This is an ambitious endeavour and potentially affects the focus of the research that is undertaken. Students may initially wish to embark on a project which would prove to be too large and unfeasible in the time-scale because they regard it as having the potential to make an impact on the field. The role of the supervisor is therefore critical at this stage to ensure the students' project is realistic, yet potentially influential.

Making a contribution to knowledge or to the field has traditionally been the standard of the PhD. However, given that candidate numbers have significantly increased, it may be harder now for this standard to be met than was originally the case. Similar to the development of specialist knowledge, greater competition in a particular field may make it more difficult for a new researcher to create a significant impact. A three year time-span may not be long enough for a student to achieve this contribution. It could therefore be argued that although PhD candidates continue to make a contribution to their chosen field, the significance of that impact may be less consistent than it was when fewer candidates existed. On the other hand, greater numbers may collectively be advancing the development of a field despite a reduced contribution by the individual.

Interestingly Figure 4.8 shows that the importance of making a contribution increases with age. This may be because younger candidates are realistic about the significance of their work within the time-span, and maybe more concerned with completing as soon as possible and progressing with their careers. Older candidates however, may be more prepared to spend considerably longer on their doctorate in order that an impact is created.

As this is clearly a factor which all candidates are concerned with, the structure of different types of doctorates could be affected. Candidates who undertake professional doctorates evidently view making a contribution to the field as an objective as well as those opting for a PhD. However, the nature of that contribution and the context where the impact is made may be very different for candidates on professional doctorates. It is likely to be within the professional field rather than academia and the contribution may be more applied and developmental rather than theoretical. This has implications for how a standard of a doctorate is defined and interpreted. Indeed it questions if making a contribution to the field is still an appropriate statement to consider.

Concluding observations of candidates' perceptions on doctoral purposes

- Motivation distinguished by age
- Young candidates most concerned with the development of research skills
- Mature candidates more concerned with personal development

This analysis has shown that candidates have very clear ideas about why they have undertaken a doctoral programme. The results were obtained by distributing an almost identical questionnaire to both students and graduates, supported by semi-structured interviews. In general, a great deal of similarity existed between the student and graduate perceptions, although clear differences have also been identified. The interviews have also largely endorsed the statistical outcomes.

The strength of the candidate voice has emerged throughout this analytical process which clearly highlights the value placed on the initial decision to start a doctorate. None of the candidates sampled appear lacking in motivation and all had a clear reason for embarking on a programme. None of them suggested that they started a doctorate because they could not think of anything else to do, which is reassuring given the commitment necessary for such an undertaking. This is important for supervisors and organisers of doctorates to bear in mind and may have implications for the support mechanisms built into a programme.

Personal development and the development of research techniques were repeatedly shown as fundamental motives for students and graduates, even though personal development was generally viewed as being more important by graduates. The interviews endorsed the critical importance of personal development but also showed the development of research skills as significant. If personal development is an overriding common denominator in candidate motivation, how are doctoral programmes going to address this need in the 21st century ? In an era of lifelong learning, this must continue to be a key reason why people of all ages undertake doctorates. As career patterns change and a new sense of urgency in maintaining employability emerges, the need to be consciously aware of one's personal development will also be necessary. Doctorates need to consider this as an issue

appropriate to candidates of all ages, and perhaps need to identify what personal development means within the context of a particular programme.

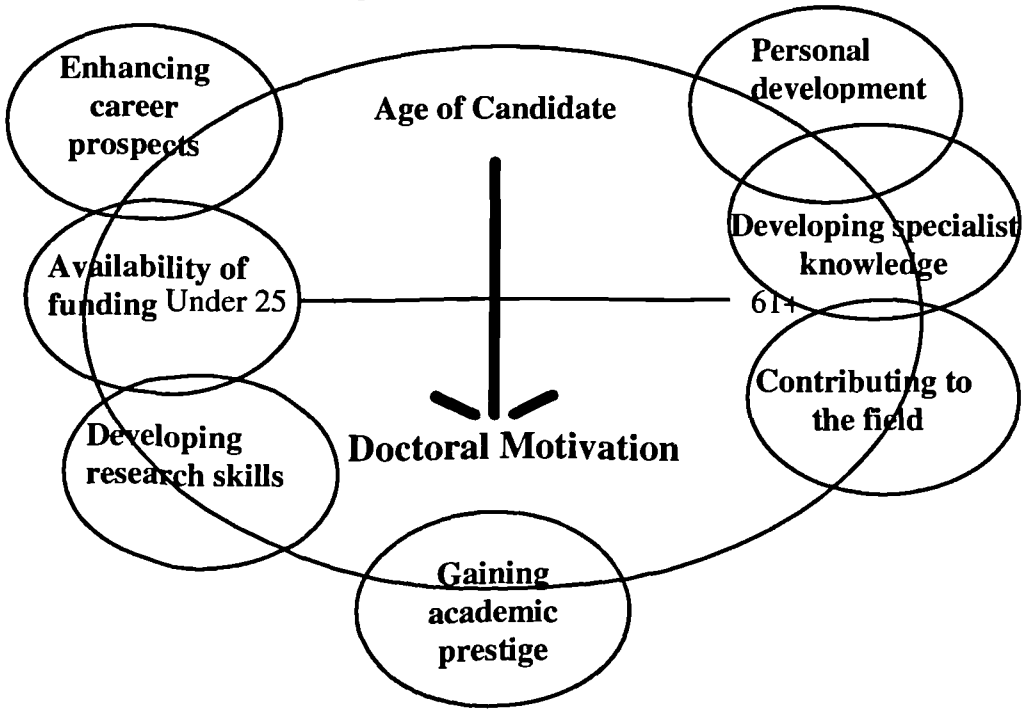
This outcome potentially influences the recruitment and selection procedures for doctoral admittance. If personal development is identified as a critical motive by both students and graduates, it must be something that aids successful completion. Completion is clearly the desired outcome for all involved in the doctoral process, so ascertaining at the outset who is driven by the desire for personal growth, could be significantly advantageous. This is an important consideration for supervisors and organisers of doctoral programmes.

The development of research skills has been shown as another significant motive for candidates. It is also apparent that younger students are more concerned with acquiring this knowledge. Many doctorates have already explicitly addressed this and have structured research methods teaching into the programmes. However this tends to be during the initial stages of a doctorate, where often the application of the theoretical knowledge is yet to come. A programme which structured the development of techniques in accordance with the evolution of a research project may be more constructive and have more direct relevance for the candidate. Clearly this would vary significantly depending on the subject area and orientation of the research, but synchronising theoretical delivery with practical application may lead to more effective researchers.

Some of the major outcomes of this chapter, and the characteristics of doctoral motivation have been captured in Rich Picture 4. This shows some of the differences in opinion depending on the age of the candidate.

Rich Picture 4: Understanding Candidates' Motivation

The methodological architecture revealed the lack of understanding of candidates' perspectives. Rich Picture 4 is the first that shows the candidates' opinions of the purposes, processes and products of doctorates. Picture 4 highlights the diversity of candidates and their different motives, depending on their age.



Chapter 5 Candidates' Resource Requirements

Introduction

The aim of this chapter is to explore candidates' views of the process of engaging in a doctorate. It examines the perceived importance of fourteen different resources and experiences that could be components of any doctoral programme.

Table 5.1: Comparison of type of doctorate and the importance of resources and experiences to students (by *t*-test)

Resources and Experiences	**PhD and EdD**	**PhD and DProf**	**EdD and DProf**	***Percentage of significant values***
Library access	NS	7%	9%	***67%***
Regular supervision	4%	5%	NS	***67%***
Computing facilities	6%	0.8%	NS	***67%***
Subject specialist equipment	0.1%	0.3%	NS	***67%***
Research expenses	<0.1%	<0.1%	NS	***67%***
Conference access	0.4%	5%	NS	***67%***
Peer support	7%	NS	NS	***33%***
Academic environment	NS	NS	NS	***0%***
Teaching opportunities	NS	NS	NS	***0%***
Additional study	NS	NS	NS	***0%***
Personal skills development	NS	NS	NS	***0%***
Appraisal	NS	NS	4%	***33%***
Work experience	10%	NS	NS	***33%***
Business training	NS	5%	3%	***67%***
Percentage of significant values	***50%***	***50%***	***21%***	***Overall Mean - 40%***

Description: Student Perspective

It is clear from Table 5.1 that comparing type of doctorate with the importance of resources and experiences during a doctorate has produced the highest overall mean percentage of significantly different results out of all six tables. This shows that the type of doctorate had the biggest effect in shaping students' perceptions. This suggests that students engaged in different types of doctorates have different resource requirements.

Table 5.1 shows that comparing PhD and EdD student responses had the same result as comparing PhD and DProf responses. Half of the resources and experiences were perceived to be of significantly different importance in these two comparisons. This suggests that the PhD student view is different from students doing either of the professional doctorates. Looking at the EdD and DProf comparison which shows a much smaller number of significant differences supports this. Clearly these students have similar perceptions of which resources are most important. 'Access to a library', 'appraisal' and 'business training' were the only resources to produce significantly different responses. Both EdD and DProf students viewed library access as important but EdD students rated it as slightly more important and ranked it first. 'Appraisal' was perceived as 'quite important' by EdD students and 'important' by DProf students, and 'business training' was thought to be 'not important' by EdD students who ranked it last, but 'quite important' by DProf students.

By looking at all fourteen resources, patterns are visible. Half of the resources resulted in an equally high number of significantly different responses (67%), and four failed to produce any significant difference at all. An 'academic environment' was generally viewed by all students as being 'important' with the DProf students rating it the lowest of the three doctoral types. 'Teaching opportunities' were perceived to be 'not important' by all students who ranked this experience as either eighth or ninth in importance. 'Additional study outside the research programme' was regarded as 'quite important' by all and 'personal skills development' was viewed as 'important' by all with the DProf students rating this slightly higher.

Clearly all students, irrespective of the type of doctorate hold a common view of these resources and experiences.

Description: Graduate Perspective

As there are no graduates as yet from the DProf, comparisons with this sample were not possible. Only graduate responses from the PhD and EdD programmes could be related to the student responses. An interesting result occurred, showing that the type of doctorate had the greatest impact on how graduates viewed these resources, the same pattern as displayed by the students. Clearly depending on whether a PhD or EdD was pursued, each category of candidates had significantly different requirements or experiences. The ranked mean responses show very similar profiles of responses for both students and graduates from each doctoral type. For example, both students and graduates from PhD programmes, rated library access, supervision and computing equipment as their most important resources. They also both considered additional study, teaching opportunities and business training as not important during the doctoral process. Results from the EdD are slightly different. Again library access was rated highest by both students and graduates but the remaining resources were viewed in slightly different ways. In general, EdD graduates perceived all the resources as more important than the students, and no common agreement was shown about which resource was the least important. Students considered business training as their lowest, while graduates thought that work experience was unimportant during the doctoral process.

Commentary

The type of doctorate had the greatest impact on how students and graduates viewed these resources. By and large, graduates followed a similar pattern to the student responses. Table 5.1 shows that the perceptions of students from the two professional doctorates are very similar and significantly different from those of the PhD students. Clearly the importance of resources differs according to the type of doctorate undertaken. This has implications for the design and structure of different doctorates and what resources and experiences should be made available to candidates from different types of programmes.

Four of the resources were agreed to be of similar importance by all students, irrespective of the type of doctorate. Both 'an academic environment' and 'personal skills development' were viewed as 'important' features of a doctoral process by all students. This suggests that these are core characteristics of doctoral study, regardless of programme type. This could affect the way that both professional doctorates and PhDs are structured and the kinds of experiences that students are required to engage in. Potentially it also impacts upon the context in which research students are situated, as this is clearly a matter of concern to all students. The organisation of institutions and departments would need to take account of these factors as they may have a bearing on how students select a place of study.

In contrast, none of the candidates regarded 'teaching opportunities' as an important experience during the doctoral process. Whether this is because none of them intended to teach after completing their doctorate is unknown, but obviously this experience is not viewed as an important component of any doctorate. This is an interesting response given that many PhD graduates still enter an academic career where lecturing or teaching is often involved. This candidate perception of the importance of teaching opportunities may clash with the views of other interested parties, but nevertheless could affect the way in which programmes are designed and structured. Despite the fact that candidates do not view this as a core experience during a doctorate does not refute its importance during the doctoral process.

Table 5.2: Comparison of institution and the importance of resources and experiences to students (by *t*-test)

Resources and Experiences	Middlesex and Imperial	Middlesex and Bristol	Middlesex and NIMR	Imperial and Bristol	Imperial and NIMR	Bristol and NIMR	Percentage of significant values
Library access	NS	NS	NS	NS	NS	NS	*0%*
Regular supervision	NS	NS	7%	NS	10%	0.9%	*50%*
Computing facilities	NS	NS	5%	NS	NS	7%	*33%*
Subject specialist equipment	<0.1%	NS	<0.1%	<0.1%	NS	<0.1%	*67%*
Research expenses	<0.1%	2%	<0.1%	<0.1%	NS	<0.1%	*83%*
Conference access	NS	2%	NS	NS	NS	0.5%	*33%*
Peer support	NS	NS	NS	7%	NS	2%	*33%*
Academic environment	NS	NS	NS	NS	NS	NS	*0%*
Teaching opportunities	NS	5%	4%	NS	NS	NS	*33%*
Additional study	NS	NS	NS	NS	NS	NS	*0%*
Personal skills development	NS	NS	NS	NS	NS	NS	*0%*
Appraisal	NS	NS	NS	NS	NS	NS	*0%*
Work experience	1%	NS	NS	0.8%	NS	8%	*50%*
Business training	NS	NS	NS	NS	NS	NS	*0%*
Percentage of significant values	***21%***	***21%***	***36%***	***29%***	***7%***	***50%***	***Overall Mean-27%***

Description: Student Perspective

Table 5.2 shows that by comparing the institution with the importance of resources and experiences have produced a relatively low overall mean percentage of significantly different responses. This suggests that students from these four institutions agreed about the importance of many of these resources. Clearly the institutional affiliation of the students did not have a significant influence in shaping their responses.

Comparing Bristol students with the NIMR responses produced the highest number of different responses. These students perceived the importance of half of the resources in different ways. This is in contrast to the Imperial and NIMR comparison, which barely produced any results of significance. Only 'regular supervision' is perceived as having different importance to the process of a doctorate. Imperial students view this as 'important' whereas NIMR students perceive it as 'very important'. Despite this difference, supervision is clearly a critical resource for these students.

The fourteen resources and experiences have all received a variety of different results showing that they have been viewed as having different importance during the process of a doctorate. 'Research expenses' is the resource that creates the greatest number of significantly different responses. This means that some students consider this as important and others don't. The ranked mean responses show that Middlesex students consider expenses to be 'important' whereas Bristol students viewed this resource as only 'quite important'. This is in contrast with Imperial and the NIMR students who both regarded 'research expenses' as 'very important' and ranked this factor as second and first in importance respectively. This explains why the Imperial and NIMR comparison was the only one not to produce a significantly different result as they both had extremely similar views of how important this resource should be.

In contrast, six resources failed to create any significantly different responses. This means that all students considered them to be of similar importance during a

doctoral process, irrespective of their institutional affiliation. 'Access to a library' was viewed as 'very important' and ranked highest by all student groups. All students viewed an 'academic environment' as 'important' and 'additional study outside the research programme' was thought to be 'quite important'. 'Personal skills development' was seen as 'important' as was 'appraisal'. Finally 'business training' was considered 'not important' by all students who consequently ranked it last. Clearly this is a resource that is not central to students' doctoral experiences, no matter what institution is attended.

Description: Graduate Perspective

The institutional affiliation of students had considerably less influence on how they responded and this pattern was mirrored by the graduates. All students and graduates rated library access as their most valuable resource, and teaching opportunities and business training as not at all important to the doctoral process. Clearly the type of institution has not profoundly affected the candidates' responses, and it is interesting to see little difference in student and graduate opinions.

Commentary

The fact that Table 5.2 shows few results of significant difference demonstrates that candidates from the four institutions viewed the resources in similar ways. Clearly Imperial and the NIMR students have almost identical opinions of these resources, as only 'regular supervision' is slightly disagreed upon. As is known, both these samples are of PhD students within a natural science context, even though there are institutional differences. Clearly the structure and design of doctorates at both these institutions and the process of undertaking a doctorate is very similar.

In contrast students from Bristol and the NIMR have differing views of the importance of these resources. These institutions are very different, plus this is a comparison of PhD and professional doctoral student responses. These students evidently have different expectations about the process of a doctorate.

This information has implications for the designers and co-ordinators of the doctoral programmes at these institutions as different candidate' needs are clearly having to be met. Having said that, there is a great deal of common agreement about the importance of these resources, regardless of candidates' institutional affiliation.

Considerable disagreement over the importance of 'research expenses' was identified. It would appear that the science candidates doing PhDs at Imperial and the NIMR considered this a fundamental resource to have during a doctorate. On the other hand those involved with EdDs at Bristol are not so concerned. This is clearly a critical component for the candidates from Imperial and the NIMR and potentially affects the administration and organisation of these programmes. This has resource implications for the providers of programmes and for the decisions made by candidates about which doctorate to undertake. Financial considerations are evidently paramount during the doctoral processes of the science students.

Four resources were unanimously agreed upon by all students as being important features of a doctoral process. The significance of 'library access', 'an academic environment', the 'development of personal skills' and 'appraisal' to all students suggests that they view them as core characteristics of a doctoral experience. Whether or not these perceived needs are being met is unknown but these are critical resources to students, irrespective of their institution. This is an important consideration for the designers of either professional doctorates or PhDs and maybe features that actively need to be considered for all programmes.

In contrast 'business training' was not viewed as a core characteristic by any of the candidates. This is an interesting result given that an increasing number of PhD graduates are entering employment other than academia where this could be a useful and relevant experience. Employers have recently identified a lack of business awareness in recent graduates and expressed this as a weakness in their recruitment. Candidates clearly do not see this as part of a doctoral process; something which other interested parties may challenge.

Table 5.3: Comparison of subject area and the importance of resources and experiences to students (by *t*-test)

Resources and Experiences	Social Science and Education	Social Science and Science	Education and Science	*Percentage of significant values*
Library access	NS	NS	NS	*0%*
Regular supervision	NS	NS	NS	*0%*
Computing facilities	NS	5%	7%	*67%*
Subject specialist equipment	NS	<0.1%	<0.1%	*67%*
Research expenses	2%	2%	<0.1%	*100%*
Conference access	NS	NS	9%	*33%*
Peer support	NS	6%	NS	*33%*
Academic environment	NS	NS	NS	*0%*
Teaching opportunities	NS	10%	NS	*33%*
Additional study	NS	6%	NS	*33%*
Personal skills development	NS	NS	NS	*0%*
Appraisal	NS	NS	NS	*0%*
Work experience	NS	NS	0.8%	*33%*
Business training	NS	4%	NS	*33%*
Percentage of significant values	*7%*	*50%*	*38%*	***Overall Mean - 31%***

Description: Student Perspective

Table 5.3 shows that comparing subject area with the importance of resources and experiences during a doctorate has produced a higher number of significantly different responses than Table 5.2. Clearly the subject area of the student had a greater influence in shaping students' responses than the institution did.

Comparing social science and science produced the greatest number of different responses. This shows that students from these two subject areas regarded half of the resources in significantly different ways. This is in contrast to the social science and education comparison, which clearly shows very similar views. Both groups of students viewed 'access to a library' as their most important resource and 'business

training' as their least. Only 'research expenses' was regarded to be of different importance. Social science students viewed this resource as 'important' whereas education students only considered it as 'quite important'. In terms of the similarity and differences in opinion of the students, social science and education are obviously the closest aligned, and social science and science are the furthest apart.

The resources have been regarded in a range of different ways. 'Research expenses' created a significantly different response in each comparison. This shows that all the students regarded this resource to be of different importance during the process of a doctorate. The ranked mean responses show that social science students viewed expenses as an 'important' resource whereas education students only considered it as 'quite important'. Science students viewed it as 'very important' and ranked it third in order of priority. These students clearly felt it was a critical resource to have during the process of a doctorate, whereas education students did not.

In contrast, 'library access', 'regular supervision', an 'academic environment', 'personal skills development' and 'appraisal' all produced no significantly different responses. This shows that all students viewed these resources as being of similar importance. In addition they all thought that 'library access' was 'very important and the same view was largely held of the need for regular supervision. Having an 'academic environment' was seen as 'important' by all students as was the development of personal skills and appraisal. Clearly the resources that were unanimously agreed upon by all students were perceived as fundamental to the doctoral process. There was also some consensus of opinion over resources that were not viewed as important. Both business training and teaching opportunities were ranked last and not perceived as relevant to the process of conducting a doctorate.

Description: Graduate Perspective

Subject area had a smaller affect on shaping graduates' responses than it did for the students. More similarity was revealed among the views of graduates compared with students. All rated library access and regular supervision among the most important resources with science graduates also regarding specialist equipment as crucial to the

doctoral process. By and large this reflects the students' views and the resources favoured least were also consistent. These were business training and teaching opportunities and both students and graduates from all subject areas regarded these as not at all important during a doctorate.

Commentary

The opinions of social science and education students are almost identical and both view these resources to be of similar importance during a doctorate. This has implications for how these doctoral programmes are designed. Students from these two subject areas have a common understanding of what features should be prominent during their doctoral process. This is interesting given that the education students are largely pursuing a professional doctorate and yet clearly have similar needs to the PhD students.

Despite both the social science and science students pursuing PhDs, this comparison has shown the greatest differences in opinion. Different resources are viewed as being central to their doctoral experiences. Also, the significant differences between the science students views and those of both the education and social science students have implications for how the respective programmes are structured, perhaps with some resources being more prominent in some programmes than in others.

As also shown in Table 5.2, 'research expenses' is clearly seen as a core characteristic for science students and slightly less important for social science and education students. However, all students agreed that 'library access' and 'regular supervision' were critical features of a doctorate, irrespective of their subject area. 'An academic environment', 'personal skills development' and 'appraisal' were also agreed as important. From the students' perspective, these are resources and experiences which should feature prominently during a doctorate. Clearly students from all these subject areas are concerned with access and advisory contact. Many of these resources are directly connected with personal support during the process of a doctorate, obviously an area that students feel is of critical importance. This is a

crucial issue to consider in relation to how doctoral programmes are administered and organised. Students from both professional doctorates and PhDs in these three subject areas want to be actively monitored and want close association with their advisory network.

To some extent these patterns were reflected in the graduates' responses, although more similarity was expressed. Evidently, once the doctorate has been completed, views concerning these resources were more closely aligned and the subject association had little influence on their responses.

Table 5.4: Comparison of mode of study and the importance of resources and experiences to students (by *t*-test)

Resources and Experiences	**Full-time and part-time**	**Full-time and distance learning full-time**	**Full-time and distance learning part-time**	**Part-time and distance learning full-time**	**Part-time and distance learning part-time**	**Distance learning full-time and distance learning part-time**	***Percentage of significant values***
Library access	NS	<0.1%	4%	<0.1%	4%	1%	***83%***
Regular supervision	NS	NS	NS	NS	NS	NS	***0%***
Computing facilities	0.2%	<0.1%	NS	<0.1%	NS	0.8%	***67%***
Subject specialist equipment	<0.1%	<0.1%	NS	<0.1%	NS	0.3%	***67%***
Research expenses	<0.1%	NS	2%	NS	NS	NS	***33%***
Conference access	2%	NS	NS	NS	NS	NS	***33%***
Peer support	NS	NS	8%	NS	NS	NS	***17%***
Academic environment	NS	NS	NS	NS	NS	NS	***0%***
Teaching opportunities	NS	<0.1%	NS	<0.1%	NS	0.7%	***50%***
Additional study	NS	NS	NS	NS	NS	NS	***0%***
Personal skills development	NS	NS	NS	NS	NS	NS	***0%***
Appraisal	NS	NS	NS	NS	NS	NS	***0%***
Work experience	<0.1%	NS	NS	NS	NS	NS	***17%***
Business training	3%	NS	NS	NS	NS	NS	***17%***
Percentage of significant values	***43%***	***29%***	***21%***	***29%***	***7%***	***29%***	***Overall Mean - 26%***

Description: Student Perspective

Table 5.4 shows that comparing mode of study with the importance of resources and experiences during a doctorate created few significantly different results. Mode of study did not have a substantial impact on shaping student responses. Table 5.4 also demonstrates that there is a lot of similarity in how important students perceived these resources to be during a doctorate, irrespective of their mode of study.

Despite this lack of impact that mode of study had on responses, comparing full-time and part-time students created the greatest difference. Table 5.4 shows that nearly half of the resources in this comparison were perceived to be of significantly different importance to these two groups of students. For example, the full-time students considered 'subject specialist equipment' and 'research expenses' to be 'very important' during the process of a doctorate. In contrast, the part-time students perceived both of these resources as only 'quite important'. Clearly these are resources which are considered fundamental to a full-time doctorate but not so important for part-time study.

The other comparisons of mode of study result in considerably fewer significant differences, showing greater similarity in opinions. Comparing part-time student responses with those of the distance learning part-timers produced the smallest difference. Only 'access to a library' was perceived to be of different importance by these two groups of students. Part-time students viewed this resource as 'very important' in contrast to the distance learning part-timers that only saw it as 'important'. Obviously this is a relatively important resource for both these groups of students but slightly more central to the experience of a part-time doctoral student.

Although a small number of significantly different figures were produced overall, each of the fourteen resources were perceived in different ways, and the column displaying the percentage of significant values shows this. 'Access to a library' resulted in the greatest number of significantly different responses. This means that the students considered this resource in different ways depending on their mode of

study. Only the full-time and part-time comparison reveals similar responses as both sets of students viewed this resource as 'very important'. As discussed above, the distance learning part-time students viewed library access as the least important out of all the students, even though they still considered it to be 'important'. Interestingly the distance learning full-time students perceived this resource to be the most important to the process of a doctorate and rated it 'extremely important'. However, as there were only two students who fell into this category, no generalisations can be made on this basis, and this is important to remember for the remaining discussion. It is therefore clear that library access is an important resource to all students, irrespective of their mode of study, but considered more important by some compared with others.

The students also viewed 'computing facilities 'and' subject specialist equipment' in significantly different ways. Full-time students viewed these resources as 'very important' whereas part-time students considered computing to be 'important' but specialist equipment to only be 'quite important'. Distance learning full-time students ranked 'computing facilities' as jointly the most important resource and rated it 'extremely important'. However, 'subject specialist equipment' was rated as 'not at all important' and ranked last. The distance learning part-time students viewed both these resources as 'important' and consequently ranked them fourth and sixth in importance. Generally these resources are perceived to be of importance during the process of a doctorate, with the exception of the distance learning full-time students' view of 'subject specialist equipment'.

Five resources created no significantly different responses suggesting that all the students viewed them to be of similar importance. The students regarded 'regular supervision' to either be 'very important' or 'important', clearly a crucial resource for any mode of doctoral study. An 'academic environment' was viewed as 'important' by all the students, apart from the distance learning full-timers. However, given that only two values are present, a meaningful calculation of their different opinions is not possible. This resource is therefore generally regarded as an important part of the doctoral process. 'Additional study' was generally viewed as

only 'quite important' with the exception of distance learning part-time student who considered it to be 'important'. All students regarded the development of personal skills as 'important' and finally, 'appraisal' was regarded as either 'quite important' or 'important' by the students. In general, where resources did not receive significantly different responses was because all students viewed them as important parts of the doctoral process.

Description: Graduate Perspective

As no distance learning graduates were identified within the sample, comparisons could only be made between those who had studied on a full and part-time basis. The graduates displayed much more agreement than corresponding students had done. Clearly the mode of study had not significantly affected how graduates viewed these resources and experiences. Library access appeared as the most fundamental resource to have during a doctorate and was ranked first by both the graduates and students. However, this was viewed as most important by part-time graduates. Similarly business training and teaching opportunities were unanimously regarded as not important by all candidates, resources that were evidently unaffected by the mode of study.

Commentary

Table 5.4 clearly shows great similarity in student views and even greater among graduates. This shows that the mode of study has had little impact on the way candidates responded. The greatest difference in opinion was between the full-time and part-time candidates who evidently have different needs during the process of a doctorate. This has important ramifications for how doctoral programmes are designed and structured. Resources need to be made available to varying extents according to the mode of study.

'Access to a library' was viewed in different ways by students but viewed as a core characteristic to both full and part-timers. This is an important consideration for how programmes are designed and administered and for how access is provided. Generally all students, irrespective of their mode of study, viewed 'regular supervision', 'an academic environment' and the 'development of personal skills' as

key elements of a doctoral process. This again has implications for how programmes are designed. Ensuring that all three resources are structured into a part-time or distance learning doctoral experience may affect how a programme is organised and may differ to the structure of a full-time students' doctorate.

Table 5.5: Comparison of source of finance and the importance of resources and experiences to students (by *t*-test)

Resources and Experiences	**Self and Research Council**	**Self and Institutional Bursary**	**Self and Employer**	**Research Council and Institutional Bursary**	**Research Council and Employer**	**Institutional Bursary and Employer**	***Percentage of significant values***
Library access	NS	NS	NS	NS	NS	NS	***0%***
Regular supervision	6%	NS	NS	NS	1%	NS	***33%***
Computing facilities	<0.1%	<0.1%	NS	NS	2%	1%	***67%***
Subject specialist equipment	<0.1%	6%	NS	1%	<0.1%	0.4%	***83%***
Research expenses	<0.1%	<0.1%	NS	NS	<0.1%	0.1%	***67%***
Conference access	1%	5%	NS	NS	1%	5%	***67%***
Peer support	<0.1%	NS	NS	NS	3%	NS	***33%***
Academic environment	NS	NS	NS	NS	NS	NS	***0%***
Teaching opportunities	7%	NS	0.9%	NS	NS	5%	***50%***
Additional study	NS	NS	NS	NS	NS	NS	***0%***
Personal skills development	NS	NS	NS	NS	NS	NS	***0%***
Appraisal	NS	NS	7%	10%	4%	NS	***50%***
Work experience	5%	NS	NS	NS	4%	NS	***33%***
Business training	NS	NS	NS	NS	NS	NS	***0%***
Percentage of significant values	***57%***	***29%***	***14%***	***14%***	***57%***	***36%***	***Overall Mean - 35%***

Description: Student Perspective

Table 5.5 shows that comparing source of finance with the importance of resources and experiences produced the second highest number of significant differences after type of doctorate. This means that how the student is financed has affected how important students perceived these resources to be. Clearly the opinions of the research council funded students differ greatly from the self-funded and employer funded students. Both these comparisons show that the students viewed eight resources as having significantly different importance. For example 'research expenses' was only considered as 'quite important' by self funded students but 'very important' by research council students. 'Peer support' was also only viewed as 'quite important' by self-funded students but 'important' by research council students. For nearly all of the resources where these students have viewed them in different ways, the research council funded students have considered them as more important than the self funded group. In the research council and employer comparison, virtually the same resources created significantly different responses. For example, 'research expenses' was also only viewed as 'quite important' by employer funded students in contrast to the research council opinion. The employer funded and self-funded students had similar views of how important these resources are during a doctorate and their comparison is evidence of this. Only 'teaching opportunities' and 'appraisal' were viewed in significantly different ways. 'Teaching opportunities' were considered to be 'quite important' for self funded students but 'not important' by employer funded students who ranked this resource last. 'Appraisal' was also thought to be more important by self-funded students who rated it as 'important' in contrast to 'quite important'. These are obviously resources that were considered important features of a doctoral process by self funded students but less so by the employer funded category.

The research council and institutionally funded students also showed great similarity in their responses. Only 'subject specialist equipment' and 'appraisal' were considered in different ways. The specialist equipment was thought to be more important for the research council funded students who rated it as 'very important' and ranked it second. 'Appraisal' was also viewed as more important for the research

council students who rated it as 'important' as opposed to only 'quite important' for the institutionally funded students. These are clearly resources that are more important to the doctoral experience of the research council funded sample.

The fourteen resources receive a range of responses with no single resource being perceived entirely differently in each comparison. 'Subject specialist equipment' is the closest, which received significantly different results for every student comparison apart from self and employer. These students both perceived this resource as 'quite important' during a doctoral process. The remaining students however, perceived this in different ways. The research council funded students, who rated it as 'very important' and ranked it second, viewed it as most important.

In contrast, there were five resources that did not produce any significantly different responses. This shows that all students perceived them to be of similar importance during a doctorate, irrespective of their source of finance. All students regarded 'access to a library' as 'very important' and most rated it first with the exception of the institutionally funded students who placed it second. This was plainly a fundamental resource for all students to have during the course of a doctorate, and the unanimous student opinion shows that the source of funding does not affect how important this resource is. All students perceived 'an academic environment' to be 'important' but additional study as only 'quite important'. 'Personal skills development' was also viewed as 'important' by all students but 'business training' was 'not important' to all the students and generally ranked last in importance. This shows that none of the students regarded this as a critical component of a doctorate, regardless of their source of finance. Many of the other resources that were regarded in very similar ways were a result of the students viewing them as important features of a doctorate.

Description: Graduate Perspective

Again, as in Table 5.4, the graduates' responses were less affected by the source of finance than the students were. However, some interesting patterns emerged from their results. Library access was viewed as the most important resource for those

who had funded themselves, also the case for the students. This was also ranked highest in importance by research council funded students and graduates and by those who were employer funded. However disparity appeared between students and graduates who had been financed by an institutional bursary. While students rated peer support as their key resource, this was only considered 'quite important' by graduates. Graduates ranked subject specialist equipment highest in order of importance which had not been regarded as nearly so critical by the students. Despite this difference, business training, additional study and teaching opportunities consistently appeared low down on both students and graduates priorities.

Commentary

Table 5.5 clearly shows that the source of finance has significantly shaped student responses but had less impact on graduates' perceptions. Considerable differences are apparent in how important students have viewed these resources. The biggest differences in opinion exist between self-funded, research council and employer funded students. While self and employer funded students responded in very similar ways, the opinions of research council students differ greatly. This may affect the structure of doctoral programmes, depending on who funds the majority of the student population. For example, the self-funded students did not regard 'research expenses' as a critical resource. As a result of them funding their own doctorate, this additional expenditure is possibly seen to make little difference to their doctoral experience. However, for research council students this is an important resource to have. The fact that self and employer funded students have rated the majority of these resources as less important than research council and institutional bursary students, suggests that resources in general are a more important concern for these latter two groups. This has implications for how doctoral programmes are designed and what sources of funding are required for the student population.

The fact that the importance of 'subject specialist equipment' varied according to the source of funding shows that this resource is significantly more important for research council and institutional bursary candidates. It is also known that the majority of those funded by these sources are currently or have already pursued

natural science PhDs. Obviously specialist scientific equipment is central to these candidates, but much less so for those who are self or employer funded, doing either professional doctorates or PhDs in education and the social sciences.

'Access to a library' is evidently the most important resource for all candidates, irrespective of their funding source. 'An academic environment' and 'personal skills development' were also seen as core requirements for a doctorate, again showing that the social and individual growth aspects of undertaking any doctorate are paramount to all candidates. This is in contrast to 'business training' which no-one viewed as crucial to their doctoral experience.

Table 5.6: Comparison of age on completion and the importance of resources and experiences to students (by *t*-test)

Resources and Experiences	**Under 25 and 25-30**	**Under 25 and 31-40**	**Under 25 and 41-60**	**Under 25 and 61+**	**25-30 and 31-40**	**25-30 and 41-60**	**25-30 and 61+**	**31-40 and 41-60**	**31-40 and 61+**	**41-60 and 61+**	***Percentage of significant values***
Library access	NS	4%	NS	NS	NS	8%	NS	0.4%	NS	NS	***30%***
Regular supervision	NS	NS	3%	NS	NS	NS	NS	8%	NS	NS	***20%***
Computing facilities	NS	NS	<0.1%	NS	NS	1%	NS	10%	NS	NS	***30%***
Subject specialist equipment	5%	2%	<0.1%	NS	NS	<0.1 %	NS	0.1%	NS	NS	***50%***
Research expenses	0.2%	10%	<0.1%	NS	NS	<0.1 %	NS	<0.1 %	NS	NS	***50%***
Conference access	NS	NS	1%	NS	NS	6%	NS	NS	NS	NS	***20%***
Peer support	7%	4%	NS	NS	NS	NS	NS	NS	NS	NS	***20%***
Academic environment	NS	NS	NS	NS	NS	NS	NS	6%	NS	NS	***10%***
Teaching opportunities	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	***0%***
Additional study	NS	0.9%	NS	NS	0.1%	NS	NS	2%	NS	NS	***30%***
Personal skills development	NS	NS	NS	NS	NS	NS	NS	NS	1%	NS	***10%***
Appraisal	NS	NS	NS	1%	NS	NS	0.4%	NS	NS	0.3%	***30%***
Work experience	NS	NS	2%	NS	NS	NS	NS	NS	NS	NS	***10%***
Business training	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	***0%***
Percentage of significant values	***21%***	***36%***	***43%***	***7%***	***7%***	***36%***	***7%***	***50%***	***7%***	***7%***	***Overall Mean - 22%***

Description: Student Perspective

Table 5.6 shows that comparing students' age on completion with the importance of resources and experiences has produced the lowest overall mean percentage of significantly different responses. This means that age has had the smallest effect on shaping student responses. It also shows that this table has the greatest number of similar responses. Clearly many of the resources were considered to be of similar importance to the doctoral process, irrespective of the students' age.

Comparing the 31-40 and 41-60 age groups produced the highest number of significantly different responses. Clearly, these two student groups perceived half of the resources in different ways. In contrast, five age group comparisons all produced the lowest results. The under 25 and 61+, the 25-30 and 31-40, the 25-30 and 61+, the 31-40 and 61+ and the 41-60 and 61+ comparisons only viewed one resource to be of significantly different importance. These student groups clearly had very similar opinions of the resources and experiences that should be central to a doctorate. They all perceived 'access to a library' as 'very important' and ranked it highest. They all viewed 'teaching opportunities' and 'business training' as 'not important' and ranked them last, with the slight exception of the 61+ category. Library access is viewed as a critical resource irrespective of the student age, whereas the other factors are not.

A range of responses was obtained for the fourteen different resources and experiences, but no single factor resulted in complete disagreement over its importance. The closest was 'subject specialist equipment' and 'research expenses', of which half of the student comparisons disagreed over. Both of these were viewed as 'very important' for the under 25 students but only 'quite important' by the 41-60 group. Clearly, these are resources central to these young students' doctoral experiences but less so for this older age group.

In contrast 'teaching opportunities' and 'business training' failed to produce any significantly different results. All students perceive these to be of similar importance to the process of a doctorate. As highlighted above, this is because most of the

students did not consider these resources to be important to the doctoral process. The 61+ age group was the only slight exception which viewed 'teaching opportunities' to be 'quite important' and ranked it higher than the other student age groups.

The remaining resources show that there was a high degree of similarity in how students viewed them. Most only have one or two student comparisons that have significantly different perceptions of how important the resource is. There is consequently considerable agreement as to what resources and experiences should be central to a doctorate and the age of the student has not had a profound effect on responses.

Description: Graduate Perspective

Age on completion also produced the fewest number of significantly different results among the graduates' responses. The resource to create the greatest difference in opinion was the availability of research expenses. In general this declined in importance with the age of the graduate. Graduates under 25 regarded this as fundamental to a doctoral process, but those over 61 viewed this resource as completely unimportant. This was a pattern also shown in the student responses. In contrast, library access featured as a pivotal resource within the responses of graduates of all ages. Again this was reflected by the students' opinions. The views of graduates mirrored to a large extent those of the students.

Commentary

Table 5.6 clearly shows that the age on completion has had the least bearing on how important both students and graduates perceived these resources. Many of them were viewed as being of similar importance during the process of a doctorate, regardless of the students' ages. Library access appears to be one of the most important resources for candidates of most ages. This has implications for designers and co-ordinators of doctoral programmes as access to this resource must clearly be ensured for all age groups. However, in general there are few ramifications for the structures of doctorates given that age does not significantly affect how candidates responded.

Discussion

This section has explored student perceptions about the importance of fourteen resources and experiences during a doctoral process. The purpose of this discussion is to show the factor that had the most effect on students' responses and how it related to the perceived importance of these resources. The discussion identifies the resources that created disparity among students' opinion and those that resulted in the most agreement. By exploring these issues, some of the core components of doctoral processes emerge as well as those perceived as less appropriate to a doctoral experience.

The tables shown previously in this chapter revealed that 'type of doctorate' had the most influence on student responses. Interestingly this was also the factor that had the most significant effect on graduates' responses. The factor to have had the least impact on how students responded was their age on completion. Again this pattern was reflected in the graduates' responses. The perceived importance of these resources was not significantly influenced by how the age of candidates, but did depend on what kind of doctorate was undertaken. The following 14 figures show how students and graduates have perceived these resources, according to the doctoral programme. This discussion is divided into three main sections. The first deals with those resources that have resulted in the greatest disparity. The second examines those that were unanimously viewed as important and the third looks at resources regarded as unimportant.

Resources and experiences resulting in the greatest disparity

Figure 5.1. Candidates' responses and 'subject specialist equipment'

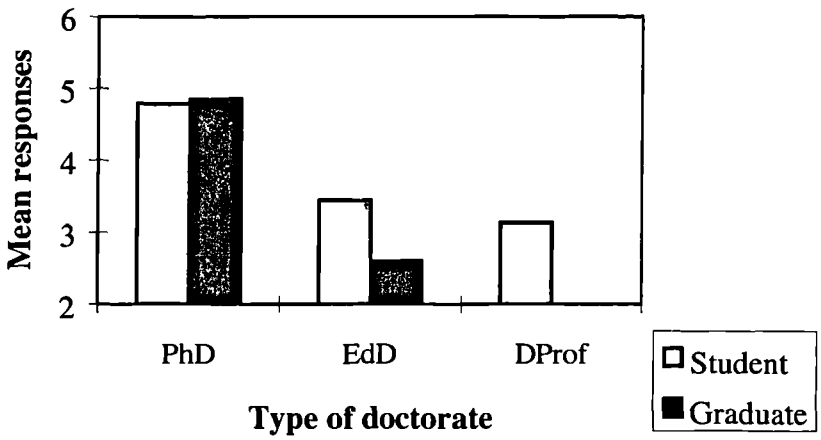


Figure 5.1 demonstrates that 'subject specialist equipment' created the greatest variation in student responses. Clearly this was a resource much more important for PhD students than for those in either of the professional doctoral categories. This opinion was mirrored by the graduates but Figure 5.1 shows a more exaggerated pattern. The lack of value attributed to this resource by professional doctoral candidates, may be because any specialist equipment required is provided within the place of work and is therefore not viewed as an additional resource. Alternatively, it could be that little specialist equipment is needed during the process of these professional doctorates. Much of the research undertaken on the EdD and DProf appears to focus on management, and training and development aspects of organisations, that largely relies on people being the key resource. This is also true of PhDs in the social sciences where specialist resources are minimal. However, a PhD experience in the natural sciences appears to be quite different and given that a large proportion of this PhD sample has been taken from two science institutions, it is likely that this has affected the result. Specialist scientific equipment is a fundamental part of being able to successfully undertake a PhD in the natural sciences where a large proportion of the experiments are made possible because of particular facilities. This makes this resource vital to the PhD process. If professional doctorates with a particular medical or technical emphasis had been examined, opinions concerning this resource may have differed. However, as these

programmes are not specifically designed for career preparation, but focus instead on the professional development of senior professionals, human related resources may still remain predominant.

Figure 5.2. Candidates' responses and 'research expenses'

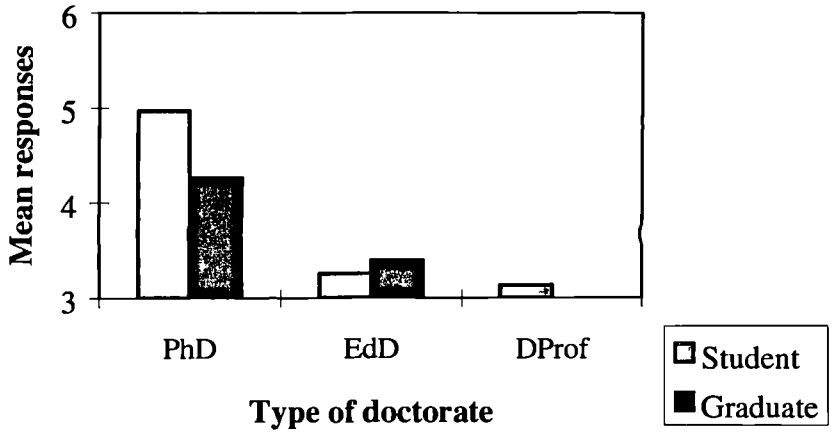


Figure 5.2 shows that research expenses is again a significantly more important resource for PhD students and graduates than for those professional doctoral candidates. This may be because students on professional doctorates are normally employed and are more likely to have disposable income to assist with research expenses. These students often receive some financial support from their employer who may also contribute to additional expenses. PhD students are more inclined to depend on a research council bursary or be self-funded. They are also more likely to be full-time and in the early stages of their careers with few financial resources to draw upon. This may make them dependent on institutional funding for additional research expenses.

Certainly for PhD students, Figure 5.2 suggests that financing research expenses is critical for successful completion (although graduates viewed it slightly less important). Clearly the grant or bursary that these students received, did not cover additional expenditure necessary during their doctorate. Not having access to research expenses could hinder and impair the quality of the doctoral experience, since activities necessary for the success of the research and for the personal development of the student, may not be able to be undertaken. This is a critical

matter for institutions to bear in mind when considering the total cost of a research student, the level of institutional investment, and the kinds of resources that should be made available.

Figure 5.3. Candidates' responses and 'conference access'

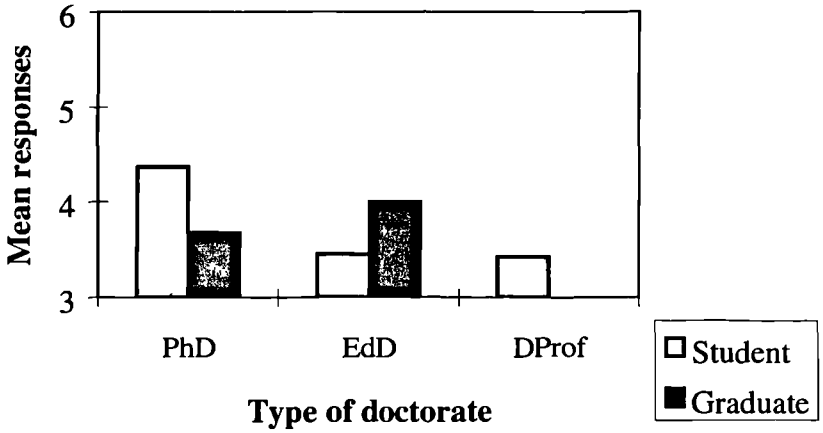


Figure 5.3 shows a similar pattern to 5.1 and 5.2 because 'conference access' is significantly more important to the PhD students than to those on either of the professional doctorates. This is an experience which could be classified as an additional research expense and, without funding, would not normally be available to students. The PhD students regarded this as an important part of their doctoral experience. Perhaps if they are young and aiming to pursue an academic or research related career, they may see the dissemination of their own work and the development of a professional network as crucial. This figure suggests that professional doctoral students do not share this view. As these students are more likely to be mature professionals, a network of colleagues will probably already exist. Most of them will not be aiming to pursue an academic career and evidently view this experience as having less relevance to their doctoral programme.

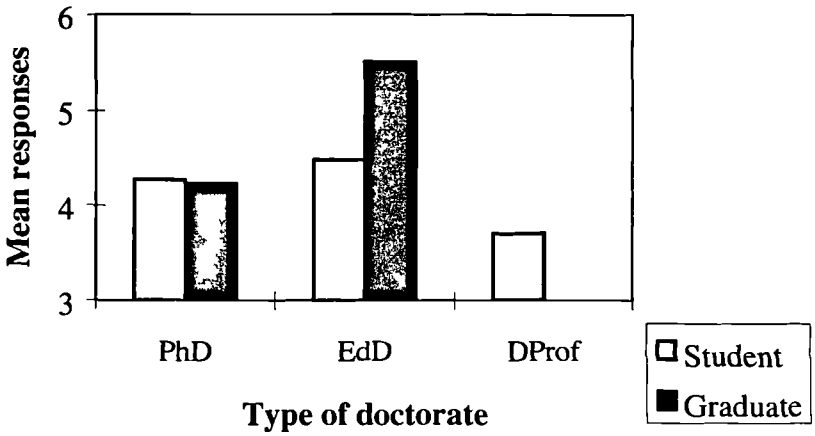
Attending conferences is clearly an experience these PhD students would like to be encouraged to do. Done selectively, this can be an invaluable part of a doctoral experience and an integral part of personal development. By presenting work at meetings, attendance costs are usually reduced and may make it more feasible for students to be institutionally supported. It is interesting that no professional

doctorate students viewed this experience as outstandingly important. However, the noticeable value given to this resource by EdD graduates suggests that in hindsight, conference access would have played a constructive role in the doctoral process. As more of these programmes emerge, it may give rise to conferences that are particularly focused on the dissemination of these candidates' research. These conventions may consequently be of a different orientation and structure and may attract a distinct population. On the other hand, professional doctoral students could be encouraged to attend and present at existing conferences to publicise the significance and magnitude of their work. This process may help to raise awareness about the types of research undertaken on these programmes.

The following six figures show resources that were generally perceived as important by candidates, regardless of the type of doctorate undertaken.

Resources and experiences unanimously viewed as important

Figure 5.4. Candidates' responses and 'an academic environment'



'An academic environment' shown above in Figure 5.4, and 'personal skills development' shown below in Figure 5.5, both created the least variation in responses. Both experiences were regarded as important components of a doctoral process. What is significant from Figure 5.4 is that an academic environment is important for the experience of professional doctoral candidates as well as those on a PhD. While the focus of their research is more professionally orientated, the

academic context or university environment is crucial. However this is apparently slightly less important for the DProf students. It is possible that their programmes are more work based than the EdD students and that the professional environment is considered of equal importance to the academic. The significant difference between EdD students' and graduates' responses is also striking. This suggests that with hindsight the graduates really appreciated the academic environment, and could see how it had benefited their doctoral experience.

Figure 5.5. Candidates' responses and 'personal skills development'

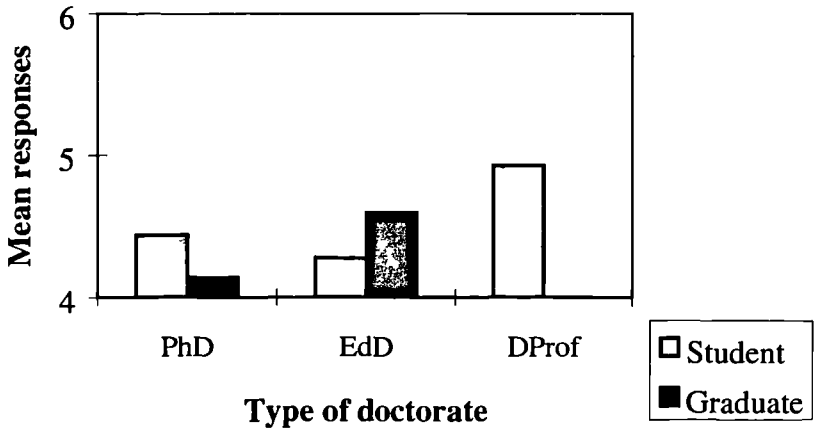
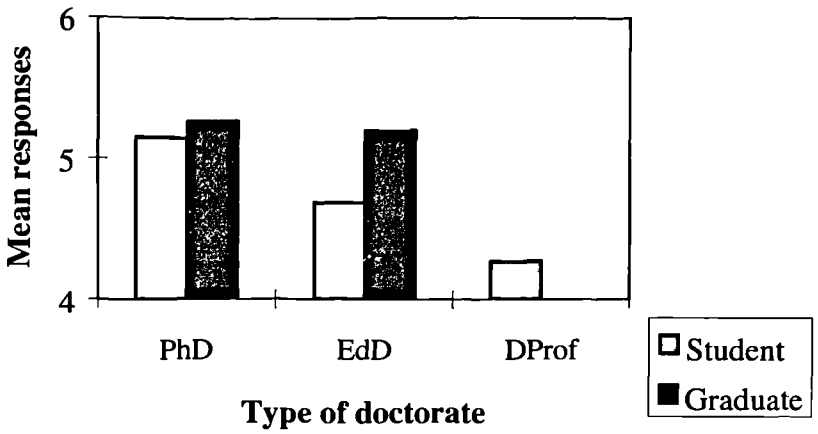


Figure 5.5 above, shows a reverse pattern to that displayed in Figure 5.4. The DProf students clearly viewed personal skills development as a more important doctoral component than the other students. This suggests that they would consider personal development as an important motivation for beginning doctoral study, and that they would expect the development of personal skills to be included within their programmes. However, all the students have perceived this as an important doctoral experience and not just those on a DProf programme. This has implications for both the structure and content of a doctorate and for how 'personal skills' is defined. If this would differ depending on the students' programme type and research context, is unknown. Whether the development of personal skills is made an explicit component of a doctorate, or if it should be implicitly incorporated throughout the experience, is debatable, and may depend on what is regarded as 'personal skills'.

Figure 5.6. Candidates' responses and 'regular supervision'



What is interesting from Figure 5.6 is the greater importance given to supervision by the graduates. This indicates that a similar trend could be apparent for potential DProf graduates. Clearly on reflection, graduates recognise that this formed a pivotal experience during their doctorate. Another significant feature is the slightly less importance given to supervision by professional doctoral candidates. Maybe this is because advice is also provided by their professional colleagues and the reliance upon the academic staff for guidance, is not total.

Figure 5.7. Candidates' responses and 'computing facilities'

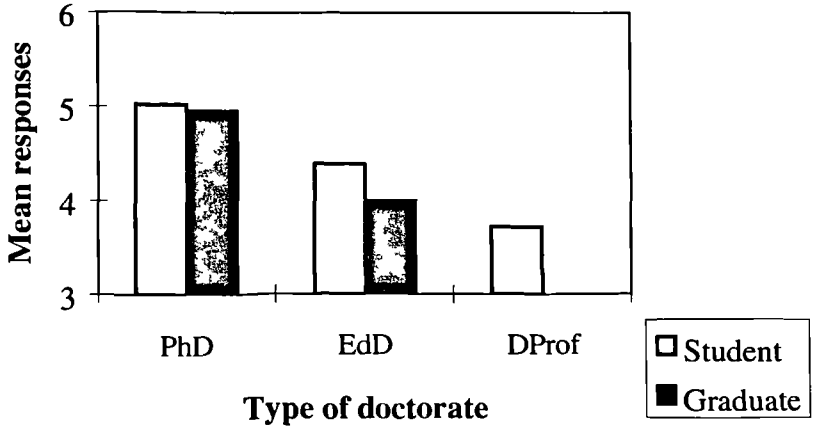


Figure 5.7 shows that access to computing facilities is again perceived as a core resource within each type of doctorate. However, professional doctoral candidates attributed slightly less importance to this resource than those associated with a PhD. This may well be because these facilities are provided at work and are not regarded as an additional resource. Given the seniority of some professional doctoral candidates, they may well have assistance with their administrative responsibilities. This possibility of reduced contact with computers may affect how important they regard this resource.

Figure 5.8. Candidates' responses and 'access to a library'

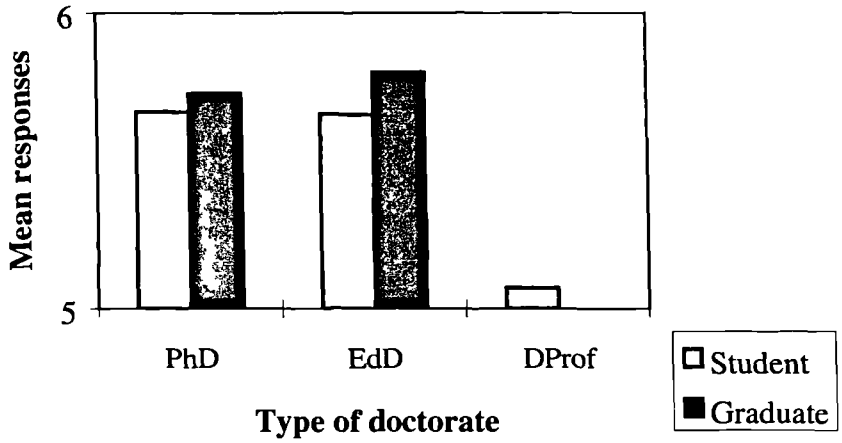
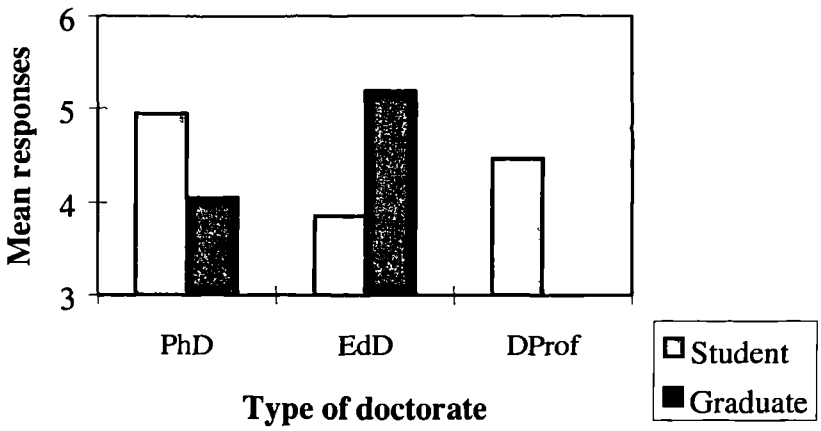


Figure 5.8 demonstrates the fundamental importance of library access during a doctorate. Two significant features are shown in this figure. The first is the greater importance given to this resource by graduates. This suggests that in hindsight, contextualising ideas and results by reading, was more important than perhaps realised during the process of conducting the doctorate. Another identifiable feature is the slightly less value given to this resource by DProf students. This may be because many students are currently in the early stages of their programmes where contextualising the thinking has not begun to occur. It may also be due to the different nature of the research, that makes professional literature more relevant than academic. However, candidates must be aware of the breadth and depth of understanding that is obtainable from reading around the specific focus of their programme. Perhaps this is something that needs to be explicitly addressed within the structure and delivery of this programme.

Figure 5.9. Candidates' responses and 'peer support'



Peer support is clearly regarded as a core doctoral process by both students and graduates. It is interesting how valuable the EdD graduates perceived it to be. This programme certainly has an emphasis on collaboration and working with other candidates, so this result suggests that this has been very beneficial. However, it may be that these results do not reflect individual experiences, but instead highlight ideal characteristics of what a doctorate should include. Not all candidates have the benefit of interacting with peers, especially those studying on a part-time or distance learning basis. Peer support is plainly an important resource to consider structuring into all types of doctorates, given the value attributed to it by all candidates.

Figure 5.10. Candidates' responses and 'appraisal'

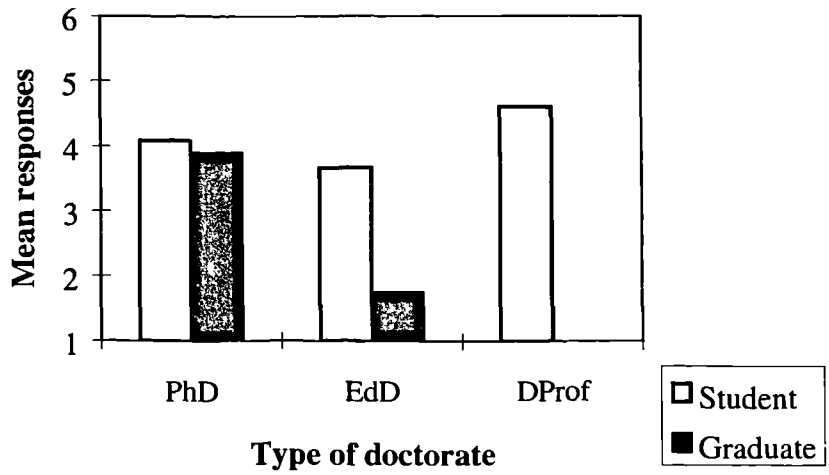


Figure 5.10 shows an interesting pattern of responses. Evidently appraisal is regarded as important by most candidates. Being regularly monitored and reflecting and planning on research experiences, are viewed as valuable components of a doctoral process. The obvious importance placed on appraisal by candidates, is perhaps something not always acknowledged by supervisors and doctoral developers. This has implications for the structure of programmes and how the recording of progress is organised. The tracking of students would appear to be the responsibility of the supervisor, but how formal this is made, and if any institutional sanctions are built round this process (both for supervisors as well as students), are important issues to consider.

It is noticeable from Figure 5.10 that the DProf students regard appraisal as more important than the other candidates. Maybe this is because it reflects professional practice. The inter-relationship of employers' needs and university requirements, necessitates negotiation between the candidates, employers and university staff. Formally reviewing progress and assessing the development of the project work is therefore an integral process for candidates to engage in. In contrast the EdD graduates were less enamoured with appraisal. Whether this is due to negative experiences during their programmes, or whether they simply regard it as inappropriate during a doctorate, is unknown.

Resources and experiences that were unanimously viewed as unimportant

The following four figures show that while candidates expressed similar views about these resources, they have clearly considered them to be of little importance to a doctoral process. Teaching opportunities, additional study, work experience and business training are all regarded as inappropriate or unimportant features of these doctoral programmes.

Figure 5.11. Candidates' responses and 'teaching opportunities'

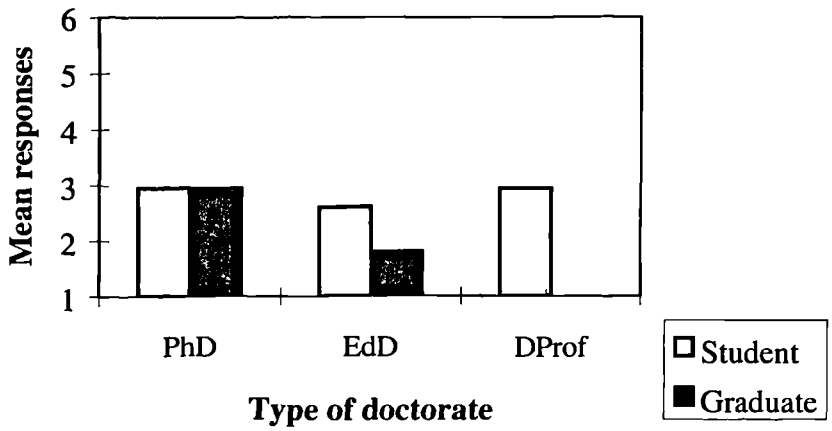


Figure 5.11 is the resource that all candidates agreed as being of minimal importance, irrespective of their type of doctorate. It was consistently ranked last in order of importance by both students and graduates. This may be because teaching is viewed as a time consuming experience which does not necessarily have any direct relationship to the focus of their doctoral research. Also it may not equate with candidates' career intentions. If they are not intending to teach in a school, college or university environment, the perceived value of this experience may be considerably affected. This negative view may also arise if no constructive training on how to present, hold seminars or lecture is given during the doctorate. If this is the case, candidates may feel inadequately equipped for this responsibility that could significantly affect how this resource is viewed.

Certainly for professional doctoral candidates, exposure to teaching may be perceived as having little relevance because they are already employed, and could either already have this experience or may not perceive it as appropriate to their career development. This graph shows that EdD candidates viewed teaching opportunities as the least important. It is highly likely that they come from a teaching or educationally related background and consider that they have had this experience already.

Given that so many PhD students are expected to embark on some form of teaching activity (certainly for those in receipt of a bursary), these results suggest that they are not all entirely happy or committed to the activity. If the experience was designed to be a more integral part of students' total expertise, they may not necessarily view it as a distracting burden. Or, if appropriate training was provided for students on how to teach, they may view the experience as less remote from their total doctoral capability. Clearly the importance of this resource may vary according to the students' purposes for undertaking doctoral study. However, the unanimous lack of value attributed to teaching opportunities, demonstrates that these students would rather not experience any teaching during their doctoral process.

Figure 5.12. Candidates' responses and 'additional study outside the research programme'

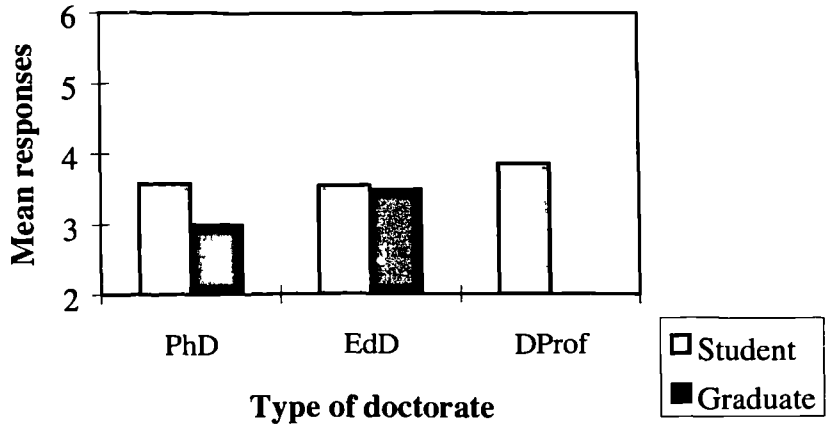


Figure 5.13. Candidates' responses and 'work experience'

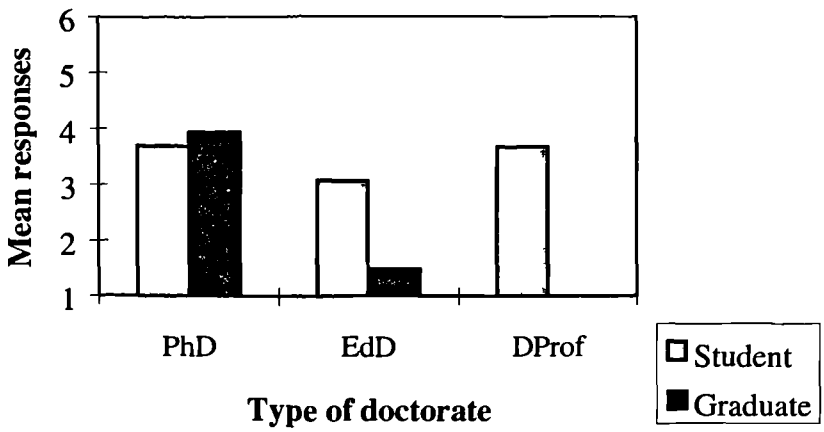
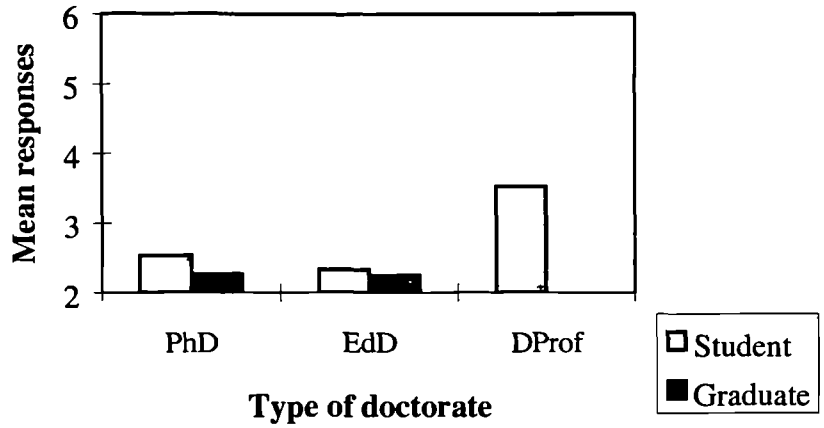


Figure 5.14. Candidates' responses and 'business training'



The lack of importance given to any additional study, work experience and business training clearly shows that these are also not considered by any of the students as important components of a doctorate. This may also be a result of these experiences being perceived as separate and distracting from candidates' research. This suggests that students are very conscious of the time spent and duration of their doctoral study, and are quite single-minded about pursuing it. It also shows shared, clear ideas about some features that are evidently not seen as necessary or relevant for any doctoral programme.

It can be seen from Figure 5.12 that the DProf students viewed additional study slightly more importantly, suggesting that they are perhaps more willing to spend longer on their doctorate and have a broader and fuller programme. The fact that the EdD students consider work experience to be of less importance than the other two categories of students cannot be easily explained. Clearly because these are students on a professional doctorate, they are already employed and experienced. But the DProf students, also in the same position appear to think that this resource is slightly more important. Similarly the DProf students regard business training as more important than both the other two sets of students, even though none of them view this experience as fundamental to a doctorate. It is not known how the DProf students would view business training as part of a PhD process, or if their view is restricted only to professional doctorates.

Conclusion

- Candidates agreed on important resource requirements
- Candidates agreed on unimportant resources

The most significant outcome of this analysis has been the very clear views of both students and graduates about the processes that should be part of a doctorate. The resources and experiences tended to either be perceived as fundamental to the doctoral process, or not at all important with few creating feelings of indifference. For example, commercially orientated experiences such as business development or work experience were unanimously regarded as unimportant. This may well be an issue that causes tension between other stakeholders, non-academic employers in particular. Certainly at first degree level, criticisms have been raised about graduates' lack of business acumen. This may be something that is equally attributed to doctoral level. The results also showed firm agreement between students and graduates over what factor most affected the importance of these resources. The type of doctorate obviously shaped the nature of the experiences required and the resources that benefited the process.

An interesting pattern has appeared from these results that could have significant consequences for how doctoral programmes of different kinds are structured and orientated. Resources such as specialist equipment, research expenses, conference access and computing facilities were all rated as more important by the PhD candidates compared with those involved on professional doctorates. Clearly these are resources that have direct financial implications in order for them to be available. In contrast, professional doctoral candidates appeared less concerned with these and placed more attention to the academic environment, peer support and appraisal. From the candidates' perspective, this suggests that a PhD should be more focused on technical aids and professional doctorates should be more attentive to the total experience had by students. This means that a PhD would have to be much more resource-intensive and professional doctorates more experientially intensive, in order to maximise the process from the candidates viewpoint. This relates to some of the findings discussed in Chapter 4 that explored candidates' motivation. In general,

there are more people undertaking PhDs with the desire to learn technical research skills and developing and establishing a research career. The emphasis shown in this chapter has followed this trend and has highlighted particular resources that are perceived to enhance this. In contrast, professional doctoral candidates are far more interested in personal development and consequently emphasise the experiences had during the doctorate, rather than the resources.

This accentuation of slightly different features of a doctoral process creates different kinds of demands. The resource-intensive nature of processes within a PhD clearly has direct financial implications. If these facilities are considered appropriate and necessary by those responsible for administering doctoral programmes, a financial source would have to be found. This could affect students' fees which consequently may make a doctorate that provides these resources more exclusive and competition greater. This is already the case in some institutions and indeed these results may reflect the prestige of some of the case studies used in this research. Greater collaboration between university and industry may be a solution where a greater interaction and sharing of each other's resources occurs. This could obviously be an efficient and effective use of facilities and also of expertise. The CASE awards are evidence that this already exists to some extent, even though Figure 5.13 shows that candidates placed little importance on work experience itself.

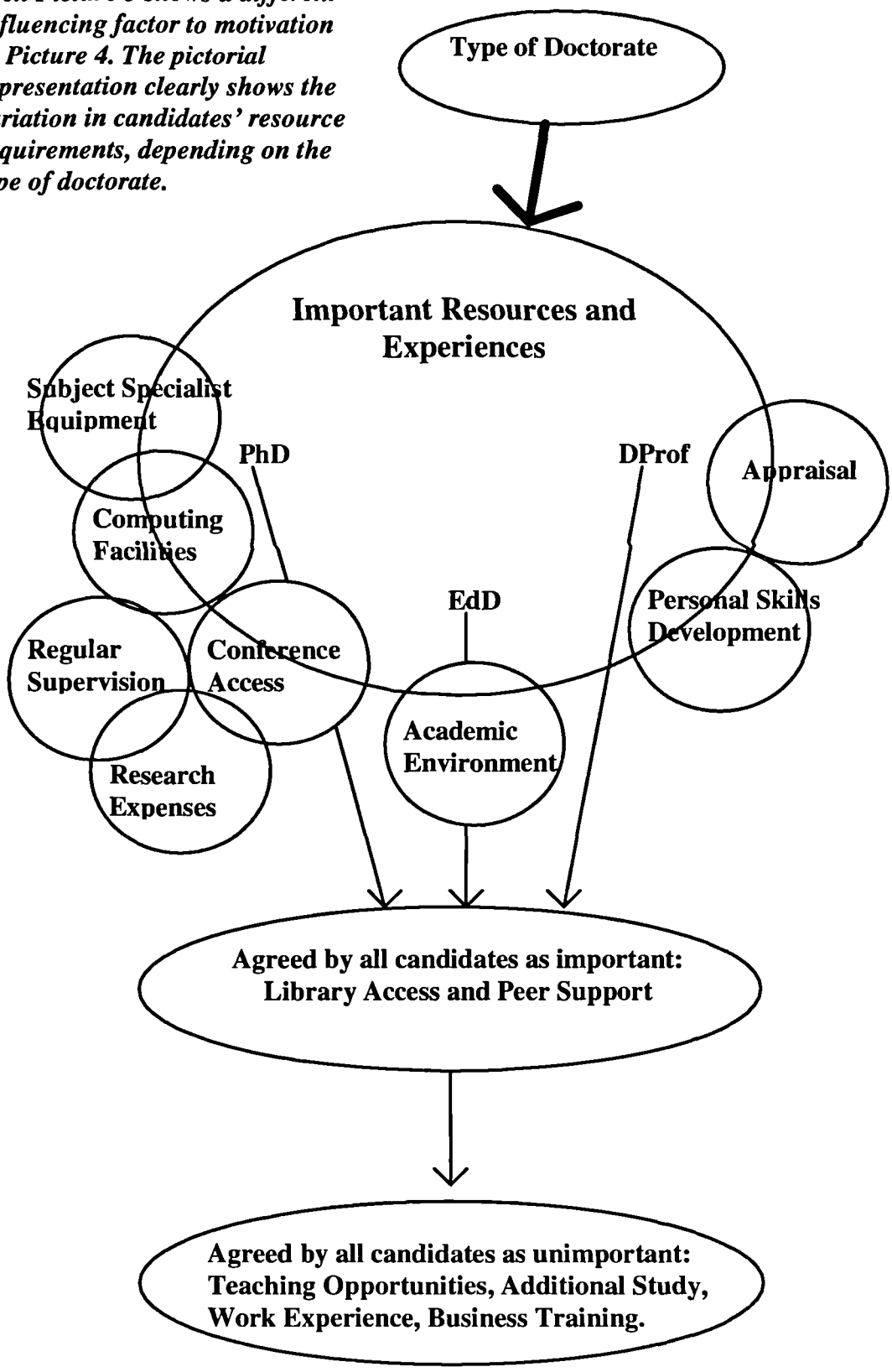
In contrast the demand placed on professional doctorates by this emphasis on the more qualitative and experientially orientated processes, is slightly different. Rather than being directly costly in terms of technical equipment, time may be the most expensive resource. There was a clear demand for regular supervision, interaction among peers and the experience of an academic environment. The organisation of these programmes may be required to be more collaboratively structured than some PhDs with an emphasis on developing communities. Evidently some professional doctorates are already doing this, but this requires a different type of expenditure to that shown in the PhD.

Having made these statements, sweeping generalisations are not intended and clearly there are resources and experiences regarded as critical components of any doctorate. However, the adoption of a more consultative approach by programme designers may be an outcome of this discussion. By taking both student and graduate views of the processes involved in doing a particular type of doctorate, resources and experiences most valued by candidates would be revealed. Different institutional contexts and different subject areas may for example significantly alter resource requirements. By engaging candidates in the development of doctorates, more responsive programmes could be ensured.

Rich Picture 5 highlights the particular importance of various resources, depending on the type of doctorate undertaken. It also tries to show those resources and experiences commonly viewed upon by all candidates, those considered unanimously important as well as those agreed upon as unimportant.

Rich Picture 5: Understanding Candidates' Resources and Experiences

Rich Picture 5 shows a different influencing factor to motivation in Picture 4. The pictorial representation clearly shows the variation in candidates' resource requirements, depending on the type of doctorate.



Chapter 6 Candidates' Ways of Working

Introduction

Chapter 6 explores candidates' opinions of different ways of working. Together with the previous examination of how candidates value different resources and experiences, this chapter provides an insight into the perceived importance of different roles and relationships during the doctoral process. The structure of this analysis follows a similar pattern to the previous two chapters, with the student perspective forming the core and the views of graduates used as comparisons.

Table 6.1: Comparison of type of doctorate and students' ways of working (by *t*-test)

Ways of working	PhD and EdD	PhD and DProf	EdD and DProf	*Percentage of significant values*
Working independently	NS	NS	NS	*0%*
Joint working with researchers	5%	NS	NS	*33%*
Collaborating with colleagues	2%	NS	NS	*33%*
Percentage of significant values	*67%*	*0%*	*0%*	***Overall Mean - 22%***

Description: Student Perspective

Table 6.1 shows that comparing type of doctorate with students' ways of working produced a very low overall mean percentage of significantly different responses. This is indicative of the limited effect the doctoral type had on how students viewed these three ways of working and indicates substantial agreement about the importance of these ways of working. It is clear from the table that the PhD and DProf, and EdD and DProf comparisons produced no differences. These students rated all three factors as either 'important' or 'very important', irrespective of their type of doctorate. All students ranked 'working independently' first in order of importance and 'joint working with researchers' last. The greatest differences of opinion were between the PhD and EdD students, where the PhD students attributed slightly greater importance to all three ways of working.

'Working independently' created no significantly different responses showing that all students agreed on its importance. As highlighted above, all students ranked this as the most important factor, the majority rating it 'very important' during a doctoral process. Similarly, both 'joint working with researchers' and 'collaborating with colleagues' were both agreed as important with slight variations in the PhD and EdD comparison.

Description: Graduate Perspective

As there have not yet been any graduates from the DProf, comparisons involving this group were not possible. However, examining the relationship of PhD and EdD graduates was still viable and showed a slightly different pattern from that of the students. Type of doctorate had the least influence on how graduates responded, compared with all other variables shown subsequently in the five Tables. No significant differences were produced by comparing the opinions of PhD and EdD graduates, as they shared similar views. Graduates from both programmes rated working independently as 'very important', but also regarded the other processes as important. Clearly this is virtually identical to the students' views, suggesting that completing a doctorate had little effect on how these ways of working were viewed.

Commentary

The type of doctorate evidently had little effect in shaping candidate opinion. Considerable similarity between the student and graduate perspectives emerged, showing that all three ways of working are paramount to candidates' doctoral processes, regardless of the type of programme undertaken. Whether they have actually played a significant role in all candidates' experiences is unknown but clearly they are perceived as crucial by those associated with both professional doctorates and PhDs. This has implications for how both kinds of programmes are structured and organised and also for the academic context that the student is placed in. Evidently all these students require opportunities to work independently and in a variety of collaborative roles.

Interestingly, all candidates ranked 'working independently' highest and therefore viewed it as slightly more important than the other two ways of working. This

suggests that working independently is regarded as a critical feature of either a professional doctorate or a PhD. How this is encouraged and developed during the process of a doctorate and how working independently relates to the other ways of working could be issues that need examining by doctoral designers and deliverers. Also what working independently means and if this process is actually associated with successful collaboration, could be explored in relation to programme design.

Table 6.2: Comparison of institution and students' ways of working (by *t*-test)

Ways of working	**Middlesex and Imperial**	**Middlesex and Bristol**	**Middlesex and NIMR**	**Imperial and Bristol**	**Imperial and NIMR**	**Bristol and NIMR**	***Percentage of significant values***
Working independently	NS	NS	NS	NS	NS	NS	***0%***
Joint working with researchers	NS	NS	<0.1%	NS	6%	<0.1%	***50%***
Collaborating with colleagues	NS	NS	<0.1%	6%	3%	<0.1%	***67%***
Percentage of significant values	***0%***	***0%***	***67%***	***33%***	***67%***	***67%***	***Overall Mean - 39%***

Description: Student Perspective

Table 6.2 shows that comparing the institution with different ways of working produced a higher number of significantly different results than Table 6.1. This shows that the institutional affiliation of the students had a more profound affect on how they viewed these ways of working than the type of doctorate did. It is also evidence of greater disagreement about how important independence, joint working and collaborating are.

Three comparisons have produced the equal highest number of differences; Middlesex and the NIMR, Imperial and the NIMR and Bristol and the NIMR. Clearly students from the NIMR have significantly different views to those from the other institutions. The ranked mean responses support this claim and show that the NIMR students rated all three ways of working as 'very important' placing 'collaborating with colleagues' first in order of importance and 'working independently' lowest. In contrast, students from all other institutions ranked 'working independently' highest and 'joint working with researchers' last. Table 6.2 shows that comparing student responses from Middlesex and Imperial and Middlesex and Bristol produced no significantly different results. Their views of these ways of working are almost identical.

All students rated 'working independently' as 'very important' and clearly perceived this to be the most valuable way of working. 'Collaborating with colleagues' produced the greatest disagreement over its importance although to varying degrees, all students considered it to be important.

Description: Graduate Perspective

Overall, the institutional affiliation of graduates had a slightly smaller influence on how they responded compared with the students. Views expressed by the graduates generally considered the three ways of working as slightly more important than the students. The pattern of graduates' responses for each individual way of working is almost identical to the student profile. No significantly different results were obtained for working independently because it was generally viewed as very

important, just as it was by the students. The most striking shift in opinion was between the Imperial students and graduates. Independent working was ranked as the most important process by students, but was replaced by joint working by graduates. Although this has not been a longitudinal study, the experience of completing a doctorate at Imperial may have altered candidates' views of these ways of working. Why this should be the case and why only at this institution is not clear.

Commentary

Table 6.2 has shown that students' institutional connection has caused slightly more variation in opinion than the type of doctorate. As shown in Table 6.1, few significant variations existed between the views of students and graduates. All students regarded each of the ways of working as important during a doctorate. However it was interesting to note that the NIMR students viewed these ways of working significantly differently to students from the other institutions. Collaborating and joint working are considered as more central to their concepts of a doctorate than the other students. 'Working independently' while still 'very important' is not viewed as significant as the other two ways of working. It is possible that these opinions are the result of different doctoral experiences at the NIMR. If a doctorate is structured to be more group orientated and if students are actively encouraged to collaborate, this could affect how they rate these different ways of working. This may have implications for how doctoral programmes are marketed and how the selection and recruitment of students takes place. Evidently students from the other institutions are more concerned with working independently and would seek a doctorate that promoted that ability. However, this process is a core characteristic of a doctorate given that all students considered working independently as important.

Table 6.3: Comparison of subject area and students' ways of working (by *t*-test)

Ways of working	Social Science and Education	Social Science and Science	Education and Science	*Percentage of significant values*
Working independently	NS	NS	NS	*0%*
Joint working with researchers	NS	0.1%	0.1%	*67%*
Collaborating with colleagues	NS	0.5%	0.1%	*67%*
Percentage of significant values	*0%*	*67%*	*67%*	***Overall Mean - 44%***

Description: Student Perspective

Table 6.3 shows that comparing the subject area with students' ways of working has produced the equal highest overall mean percentage of significantly different results. This has clearly had the biggest influence on how students have responded. It also demonstrates that there has been the greatest disagreement about the importance of these ways of working, depending on the students' subject.

Table 6.3 shows a similar pattern of responses for students from both the social sciences and education. They viewed 'working independently' as 'very important' and ranked it highest in order of importance, and both ranked 'joint working with researchers' last. In contrast the science students viewed 'collaborating with colleagues' as their most important way of working but similarly ranked 'joint working with researchers' last. However, the science students rated all three ways of working as 'very important', which was not the case with the other students. The value they attributed to these ways of working was more varied.

'Working independently' was the only way of working not to produce any significantly different results. This was because all students viewed it as a 'very important' part of a doctoral process. Clearly the subject area had no effect on how important students perceived this factor to be, indicating that this is a core feature of students' doctoral experiences.

Description: Graduate Perspective

The subject area of graduates had a greater effect on shaping their responses than shown in either of the previous two tables, but a significantly smaller influence compared to the students. Graduates all rated working independently as very important and considered it more valuable than either joint working or collaboration.

Several significant trends were apparent from the graduate results. Firstly, those from a science background viewed joint working and collaboration more importantly than the other graduates. This reflected students' views from this discipline. Secondly, those who had graduated from the social sciences regarded working independently as more important than those from either of the other two disciplines. There was also an interesting difference when the graduate responses were compared to those of the students. In general, the students viewed all these ways of working as slightly more important than the graduates. Whether or not this was because students were actively engaged in these processes when responding to the questions, and could therefore identify with their immediate value, is uncertain. However, while patterns of student responses are largely mirrored by the graduates, the degree of importance associated with these ways of working has slightly varied.

Commentary

The subject area of students had a profound affect on how they viewed these ways of working, but less influence on graduates' responses. While most regarded all three factors as either 'important' or 'very important', the ranking of them varied. The perceptions of the science students were considerably different from those from education and social science, a pattern reflected to some degree by the graduates. Interestingly both science students and graduates placed a higher value on collaborative rather than independent working, not the case for social science and education candidates. This has implications for the organisation and design of doctoral programmes. Clearly science candidates perceived collaboration as a more fundamental part of their doctoral experience and may want it actively built into their programme. This is not the case with those from social science and education, who appear more concerned with the ability to work independently. Evidently a distinct experience is had and expected by those studying in different subject areas. This raises a question about what kinds of working should be incorporated into a

doctorate and how much value is placed on each type. If social science and education candidates are not engaged in joint working or collaboration, they may not appreciate any value that can come from it. However, this assumes that those *responsible for designing and managing doctorates* in these disciplines, value collaboration as part of the doctoral process, which clearly may not be the case. Whatever the viewpoint, there are ramifications for programme design as emphasis on different ways of working may need to vary depending on the subject area and the needs of those involved. Somehow a compromise must be struck between student needs and the views of doctoral designers and organisers.

Table 6.4: Comparison of mode of study and students' ways of working (by *t*-test)

Ways of working	**Full-time and part-time**	**Full-time and distance learning full-time**	**Full-time and distance learning part-time**	**Part-time and distance learning full-time**	**Part-time and distance learning part-time**	**Distance learning full-time and distance learning part-time**	***Percentage of significant values***
Working independently	NS	<0.1%	2%	<0.1%	2%	0.1%	***83%***
Joint working with researchers	<0.1%	NS	NS	NS	NS	NS	***17%***
Collaborating with colleagues	0.1%	NS	NS	NS	NS	NS	***17%***
Percentage of significant values	***67%***	***3%***	***33%***	***33%***	***33%***	***33%***	***Overall Mean - 39%***

Description: Student Perspective

Table 6.4 shows that comparing mode of study with students' ways of working created slightly fewer significantly different results than Table 6.3. Mode therefore had some effect on how students responded but not as much as the subject area. The greatest difference of opinion was between full-time and part-time students. Although both groups of students ranked the three ways of working in the same order, the importance of them differed. Both full and part-time students ranked 'working independently' as the most important factor and 'joint working with researchers' least important. However, full-time students rated both working independently and collaboration as 'very important' and joint working as 'important'. Part-time students also rated independent working as 'very important' but collaborative working as 'important' and joint working as only 'quite important'. Full-time students evidently considered all three ways of working as more valuable to the doctoral process than part-time students. The remaining student comparisons yielded results of greater similarity. The students with the most closely aligned opinions were the full-time and distance learning full-time. However because of the small number of students in the latter category, generalisations are not possible.

Working independently is the process that created the most disagreement about its importance. This was because full and part-time students regarded it as more important than distance learning students. However, all students considered this a worthy feature of the doctoral process. Only the full and part-time students agreed that this factor was 'very important'. In contrast, the distance learning part-time students only viewed 'working independently' as 'important' and ranked it last in order of importance. However, despite this difference, all students considered this an important way of working during a doctorate, irrespective of their mode of study.

Description: Graduate Perspective

As there was no distance learning graduates in the sample, comparisons which included this mode were not possible. However, the full and part-time comparison for graduates was carried out and the same level of significant difference was found in both the graduate and student response. Graduates' mode of study created the

highest number of significantly different results and therefore had the biggest impact on how they responded. Similar to the students' responses in Table 6.4, the views on joint working and collaborating were the ones that caused differing views. Both sets of graduates regarded working independently as very valuable and ranked it first in order of importance. However, the graduates who had studied on a full-time basis considered joint working and collaborating as significantly more important than those who were part-time. Views clearly differed depending on the mode of study which reflected the pattern expressed by the full and part-time students.

Commentary

Table 6.4 shows that students' mode of study has had some influence in shaping their views but a significant impact on how graduates responded. The greatest difference in opinion has been between the full-time and part-time candidates. Although ranked in the same way, both full-time students and graduates generally perceived the ways of working during a doctorate as more important than part-timers. Evidently part-time candidates have different experiences compared to those studying full-time, which affects the value attributed to these ways of working. Certainly the opportunities for joint working and collaboration are fewer for part-time candidates but it is significant that they still consider them important. This has implications for how doctoral programmes are structured and organised for those participating on a part-time basis. These results show potential demand for collaborative activities as part of a part-time doctoral experience. This is something worth noting for the design of part-time PhD programmes and particularly for professional doctoral programmes, that are inevitably undertaken on a part-time basis. Full-time candidates clearly valued collaboration and independent working of equal importance which again could affect how the processes within a doctoral framework are structured and operationalised.

Table 6.5: Comparison of source of finance and students' ways of working (by *t*-test)

Ways of working	**Self and Research Council**	**Self and Institutional Bursary**	**Self and Employer**	**Research Council and Institutional Bursary**	**Research Council and Employer**	**Institutional Bursary and Employer**	***Percentage of significant values***
Working independently	0.6%	0.5%	NS	NS	NS	NS	***33%***
Joint working with researchers	0.1%	NS	NS	4%	2%	NS	***50%***
Collaborating with colleagues	<0.1%	NS	NS	0.2%	0.6%	NS	***50%***
Percentage of significant values	***100%***	***33%***	***0%***	***67%***	***67%***	***0%***	***Overall Mean - 44%***

Description: Student Perspective

Table 6.5 shows that comparing students' sources of finance with their views of ways of working produced the equal highest overall mean percentage of significantly different results. Evidently this has had a profound affect on how importantly students perceive these three doctoral processes. Thus the source of finance as well as the subject area has produced the greatest variation in opinion.

Table 6.5 shows that self and research council funded students have significantly different views about the importance of these ways of working. Those financed by a research council considered all of them as more important than self funded students and consequently rated them as 'very important'. In contrast self funded students viewed these processes as only 'quite important' and 'important'. Despite these different ratings, both student groups ranked them in the same order, with 'working independently' placed highest and 'joint working with researchers' lowest.

From this Table it is also clear that comparisons between the self and employer funded, and between institutionally and employer funded students, produced no significantly different responses. This was because both comparisons produced similar views. In general all these students had a high regard for all three ways of working and rated them as either 'important' or 'very important'.

No single way of working created either complete disagreement or total agreement about the importance of it during a doctorate. Half of the comparisons showed that joint working and collaboration were perceived in different ways, whereas 'working independently' resulted in more widespread agreement. All the students considered this an important feature of a doctorate and consequently ranked it first in order of importance.

Description: Graduate Perspective

The source of finance had less influence on how graduates responded than it did for students. In general, graduates from all four different funding categories viewed these ways of working as important and all agreed that working independently was

the most valuable process. The only slight exception were those who were self-funded. They regarded collaboration and joint working as less important compared with graduates funded from other sources. This was a pattern also reflected by the students, although the graduates' views were more extreme. Evidently relationships with other colleagues and researchers was viewed in slightly different ways by those candidates who have financed their own doctoral activity.

Commentary

Table 6.5 has shown that the source of finance had a much more profound influence in shaping students' rather than graduates' views. It is of interest to see that research council funded students viewed all these ways of working equally as 'very important'. Evidently they valued both working independently and with others and considered them to be crucial aspects of a doctoral process. In contrast, self funded students viewed all the ways of working as less important, suggesting that they are not so concerned with these components of a doctoral process. This pattern was also reflected in the graduate profile. However, no students or graduates viewed any of these ways of working as 'not important'. This indicates that all candidates, to varying degrees, are conscious of the abilities gained from different levels of interaction.

Table 6.6: Comparison of age on completion and students' ways of working (by *t*-test)

Ways of working	**Under 25 and 25-30**	**Under 25 and 31-40**	**Under 25 and 41-60**	**Under 25 and 61+**	**25-30 and 31-40**	**25-30 and 41-60**	**25-30 and 61+**	**31-40 and 41-60**	**31-40 and 61+**	**41-60 and 61+**	***Percentage of significant values***
Working independently	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	***0%***
Joint working with researchers	NS	NS	<0.1%	NS	NS	2%	NS	NS	NS	NS	***20%***
Collaborating with colleagues	10%	8%	<0.1%	NS	NS	6%	NS	NS	NS	NS	***40%***
Percentage of significant values	***33%***	***33%***	***67%***	***0%***	***0%***	***67%***	***0%***	***0%***	***0%***	***0%***	***Overall Mean - 20%***

Description: Student Perspective

Table 6.6 shows that comparing the students' age on completion with their views of these ways of working produced the lowest number of significantly different results. Clearly the age of the student had the least effect on how important these ways of working were viewed. It also indicates that the responses were very similar. However, comparing the under 25 and 41-60, and the 25-30 and 41-60 categories produced responses of the greatest difference. Students under 25 and in the 25-30 category viewed joint working more importantly that students aged 41-60. Collaborating was also valued higher by both of the younger groups of students who rated it 'very important' compared with 'important' for the 41-60 group.

Quite noticeable from Table 6.6 is that over half of the age group comparisons did not produce any significantly different results. This highlights the similarity of students' views. All students regarded each way of working as either 'important' or 'very important', irrespective of their age.

Out of the three ways of working only 'working independently' did not create any significantly different results because all students perceived it as 'very important'. Clearly independence is viewed as a core characteristic of doctoral activity by students of all ages. Consequently it was ranked first in order of importance by all students. There was also consistency in the ranking of the other ways of working as all students placed collaboration second and joint working last in order of importance.

Description: Graduate Perspective

The age on completion was the only factor to create more disagreement among the views of graduates than it did for students. Evidently depending on their age, the graduates had different perspectives on how important these ways of working were. The most noticeable contrast was between the views of the youngest graduates compared with those aged between 41-60. Those under 25 regarded all three ways of working as significantly more important than any of the older graduates, and rated them as 'extremely important'. Another interesting feature was the exceptional value

placed by the young graduates on collaboration and joint working. These interactive processes were considered more important than working independently. This trend altered with the increased age of the graduate. Older graduates showed a higher regard for independence and attributed significantly less value to either collaborative or joint working. This pattern reflects the profile of student' responses, although the graduates' views were more pronounced. In contrast to the students' consistent responses, graduates demonstrated much greater variation on their ratings of these processes.

Commentary

Table 6.6 shows that the students' perceptions of these ways of working was not greatly affected by their age. All three ways of working were viewed as integral components of the doctoral process. Potentially this has implications for the design and structure of doctorates, professional doctorates in particular. These are primarily orientated towards senior professionals, who inevitably tend to be of an older age group. Naturally this population feels that collaboration in some form, is an important part of the doctoral process in addition to working independently. This was also true for the PhD students. However, there is a tension between these views and those of the graduates. With hindsight and post-doctoral experience, perceptions are different depending on the age of the graduate. Certainly the youngest graduates have a high opinion of interaction but this contrasts quite significantly with other candidates. Why this is the case and how it should be tackled at a curriculum design level, is not immediately apparent.

Discussion

This chapter has explored students' perceptions of the importance of three different ways of working during a doctorate, working independently, joint working with other researchers and collaborating with colleagues. The core of this discussion deals with the representation of the student responses, but the views of graduates are also shown in relation to these. As in Chapter 5, the following figures aim at giving a visual idea of how importantly these processes were viewed. The previous six tables have shown the statistical analysis of the significantly different results and the absolute values are again displayed within the appendices. During this chapter, both the subject area of the doctorate and the students' source of finance have had the most effect on how students have responded. Evidently the importance of the three ways of working have been significantly shaped by these two factors. The following six figures show the varieties of opinions about these ways of working and their relation to the subject area and source of finance.

The ways of working that created the greatest candidate disparity

Figure 6.1. Candidates' responses and 'collaborating with other colleagues'

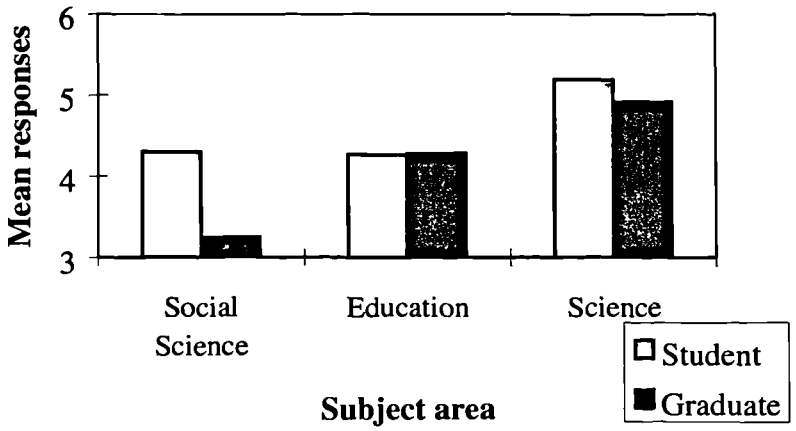
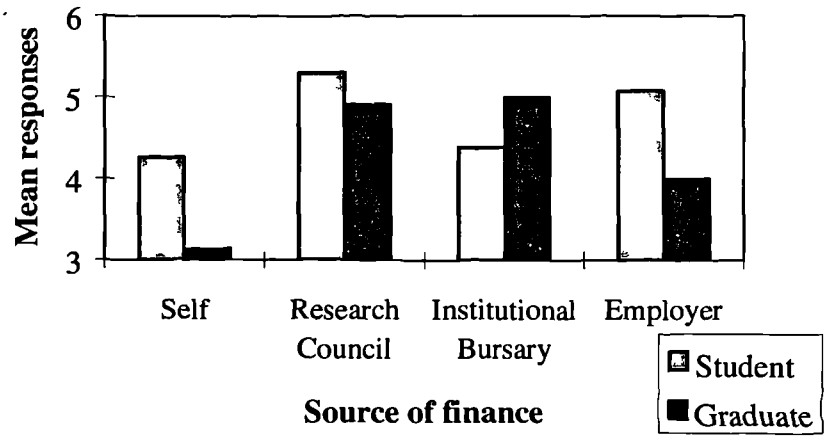


Figure 6.2. Candidates' responses and 'collaborating with other colleagues'



The above two graphs show that collaboration was generally regarded by all students as an important part of a doctorate. However, significant differences are also apparent in how they have valued it. Science students perceive collaboration as a fundamental component of the doctoral process, more so than those from either social science or education. Similarly those funded by research councils favour interaction more than those supported by other means.

Figure 6.3. Candidates' responses and 'joint working with other researchers'

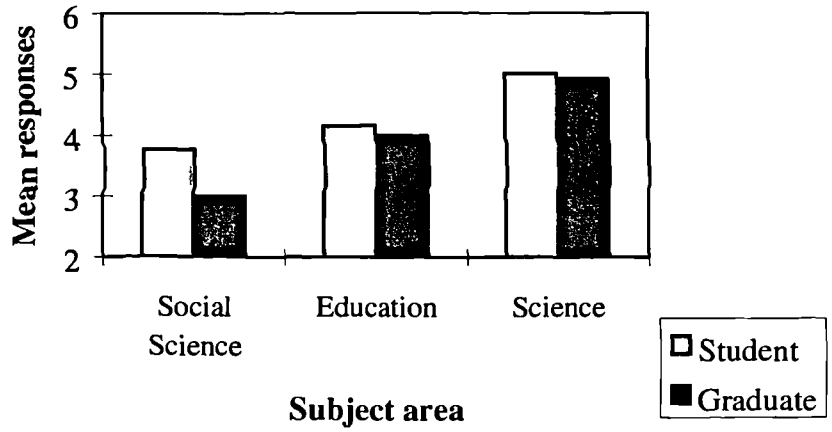
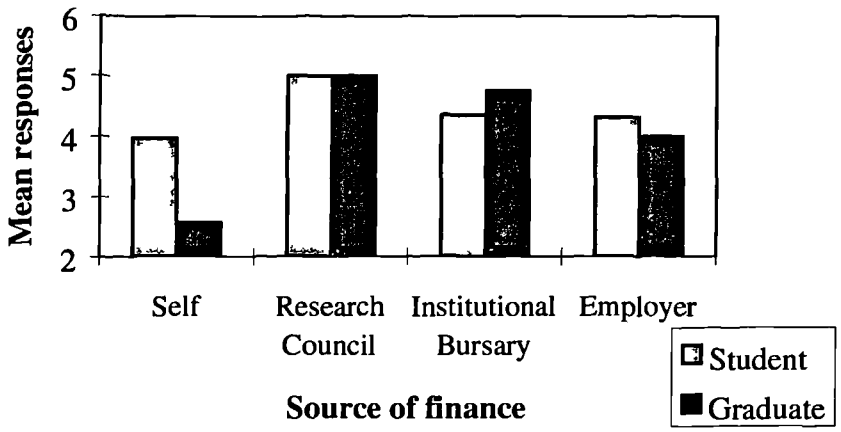


Figure 6.4. Candidates' responses and 'joint working with other researchers'



Close association with other researchers also followed a similar pattern to collaboration. Science students and those funded by a research council are significantly more supportive of this way of working than those from other subject areas and funded from other sources. Different forms of engaging with others was perceived as extremely valuable by these students. However, this may be a reflection of the slightly distorted sample. Both institutions that provided the science samples are regarded as prestigious and attract considerable sums of external funding. The scope for large groups of researchers and research students is therefore much greater, resulting in more opportunities for collaboration. This does not necessarily indicate that all science candidates view and experience this way of working constructively. In a less reputed institution, large communities of researchers may not exist, and therefore the value attached to collaboration may differ.

The value placed on joint and collaborative working by those in science, may also reflect the nature of research undertaken within this discipline. While this pattern is not uniform, research in the natural sciences tends to be much more project *orientated than in the social sciences.* As a result doctoral students are more likely to make their individual contribution within a large-scale project context. Working with other colleagues of varying seniority and experience is therefore more common as students themselves are likely to form an integral part of how the project team

functions. This is not normally the case in the social sciences where research appears to operate on a more individual level.

Another explanation for the varying perceptions of these ways of working may lie in the resources required by students to effectively undertake a doctorate in their discipline. A doctorate in the natural sciences is much more likely to require costly resources, both in terms of laboratory space and subject specialist equipment. This requires students to undertake much of their doctorate at the institution where this equipment is held. The importance of the resources means that processes of negotiation, sharing and collaborating must form an integral part of the doctoral experience in this subject area. By and large this is a different situation compared with the processes involved in a social science doctorate. Although experiences can clearly vary, and 'social science' encompasses a range of subjects, there is generally not the same requirement for this level of specialist resources needed to complete a doctorate. Consequently it is unlikely that the same ways of working are experienced. Certainly the types of collaboration and joint working would be different and may well be less extensively engaged in.

Students' opinions of these ways of working are clearly informed by their own doctoral experiences, whatever they may be. However, whether or not the value is attributed to these processes because of experiences at a technical and/or critical level, is unknown. Experiences within the social sciences would be less likely to be technically based because of the comparatively minimal resource requirements. Candidates' value would therefore be based on constructive, critical interaction. But in order to achieve this, more emphasis would have to be placed on structuring collaborative activities into a doctoral experience, given that it is less likely to occur naturally. This has implications for the design and structure of doctoral curricula and how formal collaboration is viewed.

The way of working that created the greatest student consensus

Figure 6.5. Candidates' responses and 'working independently'

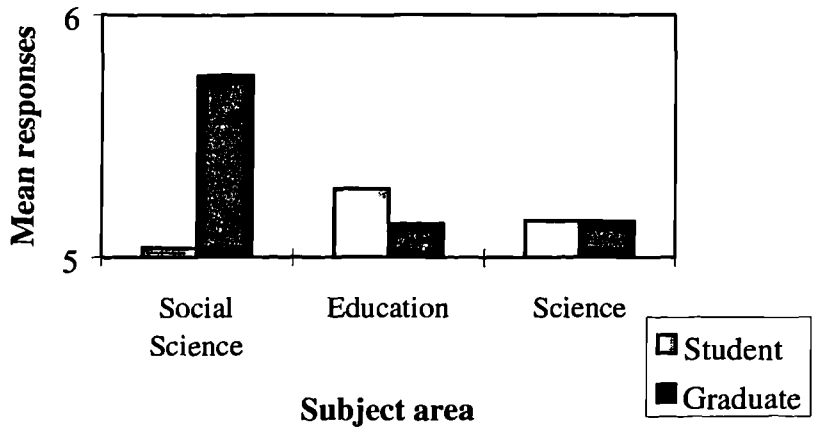
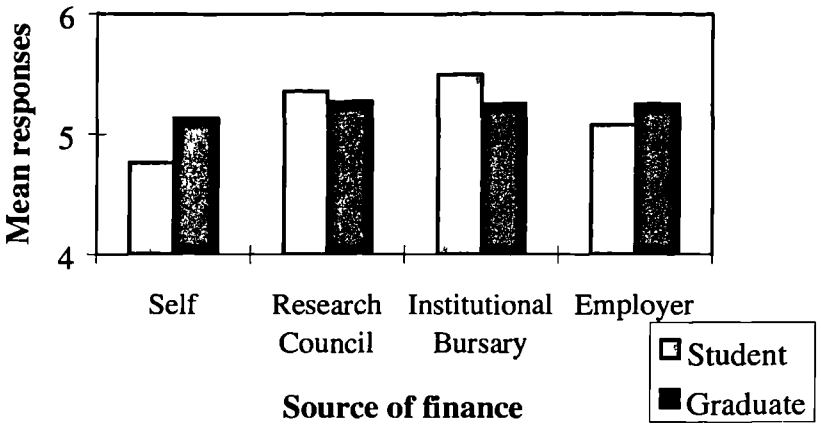


Figure 6.6. Candidates' responses and 'working independently'



Figures 6.5 and 6.6 demonstrate that working independently is perceived as a core doctoral characteristic by all candidates. This was the way of working that created the greatest amount of agreement among students and graduates. The figures show relatively little difference between student and graduate opinions but some interesting features have emerged. For example, social science graduates evidently regard working independently as more important than students from this discipline, and indeed as more important than the other graduates. Post-doctoral experiences may increase the value attributed to these processes. If this way of working plays an

important role within the graduates' professional environment, the process of developing this skill during a doctorate may be appreciated. Also apparent is the greater agreement among graduates than students. This pattern is particularly evident when the different funding sources are examined. Clearly the source of financial support affected the students' responses much more than the graduates. This is conceivable given that students may be much more aware of their funding provision when among other peers, but less likely to be affected by it when the doctorate has been completed. Graduates evidently viewed independence as a consistently critical component to be developed within any financially supported doctorate.

Conclusion

- all three ways of working were viewed as important
- graduates showed more agreement than students

In general, all three ways of working were regarded as important components of a doctorate, despite opinion being divided by subject area and source of finance. In relation to the subject area, candidates from the social sciences and education showed the greater proximity of opinions. Likewise, candidates funded by a research council or institutional bursary displayed common views that were different to the employer and self funded candidates. Graduates displayed more agreement about how important these ways of working were during the doctoral process.

The considerable value attributed to all three ways of working has important implications for curriculum design. Certainly from the candidates' perspective, these experiences are expected during the research process. This raises important questions for doctoral designers and organisers about whether different forms of interaction with different populations, enhance the doctoral experience and contribute to a more capable graduate. For example, are natural science graduates better communicators because they have been immersed within a discursive and critical community ? Or are abilities particular to graduates from other disciplines regarded as equally valuable ? Obviously the value attributed to different skills depends on the viewpoint that is being considered, but is still an area that requires exploration. This also raises issues for assessors. If candidates should be encouraged to explore and engage in different ways of working, should this be valued in assessment terms and somehow be incorporated into the evaluation processes ?

The establishment of Graduate Schools offer a means of formalising interactive relationships and raising the profile of doctoral candidates. This concept could be used for a range of different purposes, both as a method of structuring research related teaching, and as a forum for promoting student interaction (a variety of different structures were apparent in Chapter 3). If this was designed using a pan-institutional model, doctoral students from a variety of subject areas would have the

opportunity to interact. As well as providing an environment in which different experiences can be shared, the presentation of ideas to a community of researchers who have a range of understanding about one particular topic, could add a new dimension to the communication abilities of graduates. This process would be enhanced by also having the opportunity to interact with researchers who do share an in-depth knowledge about a field, certainly something that was apparent at the NIMR. This would provide a platform for achieving breadth as well as depth of understanding. To some extent a Graduate School could also allow the level of participation to be student led, depending on the organisation of the School and on the individual's wishes. Results presented earlier showed that this may be desirable given the variation in how interactive students want to be.

Candidates' ways of working clearly have implications for the supervisory team. They provide a pivotal point of access and information during the research process. They also play a key part in designing the research strategy and crucially affect the candidates' experience. For some candidates, this relationship will be the only interaction experienced. Perhaps supervisors should also take responsibility for assessing the level of interaction required by the candidate. Depending on how constructive and relevant this was deemed to be, supervisors could aid candidates in accessing or creating group learning.

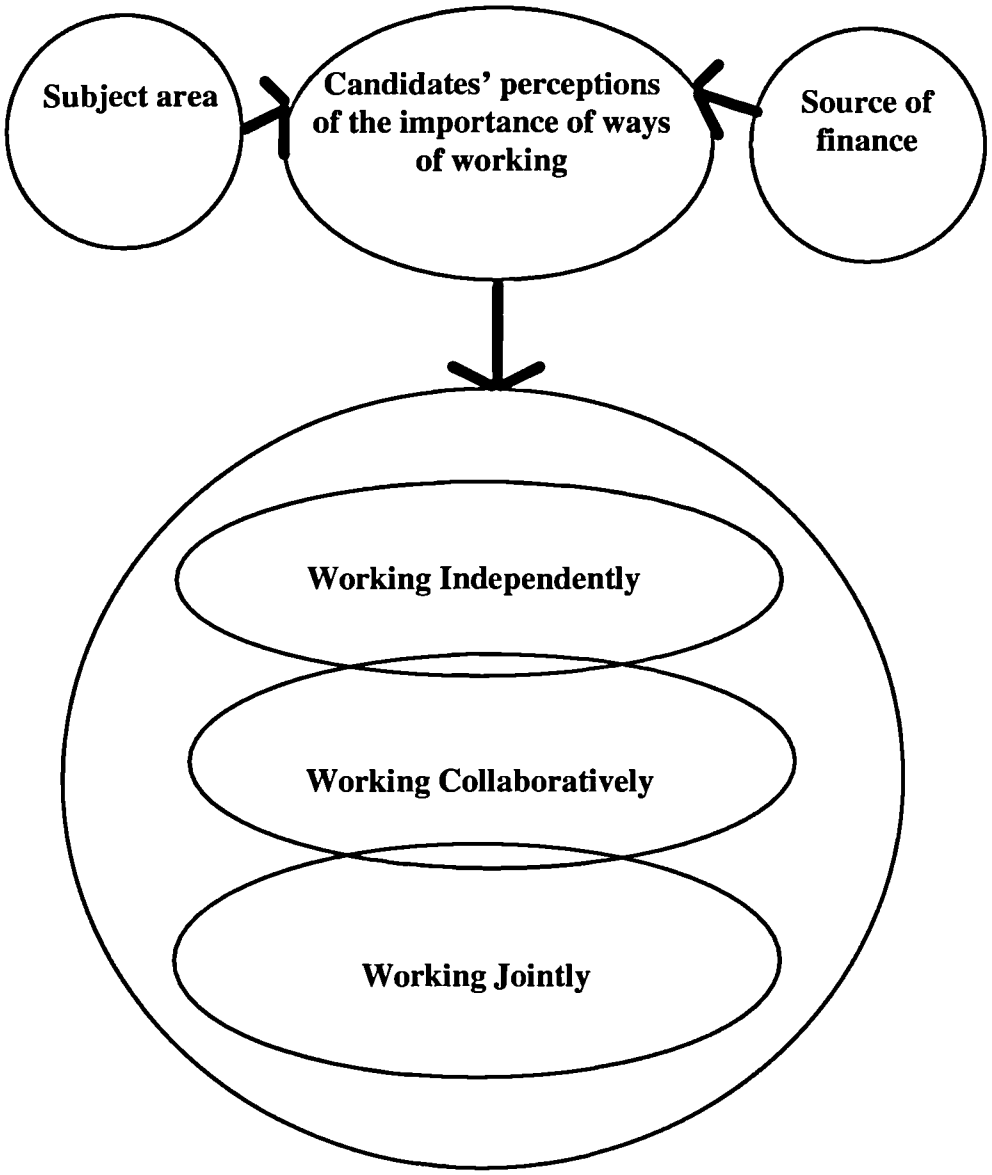
Working independently was uniformly perceived as a critical component of a doctorate, regardless of the subject area or source of finance. How this process is developed within a programme, and whether or not exercises and experiences can be identified that enhance this skill, are questions that need to be explored by curriculum developers. The relationship that this way of working has with more interactive processes in the curriculum, is a complex one. Being independent from the outset of a doctorate may be more likely to foster self-reliance in the long-term. But if joint working or collaboration replaces this, taking full responsibility for research at a later date may be harder. Clearly the balance between different ways of working is delicate and depends on how the skills associated with the process are valued.

Perhaps these three ways of working should not be regarded in isolation. Becoming competent at one may involve the engagement with another. If the development of capable researchers is a goal for doctoral programmes, candidates should be able to work in a variety of different ways within various contexts. Professional research is not an isolated pursuit and a doctoral programme of any type should reflect the way it is conducted. Maybe what is required from an ideal doctoral curriculum is the capacity for different forms of interaction to be engaged with at different stages in the learning process. At the beginning of the doctorate, a functional or technical relationship may be a priority, where the student is exposed to a range of research techniques. While still starting as an autonomous researcher, this peer support could potentially offer an initial breadth of understanding to complement the specialised, in-depth knowledge acquired later in the process. Working and learning within a group of practising researchers could also increase the confidence of a new researcher. Later on in the doctorate, relationships of a more critical nature may be desirable in order to test out and challenge concepts and results. This would clearly need to be a flexible process to allow for contextual differences, but if a model of this kind was considered appropriate, a Graduate School may offer a valuable way of organising it.

Rich Picture 6 shows that each way of working was generally viewed in the same way, despite slight variations according to candidates' subject areas and sources of finance.

Rich Picture 6: Understanding Candidates' Ways of Working

The candidates regarded all three ways of working as important features of a doctoral process. Rich Picture 6 shows the least variation in candidates' perceptions.



Chapter 7 Candidates' Concepts and Capabilities

Introduction

This chapter is divided into two parts. The aim is to explore candidates' understanding of two conceptual areas of a doctorate. The first part of the chapter examines nine definitions of how a doctorate could be conceived.

Table 7.1: Comparison of type of doctorate and students' conception of a doctorate (by *t*-test)

Definition-conception of a doctorate	**PhD and EdD**	**PhD and DProf**	**EdD and DProf**	***Total percentage of significant values***
Significant contribution to knowledge	NS	2%	4%	***67%***
Academic apprentice	2%	0.4%	NS	***67%***
Training in research techniques	2%	0.1%	4%	***100%***
Initiation of a career	<0.1%	<0.1%	NS	***67%***
Culmination of lifetimes work	NS	0.3%	5%	***67%***
Working at a distinctive level	9%	7%	NS	***67%***
Ability to teach	NS	NS	NS	***0%***
Work autonomously	NS	8%	NS	***33%***
Work collaboratively	10%	NS	NS	***33%***
Percentage of significant values	***56%***	***78%***	***33%***	***Overall Mean - 56%***

Description: Student Perspective

Table 7.1 shows that doctoral type had a substantial influence on shaping student conceptions of a doctorate. The table shows that the PhD and DProf students had the greatest difference in responses. They rated nearly all the definitions to be of significantly different importance, apart from the 'ability to teach' and the 'ability to

work collaboratively'. By looking at the ranked mean responses, it is clear that both groups of students viewed these definitions as being 'not important' in their conceptions of a doctorate. It is apparent that PhD students and students from this professional doctorate had very different notions of what the broad purpose of a doctorate should be and consequently ranked the definitions in very different ways. The only exceptions were the 'ability to teach' and the 'ability to work collaboratively' which were agreed as being 'not important' in their concepts of a doctorate.

Comparing the PhD with EdD students produced responses which were also significantly different but there was a greater similarity than with the PhD and DProf comparison. Fewer responses were significantly different which shows that the PhD and EdD students had conceptions of a doctorate which were more similar. Even though this is another comparison of a professional doctorate with the PhD, there is obviously less difference in student thinking than with the previous category.

Finally the EdD and DProf comparison produced responses which are the most similar. Clearly students from these professional doctorates had very similar conceptions of what the broad purpose of a doctorate should be. Despite the different nature of these two programmes and different subject focus, student thinking is obviously closely aligned. Only 'making a significant contribution to knowledge', 'a training in research techniques' and 'the culmination of a lifetimes work' were perceived to be of significantly different importance to these students. The ranked mean responses show that EdD students considered 'making a significant contribution to knowledge' to be 'important' whereas DProf students viewed it as 'very important' to their concepts of a doctorate. 'A training in research techniques' was viewed as 'important' and ranked third by EdD students and 'quite important' and sixth by DProf students. 'The culmination of a lifetimes work' was perceived to be 'quite important' by EdD students and ranked seventh in importance whereas DProf students considered it to be 'important' and consequently ranked it fourth.

One definition, 'a training in research techniques', produced entirely different results in each doctoral type comparison. This definition was viewed to be of significantly different importance by each set of students when considering their conceptions of a doctorate. The PhD students, however, viewed it as more important than the two professional doctoral student categories and viewed it as 'important' and ranked it first. This factor is clearly the PhD students' primary concept of what the purpose of a doctorate should be.

In contrast, 'the ability to teach' created no significantly different responses. This shows that all students, irrespective of the type of doctorate, considered this definition to be of equal importance in their conception of a doctorate. This is supported by examining the ranked mean responses which show that all students were in agreement about the importance of teaching abilities. All students considered this definition to be 'not important' and all ranked it either seventh or eighth in order of importance. Clearly this is agreed as not being a factor which is perceived to be of primary importance in students concepts of a doctorate.

The remaining definitions generally produced significantly different results suggesting that generally there was not a great deal of consensus about their importance to doctoral definitions.

Description: Graduate Perspective

As there were no DProf graduates, comparisons including this group were not possible. However, comparing graduates' responses from PhD and EdD programmes, produced no significantly different results. Graduates' opinions from these doctorates were very similar, and showed much more agreement than those of the students. Both groups of graduates regarded the ability to work autonomously as their most important doctoral concept, a notion that students had prioritised differently.

Commentary

Comparing type of doctorate with definitions of a doctorate has shown the student conceptions and indicated how similar and different they are. Clearly there is significant contrast in the views of PhD and DProf students and great similarity in the two professional doctoral groups. Graduates on the other hand, displayed much more similarity than the students.

The students' results has potential implications for how different types of doctoral programmes are structured. For example Table 7.1 shows that 'the ability to teach' is not an important defining factor of a doctorate for all students in this sample. This suggests that either for professional doctorates or PhDs, students do not view teaching abilities to be central to a doctorate. This may have implications for how doctorates are designed to meet the needs of students. However, there may also be a tension between this unanimous student view and the expectations of other interested parties. Teaching abilities may be perceived to be important to the concept of a doctorate from the perspective of other stakeholders. This also has implications and could cause tensions for the roles and responsibilities students hold on completion of their doctorates.

Table 7.2: Comparison of institution and students' conception of a doctorate (by *t*-test)

Definition-conception of a doctorate	**Middlesex and Imperial**	**Middlesex and Bristol**	**Middlesex and NIMR**	**Imperial and Bristol**	**Imperial and NIMR**	**Bristol and NIMR**	***Percentage of significant values***
Significant contribution to knowledge	5%	NS	<0.1%	NS	NS	10%	***50%***
Academic apprentice	0.1%	NS	<0.1%	0.6%	NS	0.1%	***66%***
Training in research techniques	<0.1%	NS	<0.1%	1%	NS	0.2%	***66%***
Initiation of a career	0.1%	2%	<0.1%	<0.1%	NS	<0.1%	***83%***
Culmination of lifetimes work	NS	NS	<0.1%	NS	NS	2%	***33%***
Working at a distinctive level	NS	NS	1%	NS	NS	0.1%	***33%***
Ability to teach	NS	10%	5%	3%	2%	NS	***66%***
Work autonomously	10%	NS	NS	NS	NS	NS	***17%***
Work collaboratively	4%	NS	0.1%	8%	NS	2%	***66%***
Percentage of significant values	***67%***	***22%***	***89%***	***56%***	***11%***	***78%***	***Overall Mean - 54%***

Description: Student Perspective

Table 7.2 shows that comparing institution with definitions of a doctorate has produced almost the same proportion of significantly different results as Table 7.1. The institutional affiliation of the student therefore had a substantial impact on the responses of the students. It is clear that comparing the student definitions from Middlesex University with those from the NIMR produced results which were the most different. These two sets of students clearly had very different conceptions of what the purpose of a doctorate should be. The most important definition for Middlesex students was 'making a significant contribution to knowledge' which they viewed as 'important' to the concept of a doctorate. In contrast, the NIMR students perceived 'a training in research techniques' as 'very important' and considered this to be their primary definition of a doctorate. Only 'the ability to work autonomously' did not produce a result of significant difference. This shows that students from these two institutions considered this definition to be of similar importance. The ranked mean responses show that it was viewed as being 'important' to both student groups and was ranked third in importance by Middlesex students and fourth by NIMR students.

Bristol and NIMR students also displayed significantly different definitions of a doctorate. Although these groups of students have slightly more similar views to the Middlesex and NIMR comparison, significant difference is still shown. Students from Middlesex and those from Imperial also showed significant difference in their responses. Greater similarity was found by comparing these two institutions but many of the definitions are still viewed to be of significantly different importance.

These highly different views of a definition of a doctorate seen in the Middlesex and Imperial and NIMR comparisons suggests that Imperial and the NIMR might have extremely similar results. This is confirmed by looking at this comparison which produced the lowest result. Both groups of students viewed 'a training in research techniques' to be their most important definition and the 'culmination of a lifetimes work' as their least. Only the 'ability to teach' produced a result which shows that these two sets of students perceived it to be of different importance. The ranked

mean responses reveal that it was viewed as 'not important' by NIMR students and 'quite important' by Imperial students. Clearly teaching abilities are not primary definitions for students from these institutions. Middlesex and Bristol also showed similarity in their definitions of a doctorate. Only the 'initiation of a career' and the 'ability to teach' caused disagreement in this student comparison. The ranked mean results show that 'the initiation of a career' was viewed as being 'quite important' by Middlesex students and 'not important' by Bristol students. However, both groups ranked it last in importance. Similarly teaching abilities were regarded as being 'quite important' by Middlesex students but 'not important' by Bristol students and again they both ranked this definition as being eighth in importance. Neither of these factors are perceived to be central to these students' concept of a doctorate.

The institutional comparisons produced a diverse range of results for each of the doctoral definitions. There was no single definition which produced significantly different results in each comparison and likewise no definition that produced very similar results in each comparison. The 'initiation of a career' produced results of the greatest difference. Almost every institutional comparison disagreed as to the importance of this definition. Some students perceived it to be of great importance in their definitions of a doctorate and others disagreed. Only the Imperial and NIMR comparison produced a similar result. The ranked mean responses show that they both viewed it as being 'important'.

In contrast the 'ability to work autonomously' produced almost total uniformity in all institutional comparisons. The ranked mean responses show that nearly all students viewed this definition as being 'important' to their broad conception of a doctorate. This means that this is a common characteristic in how students define the purpose of a doctorate. Only Middlesex and Imperial students slightly disagreed on the importance of this definition with Imperial students viewing working autonomously as slightly more important than students from Middlesex.

Description: Graduate Perspective

The type of institution again had a smaller influence on graduates' responses than it did for students. Those graduates from Middlesex and the NIMR displayed the greatest differences in opinion, the same pattern that was displayed by students from these institutions. Students and graduates from Middlesex both perceived making a significant contribution to knowledge as the most important concept. This was not considered so valuable by candidates from the NIMR, who all regarded the ability to collaborate and a training in research techniques as their ideals. Similarity between the students and graduates from Imperial and the NIMR were also shown. While both perceived collaborative ability and a research training as the most important doctoral concepts, they also regarded the ability to teach and the culmination of a lifetimes' work as inappropriate doctoral notions.

Commentary

Comparing institution with definition of a doctorate has shown that the opinions of both students and graduates from Middlesex and the NIMR are the most different. These two groups of candidates have significantly different concepts of what a definition of a doctorate should consist of. This suggests that the nature of doctorates at these two institutions is very different. It is known that this is implicitly a comparison of students doing both PhDs and DProfs and Table 7.1 indicated that student views from these programme types are significantly different. But this institutional comparison suggests that even the nature of the PhDs would be different. This substantial difference in opinions expressed by these two institutions implies that these students want and expect very different things from their doctoral experience. This has implications for the structure and design of the programmes. This difference in opinion is clearly not the case with the Imperial and NIMR students who have extremely closely associated views. This would suggest that the doctoral programmes at these two institutions are also similarly structured to include the definitions that these students felt were important.

The agreed importance of the 'ability to work autonomously' indicates that this is viewed as a common characteristic of a doctorate by students from virtually all

institutions. A big variation exists in the perceived importance of the definitions of a doctorate and no other common characteristics emerge from this institutional comparison. The 'initiation of a career' is clearly a fundamental definition for some students but not for others. This too has implications for the structure of a doctoral programme. If some students consider this definition as being fundamental to their conception of a doctorate, they may expect significantly different components to a programme, in comparison to a student who considers the 'culmination of a lifetimes work' as being a critical definition.

Table 7.3: Comparison of subject area and students' conception of a doctorate (by *t*-test)

Definition-conception of a doctorate	Social Science and Education	Social Science and Science	Education and Science	Percentage of significant values
Significant contribution to knowledge	2%	<0.1%	NS	*67%*
Academic apprentice	NS	0.6%	<0.1%	*67%*
Training in research techniques	NS	0.1%	<0.1%	*67%*
Initiation of a career	1%	0.3%	<0.1%	*100%*
Culmination of lifetimes work	NS	NS	0.2%	*33%*
Working at a distinctive level	NS	5%	5%	*67%*
Ability to teach	NS	NS	NS	*0%*
Work autonomously	NS	NS	NS	*0%*
Work collaboratively	NS	2%	0.1%	*67%*
Percentage of significant values	***22%***	***67%***	***67%***	***Overall Mean - 52%***

Description: Student Perspective

Table 7.3 shows that comparing subject area and students' definitions of a doctorate produced slightly fewer significantly different results than Tables 7.1 or 7.2. Nevertheless it is apparent that the subject area had an influence on students responses. Social science and science students and education and science students were most different in their responses. Social science and education students' opinions differ greatly from science students. These students have significantly different definitions of what the purposes of a doctorate should be. Interestingly there are two definitions which are viewed as being of similar importance by all three. These are 'the ability to teach' and 'the ability to work autonomously'. The ranked mean responses show that there is very little difference in the importance of teaching abilities and all students ranked it eighth in importance. Working autonomously was perceived to be 'important' by all students and all ranked it third in importance. This is clearly a more central concept to a doctorate than teaching abilities.

The opinions of social science and education students are obviously much more similar and they have similar concepts of a doctorate. Only 'making a significant contribution to knowledge' and 'the initiation of a career' are viewed differently. Social science students judged a significant contribution to be 'very important' to their concept of a doctorate and consequently ranked it first. Education students perceived it as 'important' and ranked it second. Although there is a difference in these students' views, this definition is clearly crucial to their concepts of a doctorate. 'The initiation of a career' is generally regarded as less important by both student groups even though their views are slightly different. Social science students perceived it as 'quite important' whereas education students considered it to be 'not important'.

The definitions of a doctorate received a range of responses. The 'initiation of a career' was the only definition to produce a significantly difference responses in each comparison. This means that all students viewed this as being of different importance in their definition of a doctorate. The science students felt that this was 'important' to their conception of a doctorate whereas social science and education students did not.

In contrast, two definitions created responses that were so similar, no significant differences were found. 'The ability to teach' and 'the ability to work autonomously' are clearly common characteristics to consider for doctoral definitions as all students viewed them to be of similar importance. This is shown above in the discussion of the ranked mean responses.

Description: Graduate Perspective

The subject area had a significantly smaller affect on graduates' views than it did for students. Graduates from all subject areas displayed considerable agreement over the importance of these concepts. Graduates' perceptions from social science and education showed the greatest similarity, which differed slightly to the views of those from science. While this is a similar pattern to the student responses, far more agreement was displayed among graduates.

Commentary

The comparison of subject area and conceptions of a doctorate showed that the views of students and graduates from social science and education were closely aligned but significantly different from the science candidates. This has implications for the orientation and structure of doctoral programmes. Clearly these groups of candidates from different subject areas regard the doctoral definitions to be of significantly different importance. This may affect their expectations of what should be built into the programme and consequently what their motivations are for undertaking doctoral study.

'The initiation of a career' is clearly a definition which created significantly different responses among students. The ranked mean responses showed that this factor was significantly more important for science students than for either social science or education students.

Table 7.4: Comparison of mode of study and students' conception of a doctorate (by *t*-test)

Definition-conception of a doctorate	**Full-time and part-time**	**Full-time and distance learning full-time**	**Full-time and distance learning part-time**	**Part-time and distance learning full-time**	**Part-time and distance learning part-time**	**Distance learning full-time and distance learning part-time**	***Percentage of significant values***
Significant contribution to knowledge	0.7%	NS	NS	NS	NS	NS	***17%***
Academic apprentice	<0.1%	9%	9%	NS	NS	7%	***67%***
Training in research techniques	<0.1%	NS	2%	NS	NS	NS	***33%***
Initiation of a career	<0.1%	<0.1%	2%	<0.1%	NS	8%	***83%***
Culmination of lifetimes work	1%	NS	4%	NS	NS	NS	***33%***
Working at a distinctive level	0.9%	<0.1%	NS	3%	NS	NS	***50%***
Ability to teach	NS	<0.1%	NS	<0.1%	NS	0.6%	***50%***
Work autonomously	NS	NS	NS	NS	NS	NS	***0%***
Work collaboratively	<0.1%	NS	NS	NS	NS	NS	***17%***
Percentage of significant values	***78%***	***44%***	***44%***	***33%***	***0%***	***33%***	***Overall Mean - 39%***

Description: Student Perspective

Table 7.4 suggests that mode of study did not have a substantial effect in shaping student responses. It also shows that there is a higher degree of overall similarity in the students' views than expressed in Tables 7.1, 7.2 or 7.3. Having said that, comparing full-time with part-time responses has produced the highest number of significantly different results. This indicates that the definitions of a doctorate as perceived by these two student groups, are different. Full-time students viewed 'a training in research techniques' as their most important definition, whereas part-time students considered 'making a significant contribution to knowledge' as their most important concept. Only 'the ability to teach' and 'the ability to work autonomously' were viewed the same. Both sets of students considered teaching abilities to be 'not important' to their concept of a doctorate and both ranked it eighth. Working autonomously on the other hand was collectively viewed as 'important' and jointly ranked third in importance.

None of the other comparisons of modes of study express results which are close to the full and part-time comparison. Part-time and distance learning part-time produced no results of significance which shows that these two student groups had virtually identical responses. Clearly these students' definitions of a doctorate are very alike and the ranked mean responses show that both sets of students viewed 'making a significant contribution to knowledge' as their most important doctoral concept. In many ways this similarity is not a surprising result given that the experience of being a part-time student is very akin to that of a part-time distance learner.

The nine definitions of what a doctorate could consist of receive a range of different results. No single definition created complete disagreement over its importance in every comparison but 'the initiation of a career' came the closest. Most of the students viewed this in different ways with the exception of the part-time and distance learning part-time students. They perceived this definition to be 'not important' and ranked it last in importance for their concept of a doctorate.

The definition to receive the least difference in opinion was 'the ability to work autonomously'. All student comparisons viewed this to be of equal importance in their definition of a doctorate, irrespective of their mode of study. The 'ability to work collaboratively' was also largely viewed in similar ways. The ranked mean responses show that most students perceived it to be 'quite important'. However the full and part-time comparison proved the exception with full-time students regarding it as 'important' and part-timers as only 'quite important'. This suggests that the ways of working within a doctorate are largely viewed to be of similar importance to the doctoral experience, but collaborative activities are more fundamental for full-time students.

Description: Graduate Perspective

No distance learning graduates were identified from the sample, so only full and part-time comparisons were possible. Although there was more similarity in the graduates' responses, mode of study still had the biggest influence in shaping their views. Full-time graduates considered a training in research techniques as the most valuable concept, also the same as full-time students. This was not viewed in the same way for part-time candidates who all rated a significant contribution to knowledge as their ideal. Clearly mode of study has had a significant impact on how candidates value these concepts, as the perceptions held by full-time and part-time candidates are significantly different.

Commentary

Table 7.4 shows that students' mode of study did not significantly affect their conceptions of a doctorate. However, the part-time and full-time students and graduates had definitions of a doctorate which were significantly different and part-time and distance learning part-time students had the most similar views. This suggests that full and part-time students have different notions of what a doctorate should consist of. This may also mean that they have different expectations of a programme. This has possible implications for the structure of programmes depending on whether or not the students are studying part-time or full-time. Clearly

the structural implications for part-time students would also apply to the needs of distance learning part-time students as well, which is an interesting point to consider.

The 'initiation of a career' is clearly a fundamental concept for full-time students and not for any of the others. This also has implications for the structure of doctoral programmes. If full-time students are undertaking a doctorate to initiate their career, they may have very different expectations to those viewing 'the culmination of a lifetimes work' as integral to their concept of a doctorate. The ability to work autonomously and collaboratively are common definitions to students concepts of a doctorate, irrespective of their mode of study. The ways of working within a doctorate are agreed by all students to be of equal importance. This has implications for the structure of doctoral programmes as the students expect these ways of working to be built into the process of a programme.

Table 7.5: Comparison of source of finance and students' conception of a doctorate (by *t*-test)

Definition-conception of a doctorate	Self and Research Council	Self and Institutional Bursary	Self and Employer	Research Council and Institutional Bursary	Research Council and Employer	Institutional Bursary and Employer	Percentage of significant values
Significant contribution to knowledge	0.2%	4%	NS	NS	3%	NS	*50%*
Academic apprentice	<0.1%	3%	NS	NS	0.1%	7%	*67%*
Training in research techniques	<0.1%	0.9%	NS	NS	<0.1%	5%	*67%*
Initiation of a career	<0.1%	NS	NS	<0.1%	<0.1%	2%	*67%*
Culmination of lifetimes work	<0.1%	<0.1%	2%	NS	3%	5%	*83%*
Working at a distinctive level	10%	9%	NS	NS	4%	5%	*67%*
Ability to teach	3%	1%	4%	NS	NS	NS	*50%*
Work autonomously	5%	NS	NS	NS	NS	NS	*17%*
Work collaboratively	0.1%	1%	6%	NS	NS	NS	*50%*
Percentage of significant values	***100%***	***78%***	***33%***	***11%***	***67%***	***56%***	***Overall Mean - 57%***

Description: Student Perspective

Table 7.5 shows that comparing source of finance with students' conception of a doctorate produced the highest overall mean percentage of significantly different responses. The source of finance evidently had the greatest influence on students' definitions of a doctorate. The greatest difference in student views was between the self funded and research council funded students. Every definition in this comparison was significantly different so clearly these two student groups viewed these definitions to be of different importance. The ranked mean responses is evidence of this. The self funded students perceived 'making a significant contribution to knowledge' to be of greatest importance in their definition of a doctorate. In contrast the research council students viewed 'a training in research techniques' as the most important.

Comparing self funded and institutionally funded students also revealed significantly different definitions of doctorates. Only 'the initiation of a career' and 'the ability to work autonomously' were viewed to be of similar importance and both perceived working autonomously as more important than initiating a career.

The research council funded students and the employer funded students also had significant differences in how they defined a doctorate. In contrast however, the research council and institutionally funded students expressed very little difference in their conceptions of a doctorate. Only 'the initiation of a career' was viewed differently. Research council students perceived it as 'important' and ranked it second in importance, whereas institutionally funded students viewed it as only 'quite important' and ranked it seventh. This overall similarity in responses is not surprising in the sense that a lot of research council funding is institutionally associated making the profiles of students very similar.

Doctoral definitions received a range of responses, yet no single definition produced significantly different responses in each comparison and similarly, none of the student comparisons viewed a definition as being of similar importance. However, 'culmination of a lifetimes work' was perceived in significantly different ways by

nearly all the student comparisons. Some students considered this to be important in their definition of a doctorate and others did not, depending on their sources of funding. The ranked mean responses reveal that only self-funded students thought this factor was 'quite important' and the remaining students viewed it as 'not important'. The research council and institutionally funded students viewed this definition in virtually identical ways. Both thought it 'not important' and both ranked it last in importance. Clearly the concepts of a doctorate held by self-funded students are significantly different from the others.

'The ability to work autonomously' had the greatest agreement. Virtually all student comparisons viewed this to be of importance. The only slight difference was the views of self and research council funded students whereby self funded students considered it to be slightly less important than the other students.

Description: Graduate Perspective

As discussed in the previous Tables, graduates' views were much less affected by their source of finance than the students' were. Funding had the biggest impact on students' perceptions, but considerably more agreement among the opinions of graduates was shown. For example, the ability to teach and the culmination of a lifetimes' work were frequently displayed as unimportant doctoral concepts for graduates. This uniformity of opinion was also reflected in the students' views who generally shared these values. Concepts perceived as fundamental were less consistent, but making a significant contribution to knowledge appeared important to some candidates.

Commentary

Comparing source of finance with students' conceptions of a doctorate produced the greatest number of different responses but was not reflected in the graduates' responses. Clearly this was a factor which had a significant impact on how students considered a doctorate, but not for graduates. Research council and institutionally funded students were the most closely aligned in terms of the similarity of their responses, and self and research council funded students were the furthest apart with

significantly different opinions. This suggests that research council and institutionally funded students have similar expectations from a doctorate and possibly similar motivations. However, this is obviously very different from the expectations of self funded students. This has a bearing on the structure of a doctorate and the different provisions within the programme.

'The ability to work autonomously' is a definition which is commonly shared by nearly all the students, irrespective of their source of finance. This suggests that students view this as a generic feature of any doctoral programme. This has implications for the structural design of doctorates as nearly all these students would obviously expect this to be a feature of the programme and also a personal outcome. It is worth considering how doctoral study promotes *effective autonomous working* and what kinds of strategies are used in different types of doctoral programmes.

Table 7.6: Comparison of age on completion and students' conception of a doctorate (by *t*-test)

Definition - conception of a doctorate	Under 25 and 25-30	Under 25 and 31-40	Under 25 and 41-60	Under 25 and 61+	25-30 and 31-40	25-30 and 41-60	25-30 and 61+	31-40 and 41-60	31-40 and 61+	41-60 and 61+	Percentage of significant values
Significant contribution to knowledge	NS	2%	Ns	<0.1%	<0.1%	0.9%	<0.1%	NS	0.1%	<0.1%	*70%*
Academic apprentice	NS	5%	<0.1%	NS	NS	0.1%	NS	NS	NS	NS	*30%*
Training in research techniques	NS	4%	<0.1%	NS	NS	0.4%	NS	3%	NS	NS	*40%*
Initiation of a career	0.6%	<0.1%	<0.1%	NS	0.6%	<0.1%	NS	NS	NS	NS	*50%*
Culmination of lifetimes work	NS	NS	<0.1%	<0.1%	NS	0.6%	<0.1%	0.5%	<0.1%	<0.1%	*70%*
Working at a distinctive level	NS	NS	0.9%	NS	NS	10%	NS	NS	NS	NS	*20%*
Ability to teach	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	*0%*
Work autonomously	NS	NS	NS	NS	NS	NS	NS	NS	10%	NS	*10%*
Work collaboratively	NS	NS	0.1%	NS	NS	<0.1%	NS	NS	NS	NS	*20%*
Percentage of significant values	***11%***	***44%***	***67%***	***22%***	***22%***	***78%***	***22%***	***22%***	***33%***	***22%***	***Overall Mean - 34%***

Description: Student Perspective

Table 7.6 shows that the age of the students had the smallest influence on how they responded. Having said that, clear differences in opinion depending on the students' age is apparent. The greatest difference is between the 25-30 and 41-60 groups. The students evidently have significantly different concepts of a doctorate and perceive these doctoral definitions to be of different importance. Only 'the ability to teach' and 'the ability to work autonomously' were agreed to be of similar importance by both groups of students. They both viewed teaching abilities to be 'not important' in their concept of a doctorate and both ranked it eighth in importance. Working autonomously on the other hand was considered 'important' and ranked third.

Comparing under 25s with the 41-60 students also produced significantly different responses. Again, these students clearly perceive the importance of these definitions in different ways. Interestingly these students also agreed on the importance of teaching and working autonomously. They also both viewed 'making a significant contribution to knowledge' as 'important'; clearly a factor central to their concepts of a doctorate.

The remaining student comparisons produced relatively few significant differences in opinion. This suggests that the opinions of these students are more closely aligned. The under 25s and the 25-30 categories have the most similar conceptions of a doctorate. They both view the doctoral definitions as being of similar importance. Only the importance of 'the initiation of a career' differed and it was more important for the slightly younger category which ranked it second in importance.

A general trend is apparent from Table 7.6 showing that concepts of a doctorate are the most different between extreme age groups. Equally the closer the age of the students, the more similar their definitions of a doctorate are likely to be.

The definitions of a doctorate show a range of responses. 'Making a significant contribution to knowledge' and 'the culmination of a lifetimes work' both received

the most number of significantly different results. This shows that these definitions were perceived to be of significantly different importance depending on the age of the students. In contrast 'the ability to teach' produced total agreement from all student comparisons about how important it is to the definition of a doctorate. The majority of student perceived it to be 'not important' in their concept of a doctorate which suggests that this is a common characteristic of a doctorate.

It is also apparent that the ways of working during a doctorate were perceived in similar ways by most of the students. Working autonomously and collaboratively and 'the ability to work at a distinctive level' all received few significantly different responses. The ranked mean responses show that these definitions were generally viewed as 'important' by most students.

Description: Graduate Perspective

Graduates' age on completion produced similar differences to those of the students. However this was not a profound impact and a great deal of similarity was apparent among graduates' views in particular.

Commentary

Comparing student and graduate age on completion with concepts of a doctorate produced the lowest number of significantly different responses out of all six Tables. This shows that age had the least bearing on how candidates perceived a doctorate. This is interesting to note and suggests that common concepts of a doctorate are held, irrespective of age. This has implications for designers and developers of doctorates and impacts upon marketing and recruitment of programmes. It would appear that although the individual motivation for undertaking a doctorate does vary significantly with the age of the student, the broader conceptions do not. The expectations of what is to be achieved through a doctorate are more commonly held. The Table shows that teaching ability is certainly one factor which is agreed to be not important to students concepts. A possible pattern has emerged which suggests that responses are more similar if the age of the students is closer together, although exceptions exist.

Discussion

This section has explored students' and graduates' perceptions about the importance of nine definitions of a doctorate. The aim was to identify candidates' broad conceptions of a doctorate. The six tables have shown that the 'source of finance' has had the greatest affect on how students have responded. The funding of doctoral study has significantly shaped their views of doctoral concepts. In contrast the 'age on completion' had the least impact on student responses. The following nine figures show how students and graduates responded according to the funding source.

Concepts creating the greatest disparity

Figure 7.1. Candidates' responses and the 'initiation of a career'

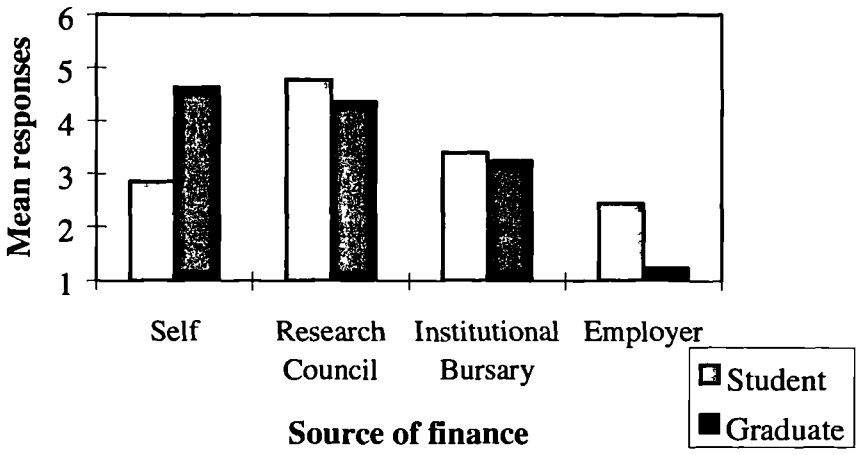
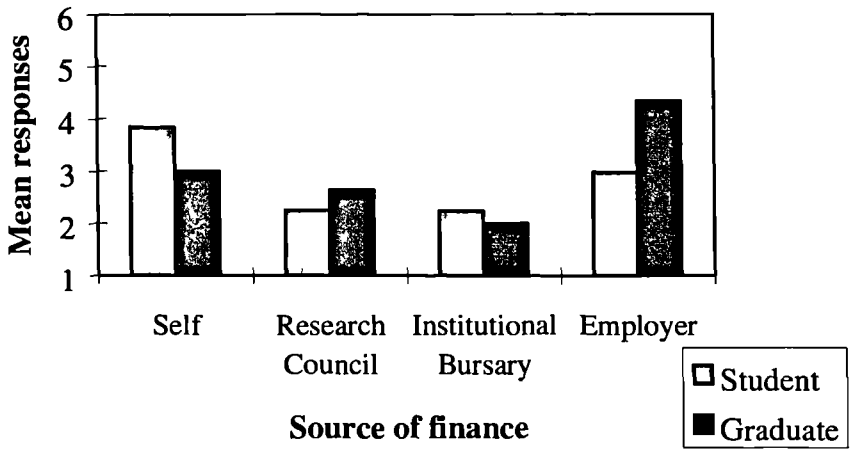


Figure 7.1 shows that the initiation of a career was a doctoral concept that created enormous variation in opinion, depending on candidates' source of funding. This very much reflects the pattern of candidates' motivation shown in Chapter 4. Those who were research council funded were more driven by the possibility of enhancing career prospects than candidates financed by other sources. Self and employer funded candidates were motivated by other factors such as personal development. Figure 7.1 above endorses this and particularly shows that employer funded candidates attributed little value to the initiation of a career as a doctoral concept, and consequently valued other definitions.

Graduates' views have differed to those of the students, although similar variation in responses has been shown. In stark contrast, self-funded graduates viewed career initiation as an important doctoral concept. Whether they were drawing on personal experience, where they had found particular professional value from having a doctorate, or whether the graduates were talking in more abstract terms, is unknown. However, this noticeable difference is in contrast to the negligible value given to this definition by employer funded graduates. Does this suggest that employers want students to do doctorates after they have been in employment, or does this suggest that employers need to be 'educated' to see the benefits of taking on doctoral graduates ? If this is so, there are implications for employer linked research and for skills training on the parts of both candidates and employers.

Figure 7.2. Candidates' responses and 'the culmination of a lifetimes' work'



The variety of responses to 'culmination of a lifetime's work', shows that it is not unanimously regarded as a core ideal for a doctorate. Those who consider it important are more likely to be in the latter phases of their professional lives and view a doctorate as acknowledging this career. It is not therefore surprising that these are people who are self or employer funded. Interest from the research councils in funding individuals who will not necessarily have long-term benefit for the nations' research profile, is likely to be negligible. Perhaps a professional doctorate would be of interest to these candidates who could capitalise on their professional experience and incorporate it into the focus of their research. This value is shown in the above figure by those candidates who were employer funded. The other

possibility is that candidates may wish to undertake research that is largely of personal interest and of an esoteric nature. As a consequence, it is likely that individuals would have to fund themselves, and this is again shown in the Figure 7.2.

Figure 7.3. Candidates' responses and 'the ability to work collaboratively'

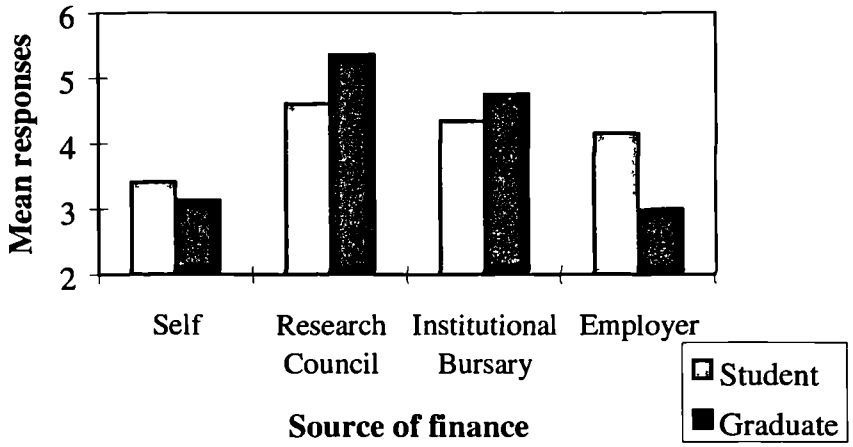


Figure 7.3 shows that the ability to work collaboratively is an important concept for research council and institutionally funded candidates. This may be a direct result of their own doctoral experiences whereby they have identified considerable benefit in being able to work with others. Noticeable from Figure 7.3 is the increased value attributed to this ability by graduates from these funding sources. Perhaps this is because graduates have been able to apply this ability and have valued it within their post-doctoral employment.

In contrast, those candidates who were self funded, did not regard this as a key doctoral ability. Indeed the graduates viewed collaboration as less important than the students. Whether these candidates would consider collaboration an unimportant process during a doctorate, or whether they just don't value the product, is unknown. A big difference in opinion between the employer-funded students and graduates is apparent from Figure 7.3. Evidently the students valued collaborative ability as an important doctoral concept but the graduates did not.

Concepts perceived as important

Figure 7.4. Candidates' responses and 'an academic apprenticeship'

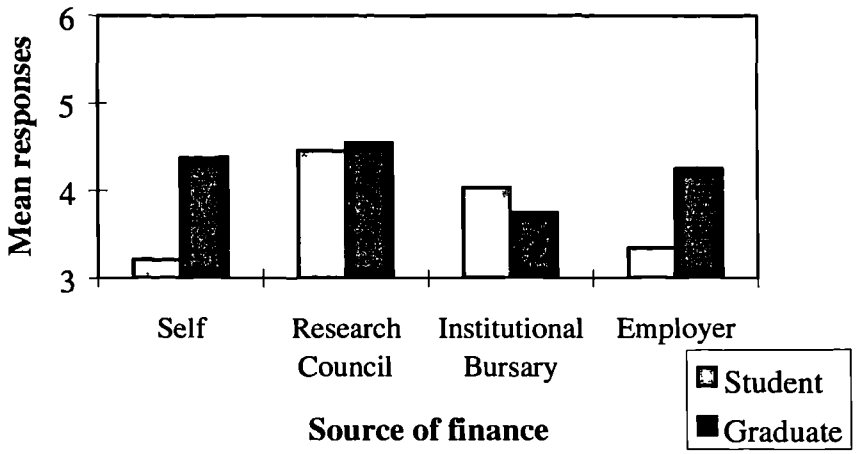


Figure 7.4 shows that an academic apprenticeship was largely viewed by all as an important doctoral concept. Those students and graduates funded by a research council displayed the greatest candidate agreement, suggesting that many of these would aim to obtain an academic post on completion of their doctorate. Both the self and employer funded students considered this concept as slightly less important. However, graduates funded from these sources rated it as a valuable notion. Possibly the experience of a doctorate made them regard it an ideal preparation for an academic post, something not considered when engaged in the process. Despite these differences, all candidates perceived this as an important concept. It is interesting to note that these results are not just in relation to a PhD but are perceptions about doctorates in general. Clearly, some candidates view professional doctorates as a means of gaining an academic apprenticeship, something that has traditionally been the remit of the PhD. If this is the perception of some candidates, how do academics feel about this, and are professional doctorates regarded by higher education institutions as being 'equivalent' to a PhD ? While the EdD is becoming more widespread, professional doctorates as a generic category are still relatively lacking in understanding. Their currency and transferability has yet to be explored, as graduates from these programmes are just beginning to emerge.

Figure 7.5. Candidates' responses and 'the ability to work autonomously'

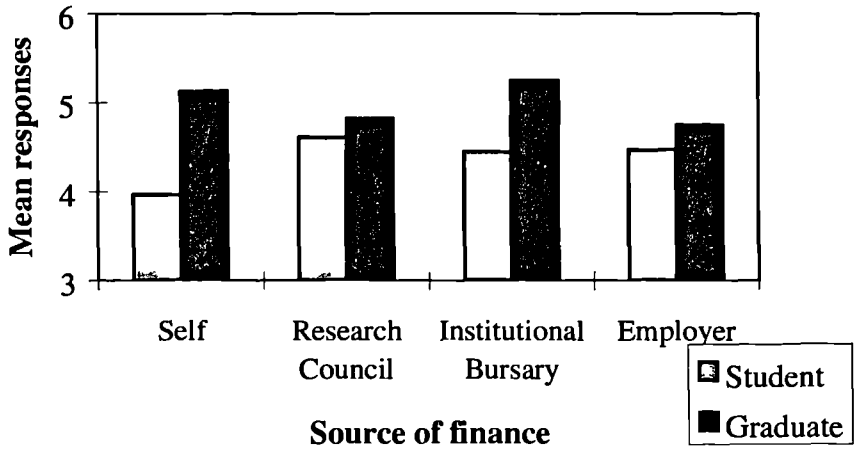


Figure 7.5 clearly shows that the ability to work autonomously was perceived as a fundamental concept by all candidates. Interestingly graduates viewed this ability as more important than the students funded from these sources. While this was not a longitudinal study, these results could indicate that candidates retrospectively appreciate autonomy more than when they were actively engaged in their doctoral study. Whether this is connected with their kind of post-doctoral employment is unknown. But the unanimously high regard for this concept makes it both an individual expectation for candidates, as well as a generic characteristic of doctoral level working. Assuming autonomous working is desirable, what this concept means within different doctoral contexts, and how it can be developed within a curriculum framework, are important questions for doctoral designers to wrestle with.

Figure 7.6. Candidates' responses and 'a training in research techniques'

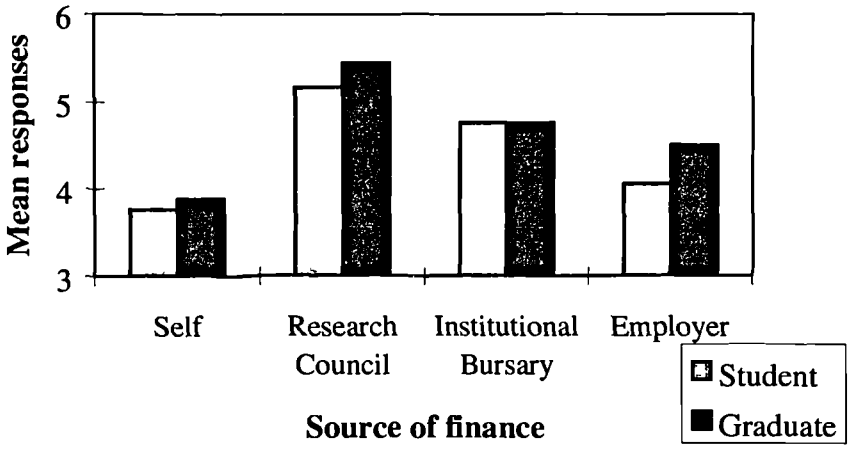
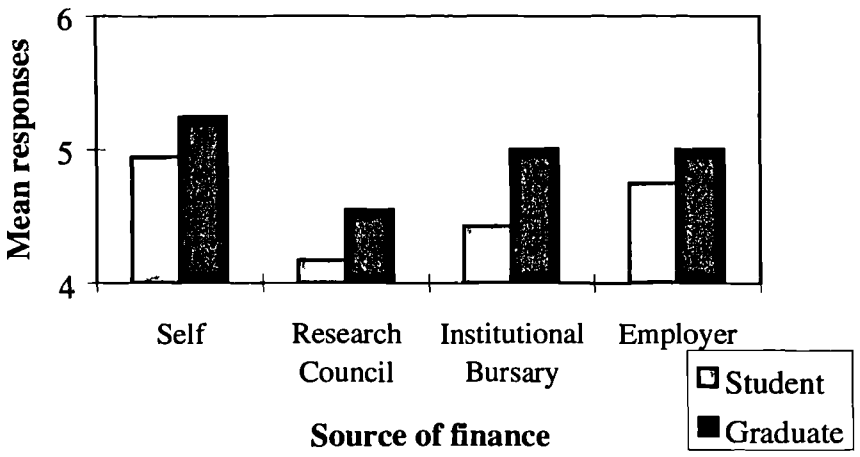


Figure 7.6 shows that a training in research techniques is generally viewed as a core concept for a doctorate. However, candidates funded by a research council evidently attribute more value to this notion than those funded from other sources. In some ways this is not surprising given that a function of research councils is to support and develop research expertise. The requirement of students to attend formal research training either within or external to the institution is common. The training element is therefore fundamental to the doctoral experience for research council funded candidates, but clearly not valued in the same way by those who have supported themselves. Although these self-funded students would not be bound to a structured training programme in quite the same way, many institutions are now requiring all candidates to experience some form of research preparation. The structure and delivery of this varies at both the institutional and departmental level. Self and employer funded candidates would apparently be less enthusiastic to see a strong research training emphasis on their doctoral programmes. This suggests that professional doctorates with a different orientation, would attract candidates funded by these sources.

Figure 7.7. Candidates' responses and 'making a significant contribution to knowledge'



Graduates' views of making a significant contribution to knowledge are again shown to be more important in Figure 7.7 than the students. The above figure also highlights the greater value placed on this ideal by self-funded candidates. Candidates financed by a research council for example, exhibit slightly less concern with this concept. These varied perceptions suggest that individuals may strive to achieve different outcomes from the research process, and may have different personal expectations. Candidates funded by a research council will generally have three years worth of money in which to complete their doctorate. Perhaps they view this as sufficient time in which to fully make a significant contribution to knowledge. The different values placed on this concept may affect the kind of research conducted by these candidates. Self funded candidates for example may wish to embark on a more ambitious research programme to ensure that a significant contribution can be made.

Despite these differences, this notion is regarded by all as important. It still remains one of the key descriptors of a PhD, and appears to be taken very seriously by candidates. What 'significant contribution' means within different doctoral contexts is clearly open to interpretation, and whether it is an appropriate concept to apply to professional doctorates, is also debatable.

Figure 7.8. Candidates' responses and 'the ability to work at a distinctive level'

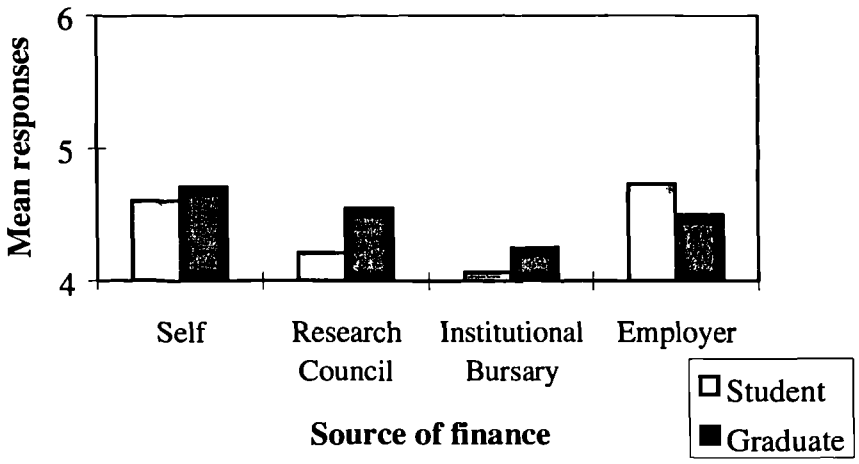
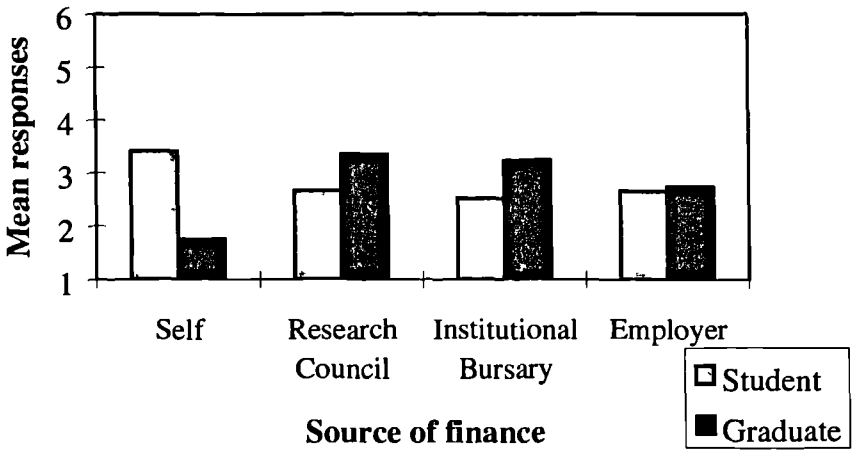


Figure 7.8 shows that working at a distinctive level received very similar views from candidates, all of whom considered this an important doctoral concept. This pattern was also shown in Figure 7.7 where a similar set of unanimous responses were obtained. Clearly this is a core belief about a doctorate and one expressed by candidates funded from a range of sources.

As displayed in many of the other figures throughout this discussion, the graduates' judgements were slightly higher than students. This is with the exception of those who were employer funded. This could indicate that some graduates were employed by managers who explicitly believed this ability was a valuable part of recruiting at doctoral level. Or the opinion could be more personally and experientially based, whereby graduates themselves considered that as a result of their doctorate, they were able to work at a 'distinctive' level. Whatever the explanation, the perceived importance of this ability suggests that this 'distinctive level' needs consideration. The deconstructing of what working at doctoral level means may be helpful for programme designers, delivers and assessors. However, the nature of 'doctorateness' would not necessarily benefit from being highly quantified, leaving little scope for contextual and individual flexibility and interpretation. Nevertheless, some shared indication of the qualities that a doctoral graduate could exhibit, may indeed be constructive for all interested parties, not least for candidates themselves.

Concepts perceived as unimportant

Figure 7.9. Candidates' responses and 'the ability to teach'



The ability to teach was the only concept to be unanimously viewed as inessential to notions of what a doctorate is. Figure 7.9 shows that it was generally regarded as unimportant or inappropriate by all candidates. This consensus of opinion was also expressed in Chapter 5 where teaching opportunities were not considered an important resource. An interesting feature of Figure 7.9 is that all graduates (with the exception of those who were self-funded), rated this skill as more important than students. This suggests that particularly those supported by a research council or institutional bursary, have obtained post-doctoral teaching experience, on the basis of their qualification. However, this teaching experience may not necessarily have been explicitly classroom based, but may have been interpreted as having a more facilitative nature implicit within their professional role. Having said this, teaching abilities are clearly not perceived as valuable doctoral products, and this has significant ramifications for the entire doctoral process. It is unlikely that the desire to teach forms a key motive for doctoral students and is similarly not an experience during the research process that many students would choose to engage in. Finally, these results suggest that doctoral graduates would not seek a teaching post as an ideal post-doctoral position. This clearly does not equate with the requirements for academic lecturing posts. Doctorates are increasingly being associated with teaching in higher education, arguably because of grade inflation rather than the specific teaching expertise doctoral graduates can bring to a programme.

Conclusion

- Similar views held about doctoral concepts
- Differences in opinion over how a doctorate should relate to a career

The process of enquiring about doctoral concepts, showed that relatively similar perceptions were held. Many concepts were viewed in similar ways by both students and graduates. Graduates' opinions showed more consensus than the students and frequently perceived the concepts as more important than those currently engaged in doctoral activity.

No clear pattern was identifiable among the concepts that created disagreement, those that were viewed as important and those regarded as unimportant. Value appeared to be ascribed to both human capital concepts and also to the broader functions of a doctorate. Whether candidates perceived these individual abilities as actual or potential is not known. Similarly it is not clear if candidates consciously drew on personal experiences when considering these concepts, or if an attempt was made to think more abstractly. However, the cluster of concepts that yielded the greatest disparity in student responses, showed tension in deciding where a doctorate should sit in relation to notions of a career. Some felt it was more associated with the initiation of a career, and some considered it more applicable for the culmination of a lifetimes' work. This suggests that a doctorate is different things to different people and is likely to be inextricably linked with their motivation. This is not intrinsically problematic, but perhaps reinforces the case for different types of doctorates to address different needs and doctoral aims. This is not just a divide between professional doctorates and the PhD, as clearly the PhD has many different guises. Flexibility within the overarching philosophy of doctoral programmes is essential, to ensure that the wide variety of candidates' perspectives and requirements are incorporated. Therefore, programmes must be clear what their theoretical base is, what the purposes are and what structures and resources are necessary in order to achieve this. This should enable candidates to select doctoral programmes that are right for them, both in terms of the protocols and the philosophy.

Introduction

The second part of this chapter explores candidates' perceptions of the distinctiveness of doctoral graduates. Students and graduates were asked what characterised a doctoral graduate as opposed to someone who had completed a Bachelors or Masters degree. This was structured into the questionnaire as an open-ended question. The discussion that follows is consequently based on the qualitative data received as well as themes that emerged from supporting interviews.

Description: Candidate' Perspective

Responses about doctoral distinctiveness did not seem to vary according to doctoral type, institution, subject area, mode, finance or age. Similarly no major differences were apparent in the results of the students and graduates. However, a number of characteristics were frequently highlighted as important, of which 'thinking independently' was clearly considered as a core feature of a doctoral graduate. This ability was consistently described by candidates as distinctive, something that did not occur to the same extent in other degrees. An EdD graduate said in an interview that 'the emphasis of the doctorate was on the ability to be an autonomous and independent worker and this should be a common capability developed by any doctorate'. A PhD student in the natural sciences endorsed this by saying 'the biggest difference between me as a student and the post-docs is their independence as they are capable of making decisions on their own and take the responsibility.' How independence is defined and fostered is an important issue to be considered by all interested parties, that will have implications for the structure and design of doctoral programmes. For example, the development of autonomy or self-reliance may well be enhanced by working within a critical community where ideas have to be discussed and defended. If this view is adopted, the organisation of the students' doctoral experience could be affected. The ability to independently design and conduct research, and the possession of specialised research skills were other areas that received considerable attention from candidates. This is something at the forefront of how distinctiveness is perceived, but not surprisingly this is regarded as particularly characteristic of doctoral graduates.

The most noticeable pattern arising from this analysis was the predominant attention paid to individual abilities acquired or developed during a doctorate. Clearly the human capital dimension to a doctorate is perceived as a fundamental outcome, correlating with the value placed in Chapter 4 on personal development as a doctoral motivation. The development and acquisition of personal capabilities are obviously an important part of the rationale for investment into doctorates by all involved. However, candidates' perceptions showed a noticeable emphasis on the cognitive aspects of human capital, in particular analytical and evaluative skills. For example, a PhD graduate from the social sciences said that a doctorate 'makes you approach subject matter analytically and that you never take anything at face value'. Another graduate from the natural sciences said that 'critical thinking is an essential component of a doctoral level thinker'. It was not clear whether candidates were speaking in actual or potential terms, but this is a very focused and restricted view of doctoral distinctiveness.

An issue that was debated with some candidates, was whether or not these distinctive features of a doctoral graduate could be exhibited by someone who had not necessarily been awarded a doctorate. Opinion seemed quite clearly divided. Some candidates perceived the process of doing a doctorate as the only means of obtaining the abilities demonstrated in graduates. Others clearly disagreed and considered many people to be working at 'doctoral level' who had no experience of a doctorate.

Discussion: Candidates' Omissions

Figure 7.8 shown previously in this Chapter, demonstrates that candidates regarded 'the ability to work at a distinctive level' as an important doctoral concept. However, when asked in the questionnaire about the distinctiveness of a doctoral graduate, results indicate that candidates had not really given due consideration to what the nature of this distinction was, and how it related to abilities demonstrated at other academic levels. There are three major considerations that candidates did not extensively address, that are arguably fundamental components of doctoral capability. The first concerns the ability to handle complexity on several different

levels. The second discusses the creation and nature of an artefact, and as a consequence, the third issues explores the transferability of graduates' skills and knowledge.

Handling Complexity

One of the most significant omissions in candidates' views was the lack of recognition for the complexity of contexts in which doctoral graduates may be able to work, and the complexity of their thinking. It is arguably the intricacy of situations that makes operating within them more demanding. Perhaps the distinctiveness of doctoral graduates involves this ability to operate within complex environments and convey detailed concepts. This analysis revealed that candidates identified a series of personal abilities and attributes, probably pertaining to many doctoral graduates, indeed some of which might be expected at other academic levels. For example, problem solving was highlighted as a characteristic, but there is nothing inherently high level about this skill. It is the complexity of the problem and the relationship of this task to other requirements, that may distinguish a doctoral graduate from other levels of working. The interaction of activities was not discussed by candidates nor was the complexity of the situations in which they are required to be applied. The environment makes the ability to comprehend and convey complex concepts more acute. The ability to organise and work with multiple tasks within unpredictable situations is an important part of a doctoral learning experience. Organisational and self-management skills play a key role in how a candidate handles these activities. The ability to juggle several different tasks at once, each of which draws upon different aspects of an individual's talents, is an important feature that may distinguish a doctoral graduate.

Creating a Product

The second distinctive element that was omitted from the results concerns the tangible outcome of the doctorate. For a PhD this is usually a thesis, whereas professional doctorates are more orientated towards dissertations or projects. Whether or not opinions vary depending on what the programme emphasises is unknown, but the value ascribed to the production of these doctoral products was

lacking in how candidates' viewed their own distinctiveness. The ability to produce this artefact was clearly not prominent in candidates' perceptions of what doctoral capability encompasses. This could for some individuals (PhD candidates in particular), be a result of them regarding three years as too short in which to make a 'significant contribution to knowledge'. Or it may be that the work is a component of a larger group project and the supervisors' emphasis is therefore on how it relates to the broader initiative. This is not to suggest that candidates don't value their thesis or the process of creating it, but that they don't regard it as a unique feature of their own capability. However the design and production of a large, detailed and analytical piece of work is a major distinguishing characteristic, certainly in relation to other academic levels and their associated products. This raises a question in relation to professional doctorates. As a result of the particular structure of many of these programmes, the assessment procedures are different from that of the PhD. The existence of compulsory modules as well as a dissertation means that a series of smaller arguments are being required, rather than the sustained argument of a complete thesis in a PhD. If these modules are discrete and the coherence between them is not made explicit, the magnitude of the concepts and the impact of the research could be reduced. This may be another reason why candidates had not considered the creation of the product as part of their doctoral distinctiveness.

While personal development is an important part of a doctorate's mission, the generation of new knowledge and understanding is also critical. Certainly with professional doctorates, the development of new practice or the critical examination of existing practice is an underpinning concept. The consideration of the impact of the work is an equally profound part of completing a doctorate and something that may have ramifications for a variety of professional contexts. Potentially this has more longevity than the personal dimension, as the formation of theory and the initiation of changes in application have significant, long-term consequences. This should feature prominently in graduates' self-perceptions, but apparently is something they do not regard as distinctive.

Transferability

The candidates in this sample evidently regard independence and personal, cognitive abilities as being a large part of their distinctiveness. This lack of recognition of the complexity of their talents, and the value of the product, may significantly affect their transferability. If candidates themselves perceive their distinctiveness in a fairly limited way, this will inevitably be conveyed to prospective employers. This is not to suggest that the cognitive skills are considered unimportant by employers, but rather to propose that they have greater value as part of a broader and more complex understanding of abilities. Doctoral graduates could and should market themselves as offering a unique package of strengths, that extend beyond thinking independently and applying research understanding.

Almost half of the graduates in the sample for this research were employed in positions that had explicitly required a doctorate, and were virtually all post-doctoral research posts. The other graduates had taken positions that had not specifically asked for applicants with a doctorate, many of whom were employed as lecturers or in educationally related professions. Of course this was a very small sample and the generalisability of these findings is limited. However, it does suggest that doctoral graduates are penetrating a fairly small sector of the employment market. Obviously their research skills make them desirable post-doctoral researchers, but the other, more generic characteristics should make them attractive employees by other professional and business organisations.

How candidates present and market themselves may be issues that need considering during the doctoral process. For some, careers guidance may be appropriate to identify possible sources of employment. Career advice at doctoral level is not normally structured into the experience, perhaps because there is a lack of understanding about the employment opportunities that exist, or because it is assumed that most graduates will remain in higher education. Gaining a broader perspective may be a valuable opportunity for candidates, especially given the diverse motivations discussed in Chapter 4 and the variety of doctoral programmes available. This need depends very much on the candidates' purposes for undertaking

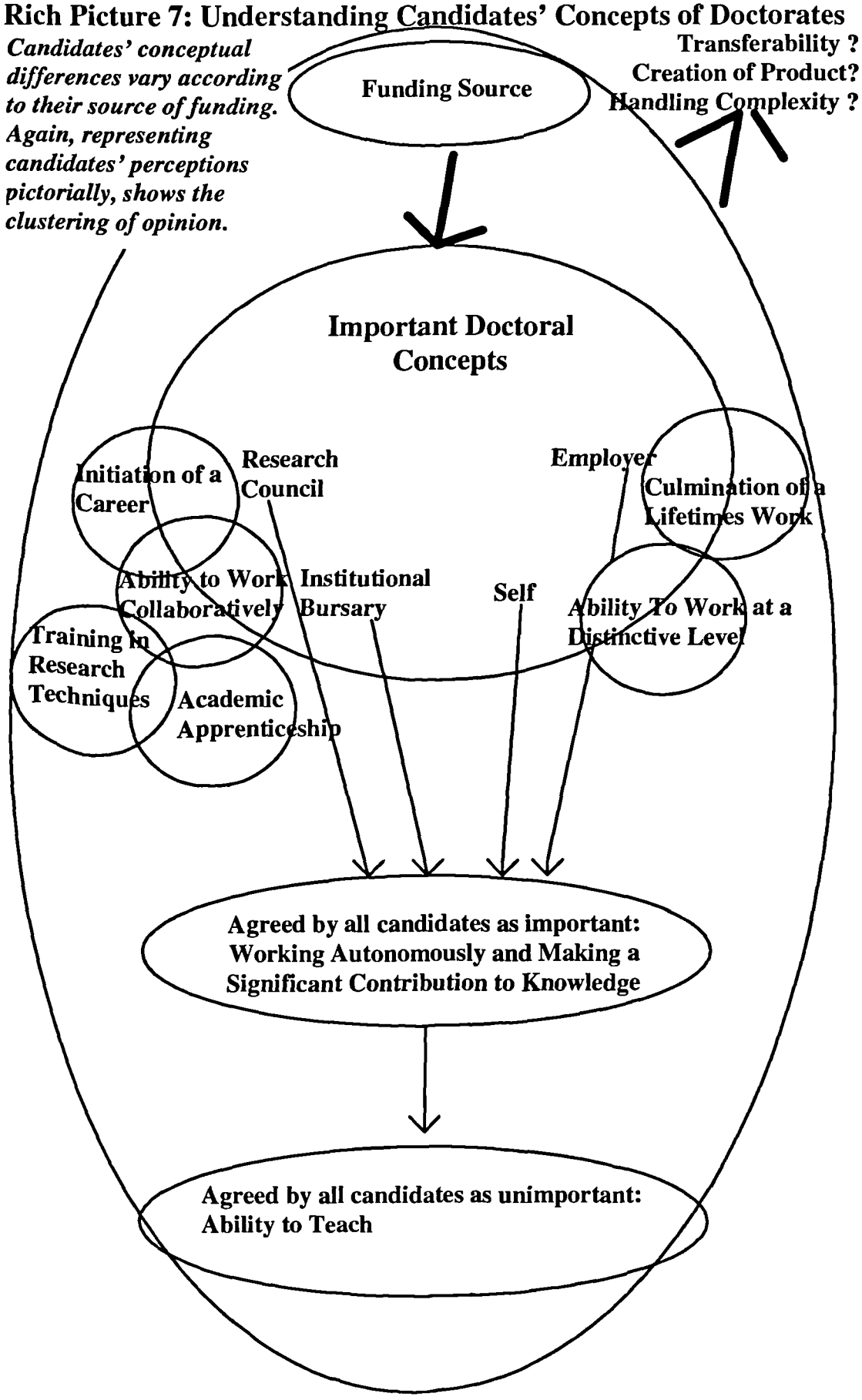
a doctorate, as someone doing it purely for personal satisfaction may not be so concerned with professional relevance and career development.

Conclusion

Whatever the reasons for candidates' distinctive focus on individual abilities, it is clearly not a reflection of their full potential and may in fact be doing them a disfavour. The lack of recognition given to the complex nature of candidates' capabilities and the impact that the product can make, personalises the process of doing a doctorate. Insufficient consideration of the tangible artefacts may mean that some perceive doctorates as having little benefit either within the academic community or in wider professional contexts. This individualises and in a sense trivialises the purpose, process and product of a doctorate. Rather than focusing on the collective and long-term impact that both candidates and their work may achieve, significance is only attributed to the candidate. How doctoral capability has penetrated and been regarded within different professional contexts is an agenda for future investigation, as would be an examination of the tangible outcomes of candidates' work. But for now, strategies for how doctoral candidates can be made more aware of their talents should be considered. Within the learning process, mechanisms by which candidates are forced to consider the implications of their work and transferability of their expertise, need to be accommodated.

Rich Picture 7 on page 222 represents candidates' conceptual thinking and shows the differences in opinion, depending on their sources of funding.

Rich Picture 7: Understanding Candidates' Concepts of Doctorates



Chapter 8 Personal Perspective

Introduction

This research has explored the perceptions of various parties with different vested interests in doctoral education. The emphasis has particularly been on candidates' perspectives and the views of other stakeholders has largely been discussed in relation to students' and graduates' opinions. As a result of the focus of the research and my own experiences being so interconnected, I considered it valuable to relate my perceptions and experiences to those of other candidates. In addition, the methodological arrangement designed for this research (discussed in Chapter 1), highlighted the ethnographic dimension as a distinctive component. The explicit presentation of my own experiential findings are therefore a very valuable part of the methodological principles. If the process of developing a rich picture is to be fully embraced whereby all interested parties are represented to some degree, the researcher is clearly a stakeholder of equal prominence. The following discussion adopts an issue-based approach that draws upon some of the major themes raised by candidates in Chapters 4, 5, 6 and 7.

Relationship of Purposes to Processes

My own purposes for embarking on a PhD generally endorse the responses given by the younger categories of candidates. The perceived enhancement of career prospects, the drive to expand my research knowledge and application, and motives that could be categorised as personal development were at the forefront of my determination. This was very much a conscious decision taken a year prior to obtaining a doctoral position. However a doctorate was not merely viewed as a mechanism to enable me to reach a particular professional destination, but it was embarked on with passion, both for research and for the anticipated skills and abilities that are associated. I suspect this is shared by many candidates, and it is arguable that passion is critical in order to maximise a doctoral experience, and to aid completion.

As a doctoral applicant, there was an institutional assumption that the broad concepts of what a PhD should include and what the experience entails, was known to me. This is certainly something that professional doctorates are being forced to address in order to distinguish themselves from the PhD, and consequently many programmes are making their purposes, processes and anticipated products explicit to prospective candidates.

When comparing my original motivations with the experience in practice, there are two interrelated themes, that differed in reality from my expectations. The first concerns the issue of 'research training', and the second relates to the ways of working during a doctorate.

This research indicates that there is massive variation in the research exposure and educational provision that occurs on doctorates within and between institutions and between subject areas (something also acknowledged by Delamont, Atkinson and Parry 1997, p319). However, it appears that the norm is to offer a platform of research understanding for candidates at the outset of their doctoral programme. This is obviously an important part of the formative process, but what I found apparent by its absence was the lack of continuing educational support in this area of research development. To some degree an individual student must be expected to be responsible for their doctoral experience, and should therefore be proactive in seeking out sources of research information. However, perhaps a more continuous theme of research provision could be considered. The introduction of specialist research seminars throughout the learning process may aid the development of skills in ways that reading or conducting research may not. This relates to the second issue about relevance. For all the research information to be given at the outset of the experience clearly provides a sound grounding from which ideas can flourish and applicability can be acquired. Nevertheless, to have a structure whereby inputs on different aspects of research coincided with the relevant phases that the student was experiencing, may have more theoretical and practical benefit.

However, this structured need for research training may not be so great if you are situated within a community of active students and post-doctoral researchers. In theory this provides a constant critical mass of researchers who can all contribute to the formative process. As it stands, many students who pursue a more isolated experience, may use their supervisor or supervisory team more than is normally expected, because they make up the students' only 'critical community'. If this exacting debate is considered such a valuable part of the doctoral process, not least by candidates themselves, they may ideally choose to do a doctorate where they are situated within a team of active researchers.

On a personal level, my colleagues were to some extent practising researchers given that publications comprise such a critical part of an academic's profile. However, because the emphasis of their work was predominantly on delivery and developing practice, research frequently took the form of an addendum. If interaction is a vital part of research training, does this imply that some departments or institutions do not have sufficient resources to accommodate research students and therefore may not be eligible? Potentially this could concentrate research students within designated environments, probably those that are prestigious and attract large amounts of research funding. This might indicate that dividing institutions into either research or teaching organisations is necessary, something that is currently a highly contentious issue. Research is an important part of informing and developing teaching theory and practice and vice versa, not least in the tutoring process of research students. This concept is not necessarily the answer, but arrangements for doctoral students is clearly something that needs consideration.

From a personal perspective, I would associate greater value with the availability of teaching opportunities than many candidates did, although clearly this experience may not be appropriate for candidates on professional doctorates. I would consider that my teaching experience has enhanced skills and abilities that may not have otherwise been developed. As a result of it being directly related to my doctorate, the two activities of research and teaching informed each other. Even for candidates not intending to embark on post-doctoral work that directly involves teaching, the

generic skills that come from this experience may suggest that relevant tutoring of some kind is beneficial to candidates' overall abilities. However, if teaching experience is disassociated with the focus of candidates' doctoral work, there is a clear argument for viewing it as an inappropriate distraction. It is therefore important to ensure that any teaching commitments (frequently required in exchange for a bursary), build on the focus of candidates' programme of study. By securing this, the contribution that candidates make and knowledge that they impart, is explicitly valued. For teaching to be a meaningful encounter during a doctorate, candidates should not be regarded as additional, cheap tutors. Although my teaching exposure has generally been positive and beneficial, it has been left to me to make it a success. There were stages where guidance and support would have enhanced this learning process. If doctoral graduates are using their teaching experience in some form, preparatory advice is critical to ensure long-term benefit for candidates and their future recipients.

Relationship of Processes to Products

This PhD has an applied nature in the sense that there is potential for different audiences to be tangibly affected by it. While it contributes to a particular body of knowledge and understanding, it also raises significant questions for broader consideration. This is somewhat different from the DProf candidates, who are expected to accomplish some kind of organisational change or professional impact within the scope of the doctorate. This notion of impact is a characteristic of all doctoral activity, but it has varying connotations depending on the programme type. The standard for the PhD is uniformly concerned with making an original contribution to knowledge, so there is a theoretical impact expected but no formal requirement for tangible change. This question of the product and impact of a doctorate, is something that certainly distinguishes the DProf from the PhD. The DProf allows scope for the outcome to take different forms, providing that the work has impacted within a variety of different contexts. Even other, more established professional doctorates have not adopted this as a distinguishing characteristic. Clearly, the products of PhDs vary enormously in their potential influence and in the kind of impact they may have, often depending on different subject areas or even on

the individual thesis. However, the results discussed in Chapter 7 suggested that candidates did not equate the thesis with the distinctiveness of a doctoral graduate, yet this is undoubtedly one of the major outcomes of the learning experience. The product is inextricably linked with certain capabilities developed in order to achieve this end result. The recommendation of results stemming from an individual's research effort to a broader community of practitioners, is certainly a significant distinction from other levels of academic work.

My appreciation of the personal outcomes resulting from the PhD process feels more acute than expressed by some candidates in Chapter 7. This is likely to be because the focus of the research was inextricably linked with my own learning experiences, so I was made consciously aware of stages of learning and what personal abilities resulted from them. On reflection I would endorse many of the attributes identified by the candidates that characterised a doctoral graduate. Autonomy and self-reliance feature prominently in how I consider my skills have developed. The requirement to independently design, conduct and manage a project from conception to completion is the mechanism through which these skills develop. This activity allows the researcher to have an understanding of the processes necessary at all levels, both in terms of the complex, cognitive activities and the mundane, routine practices. Being able to manage these different elements that draw on different aspects of an individual's talent, is certainly a feature of a doctoral graduate. The ability to draw together fragmented aspects of work and amalgamate concepts, is arguably something acquired through the doctoral process. Therefore, synthesis on both a practical and theoretical level is perhaps one of the most distinctive characteristics of doctoral capability.

The conscious identification and appreciation of attributes distinctive to a doctoral graduate is aided by reflection. Purposeful and constructive reflection can be in itself, a high level capability, but when applied to the long and intense experience of doing a doctorate, reflection can help to identify and map personal development. My personal experience of keeping a learning diary arose because of the need to explicitly recognise the ethnographic element of the methodology. It proved

incredibly valuable on several different planes. Firstly the regular recording of events and experiences is useful on a simplistic level for reference purposes. Secondly, the periodic revisiting of key learning moments enabled the significance of certain experiences to emerge. Cataloguing and reflection are important processes that also help the progressive development of personal abilities to be teased out. The diary also went some way to provide a critical friend, an interactive experience that was missing from my doctorate. Keeping a learning diary may be a method that other candidates could use to enable them to plot the development of their complete package of capabilities. In environments where there are sufficient numbers of candidates, seminars could be organised to discuss the distinctiveness of their abilities. Both candidates and universities must recognise the broader spectrum of doctoral outcomes and the transferability of skills to different professional contexts. Somehow, considering the implications of gaining these attributes and producing the work must be built into the candidates' learning process.

Conclusion

This discussion has shown that many of my experiences and perceptions mirror those expressed by other candidates. In some ways my doctorate has typified those undertaken within the social sciences and many of my motivations supported those expressed by younger candidates. The examination in the previous three chapters highlighted the strength of the candidates' views and signalled that they had clear opinions of what they did and did not require during a doctorate. Perhaps there is an argument for suggesting that candidates should be more pro-active in seeking out the right environment in which to study, and in ensuring that the appropriate resources are made available for their experience to be maximised.

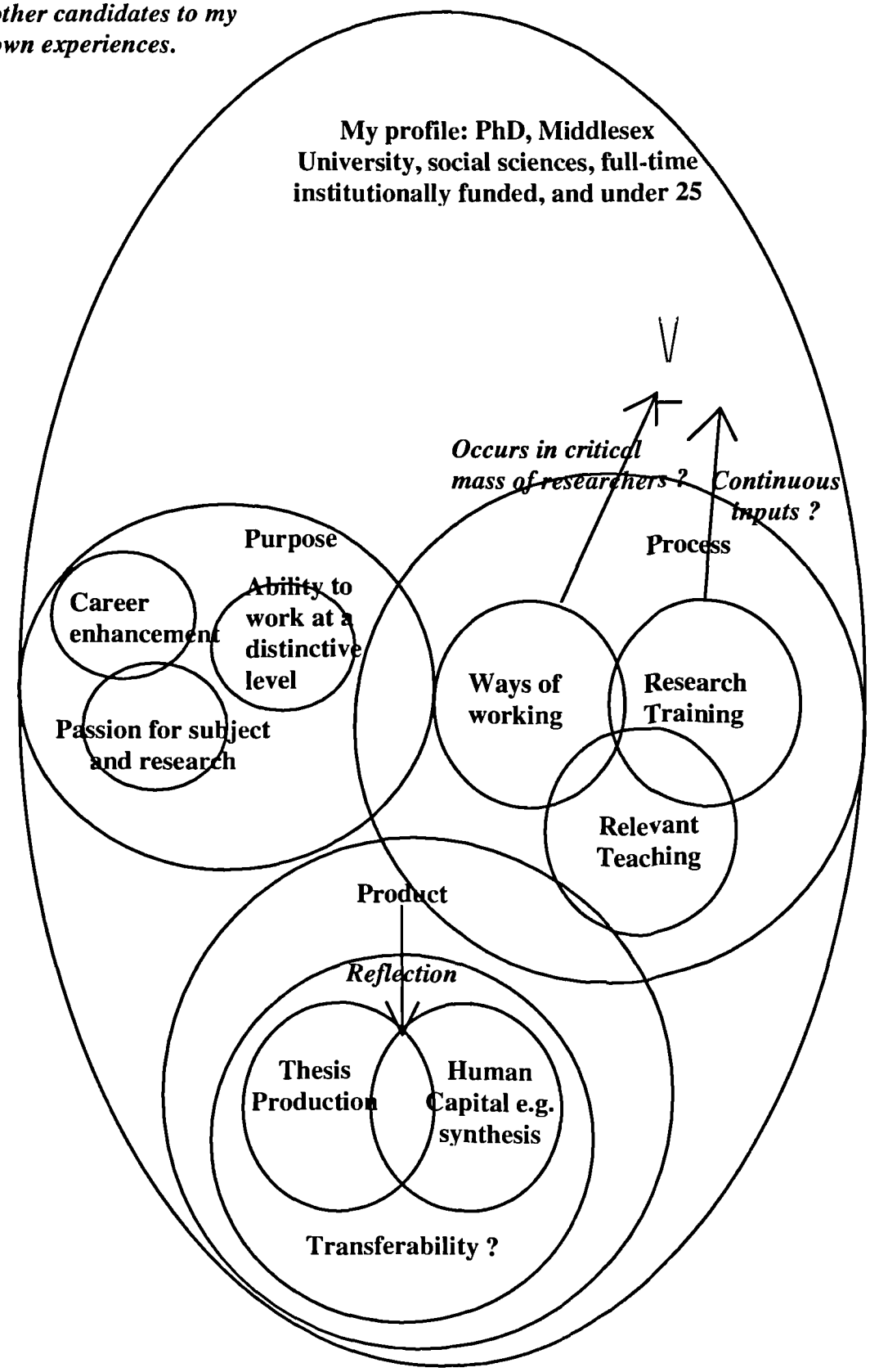
At one level, the relationship of supervisor and student could be seen as the most responsive educational process possible. However, experiences vary so significantly that quality of supervision is not uniform and the willingness of some supervisors to fully support students' needs is debatable. The previous chapters also acknowledge that supervision is only one of many key resources and experiences necessary during a doctorate. Some of the processes considered important require institutional

intervention in order for them to be established, and do not simply rest on the student-supervisor relationship. However, speaking personally, my supervisory team played a critical role throughout my doctorate, and perhaps more prominence should be given to this significant responsibility. Perhaps some form of preparatory training or guidance should be standard, as should incentives or rewards for taking on this task. For the experience to be constructive for both student and supervisor, good will and personal commitment are not always sufficient. Supervision must be valued highly enough for supervisors to want to allocate appreciable time to ensuring a quality experience for themselves and the candidate.

This discussion has explicitly acknowledged my role within the methodological arrangement. In hindsight the process of personally being immersed in a doctorate enabled me to have a better appreciation of the perceptions of other stakeholders, especially those of the candidates. Insights may not have been gleaned and values understood if the researcher had not been an active doctoral student. Certainly from the candidates' perspective, positive effects may have resulted from confiding in a fellow candidate rather than an outsider. This notion of being a participant observer has clearly had a profound affect on the processes of data collection. While this may be seen as clouding what could otherwise be 'objective' judgement, I would argue that the actions of internalising candidates' opinions, and be able to review them within my own doctoral practices, has added considerable value to the understanding of doctoral education. Rich Picture 8 on page 230 gives an indication of my perspective and shows that the purposes, processes and products of doctorates are in part, integrated.

Rich Picture 8: Understanding My Personal Perspective

The ethnographic core of the methodology enabled the explicit representation of myself as an interested party to occur. I was therefore able, as a doctoral student, to relate the perceptions of other candidates to my own experiences.



Chapter 9 Other Stakeholders' Perspectives

Introduction

A total of eight, semi-structured interviews with supervisors from all the institutional case studies were conducted as well as with a range of nine employers. These took place throughout 1998 and provide a snapshot of views and an indication of how doctorates are perceived by stakeholders who have a different involvement and vested interests in the process to candidates. It also provides an interesting comparison with the views of the candidates expressed in the previous three chapters.

The structure of this chapter continues the theme of purposes, processes and products of doctorates. In addition a section deals with the 'professional policy' of employers towards recruiting at doctoral level, whether or not organisations have positive recruitment strategies for doctoral graduates, and for what purposes they recruit them is explored.

Doctoral Purposes: Supervisor and Employer Perspective

Supervisors from all four institutions expressed some agreement over candidate motivation. Slight variation was found depending on whether the supervisor was associated with a professional doctorate or a PhD. PhD supervisors thought that candidates were primarily driven by several different forms of career progression. For example a supervisor from the Biochemistry Department at Imperial College said that 'career progression is increasingly the case as there is a more pressing requirement for a PhD for any research careers or careers in science'. A similar view was expressed by a supervisor at the NIMR who said that 'most of our students are looking to pursue a research career and a doctorate is the stepping stone'. This was also acknowledged by PhD supervisors at Middlesex who additionally raised the issue of internal staff doing PhDs. Generally studying on a part-time basis, their motives are perceived as being connected with staff development or 'needing a PhD for promotion'. In addition to career enhancement, some supervisors highlighted the

need for students to express a love of the subject as part of their motivation, and to 'want to pursue knowledge.' Some said that at the interview stage this need for curiosity is explored. While they acknowledged that this was the honourable side to undertaking a doctorate, it was still perceived by some to be an important dimension.

The views of those supervisors connected with professional doctorates was not significantly different but placed more emphasis on students being driven by personal development. Much less attention was paid to connecting doctorates with career development. The supervisors also raised issues about the structure and focus of these programmes that made it more realistic for working professionals to undertake a doctorate. In addition the development of research skills was perceived as an important motivation for candidates undertaking these programmes.

Discussion with employers revealed that little attention focused on doctoral motivation. Instead there was a clear emphasis on the product of a doctorate in human capital terms and the relevance or not, to their organisation. However, when prompted, career progression was perceived as an important consideration. Employers generally thought that students started a doctorate as a career enhancing tool, largely for an academic post, but also for research related work outside the university sector. Some employers supported doctoral study much more if employees undertook it as an in-house exercise. This indicates an expectation of professional relevance that again is tied to the idea of career development. There was a general, underlying assumption among employers that the majority of doctoral candidates are young and in the initial stages of their professional career. This view clearly differs from the age-range of candidates discussed in the previous three chapters, showing people of all ages embarking on doctoral activity.

Comparison with Candidate Perspective

Some of the themes raised by candidates in Chapter 4 have also been mirrored by supervisors. Students doing PhDs were generally perceived to be more concerned with enhancing career prospects than those doing professional doctorates.

Developing research competence was also regarded highly by nearly all supervisors who saw this as important for candidates.

However, there are also some significant differences in opinion between candidates and supervisors. For example, the major influences on how candidates responded were their age on completion and their mode of study. Neither of these factors emerged strongly from discussion with the supervisors. Of course they may have implicitly influenced supervisors' responses, but this was not apparent in conversation. Many of those supervisors interviewed, perceived career development both in and out of academia as a uniform reason for undertaking a doctorate. However, the candidate perspective shows that age was a major influence on how important this purpose was perceived to be. The main motives that emerged in Chapter 4 (personal development, the development of research skills and the development of specialist knowledge), clearly received differing treatment by the supervisors. To varying degrees the first two were certainly raised, but the last motive was not emphasised as important. Evidently there is disparity in the perceived value of specialist knowledge, appearing to be an important factor for candidates but not as paramount for supervisors.

Perspectives from employers generally supported the supervisors' opinions and therefore obviously differed from candidates. Employers also thought that most of those who undertook a doctorate were doing so for career development purposes. Some only talked in terms of entering academic work, and some considered a broader remit of entering non academic research. However these views associate doctorates primarily with the initiation of a career, something the candidate perspective showed is not always the case. They also imply that the majority of doctoral candidates may be in the early stages of a career, a pattern which again is not uniform.

Doctoral Processes: Supervisor and Employer Perspective

Supervisors from each institution were asked to identify the key stages of a doctorate and many common processes were revealed. A supervisor from Middlesex

University highlighted six key phases of a PhD. The first involved the identification or definition of a research question, problem or hypothesis and is largely the students' responsibility. Secondly they were expected to review the theory underpinning the associated field and then to devise an appropriate methodology to answer the question, solve the problem or test the hypothesis. The fourth stage was an empirical one with qualitative and/or quantitative outcomes that must then be analysed and discussed. The final stage was the identification of major conclusions and implications for practice and further research. This structure was generally agreed upon by PhD supervisors from all four institutions, but with variation in the initial stages. Supervisors at the NIMR described how the topic choosing stage is largely pre-defined by the supervisor. He or she will invariably have a project for the student to come and join, although there is some room for negotiation. A similar pattern appears to be followed at Imperial, suggesting that the responsibility for conceiving doctoral research varies between the natural and social sciences.

Supervisors were asked how they valued three elements of a doctoral process; the acquisition of a subject specialism, research skills and personal development. Most supervisors regarded personal development as an important process that contributed to the successful completion of a doctorate. A supervisor from Imperial College stressed the importance of oral communication as a feature of personal development. A description was given of how students are required to give a talk to the whole department in their final year. This gets them to express themselves in a way which is accessible to a wide range of understanding. It was said to represent the culmination of them thinking intellectually about a problem, learning how to tackle it, interpret and finally communicate the results. Research skills were also considered important but many supervisors regarded the specialist subject knowledge as the least important factor, given that it can quickly become dated. A differing view was expressed by some supervisors who thought these three dimensions were inseparable and all inextricably formed important parts of the doctoral process.

An Imperial College supervisor described the effect that the increasing competition for research student places was having. More criteria were having to be devised in order to make distinctions between applicants, increasingly resulting in recruiting people with some form of research experience. This was generally said to be in the form of a Masters award, a year in industry or where the applicant had held a Research Assistant post. This experience was viewed as 'evidence that they could apply their research skills and understanding'. Clearly this raises an issue about what level of research capability is required for admittance onto a doctoral programme. This expectation affects the attitude to research 'training' and consequently has implications for the structure of the doctorate.

A number of supervisors commented on the processes that should exist during a professional doctorate. One thought that the action of formalising questions and the means of answering them should be common to all doctorates, as should the ability to present and communicate the end results. However the content and focus of the research should remain distinct. Another supervisor saw the research question arising out of the work context for these professional doctorates, and that this should be reflected throughout the programme. She said that these doctorates should also address the relationship between theory and practice in a more tangible way than is often done in a PhD.

Ways of working and the environments in which students are situated were discussed by several of the supervisors. Those based in the natural sciences appeared more concerned with truly integrating the students into the organisation and enhancing the community of researchers. One said that a Graduate School would be a good vehicle for achieving this. Another from the NIMR said he considered the student experience to be enhanced by the good supportive networks at this institution that made the PhD much less isolated. In contrast an education based supervisor said that 'the process of a PhD is still lonely but only a problem if you consider it to be one and actually there is virtue in this as it fosters self-reliance'.

When asked to value the three processes involved in a doctorate (subject specialism, research skills and personal development), several employers focused on improvements that could be made. Their emphasis was similar to the supervisors in that they focused on personal growth, but distinct because they argued for more attention to the development of individual qualities. Good oral communication and presentation skills were highlighted as important attributes by some employers who felt that these were poorly exhibited in many doctoral graduates. This was consequently viewed as an important experience to structure into a doctoral programme. The inclusion of management training was also suggested as an improvement. Some employers said that management was a role expected to be fulfilled by many doctoral graduates and was in some cases why they recruited at this level. However, an explicit awareness and understanding of self and people management was not always demonstrated. One employer said that 'many graduates clearly have management potential, but if during the doctorate they had been made more aware of it, they would come to us able to use these skills'.

Another employer stressed the importance of reflective practice. While he knew this was not an explicit, structured input within a doctoral programme, he said that 'self reflection and awareness is an added benefit in a graduate'. He also felt that self reflection was an inherent process during a doctorate, but was not recognised by many graduates. Being able to consciously apply oneself to this activity, was regarded as an important part of thinking and working at this level.

The supervisory process also received some attention from employers. Some viewed the relationship of student to supervisor as merely 'satisfying the needs of an individual.' This was criticised as having little bearing on the styles of working at work and one employer related this point to the structure of professional doctorates. He said these programmes should 'attempt to reflect the real-world processes of negotiating, persuading and compromising within a team of people.'

Comparison with Candidate Perspective

The views of the candidates generally corresponded with those of the supervisors. Candidates valued the development of personal skills as an important part of the doctoral process just as the supervisors did. Candidate opinion of different ways of working during a doctorate also related to the supervisors' views. Emphasis on integrating science students into the research community was supported by candidates from this subject area, who were significantly more concerned with collaboration and joint working than those from other disciplines. The importance of the context of the research student expressed by some supervisors was reflected in the candidate responses, who all regarded an academic environment as an important feature of the doctoral process.

Variation occurred in the perceptions of candidates when compared with employers. The employers' emphasis on the need for management training and development of business acumen during a doctorate, was not supported by candidates. They regarded business training and work experience as unimportant features of the doctoral process. However, the mention of reflective practice by one employer is slightly akin to the value placed on appraisal by all candidates. Interestingly the DProf students rated this very highly, indicating that the opportunity to review and plan are important features of professional practice.

Doctoral Products: Supervisor and Employer Perspective

This section first discusses the perceived conceptual understandings of a doctorate. Secondly the distinctiveness of a doctoral graduate is explored from the standpoint of both supervisors and employers. The next section will then examine how graduates with doctorates are regarded by employers and if any organisational structures exist to specifically recruit them.

Little variation existed in supervisors' views about the essence of a doctorate. No clear institutional patterns were apparent and no other major distinctions were found. Some considered 'an academic apprenticeship' an appropriate concept for a PhD. This suggests that a PhD is increasingly becoming viewed as a minimum

requirement for any research or teaching position in higher education. This was endorsed by a supervisor who said it was a 'rite de passage' to becoming a supervisor, although he did acknowledge that 'experience also counts for a lot and is very valuable in conjunction with a doctorate'. One questioned whether or not a PhD was the best preparation for an academic career and said that it depends what you expect academics to do. 'It certainly gives you academic confidence which is very important but the subject specialism may well become redundant. This makes the other personal skills obtained during the doctorate more important'. A supervisor on a professional doctorate stressed the importance of research expertise and appropriate use and application.

Considerable consensus of opinion about the distinctiveness of a doctoral graduate was found among the supervisors, with no apparent pattern within or between institutions. Interestingly, little variation existed among the views of those involved on professional doctorates compared with the PhD. The ability to multi-task was frequently highlighted as a key attribute and especially necessary in 'the final year where responsibilities and instability may increase'. The ability to manage oneself and others was also raised as an important outcome, and so was the skill of remaining focused for a long period of time.

The views of employers were also closely aligned with each other but did not entirely match the supervisors. One recruiter of science graduates said that a PhD 'should not be about providing an academic training because there aren't the jobs for them to go into, and increasingly PhDs are entering other science or research based professions'. He argued that the purpose of a PhD should concern a broader remit, even though many still enter academia. Another employer made a similar reference to the changing nature of the PhD. He said that 'traditionally the purpose was to undertake cutting edge research and make a significant contribution to the relevant field, but as more people begin PhDs, not everyone can make such a breakthrough'. He went on to say that a PhD is now much more of a training exercise, both technically and cognitively. This development of technical skills was also discussed

by another employer who saw the purpose of a PhD as 'a means of obtaining a knowledge of methods and learning to research independently'.

Although the employers questioned had no or minimal knowledge of professional doctorates, some considered the relationship they should have with the PhD. When asked about features that should conceptually distinguish these professional programmes, one employer said that 'research should perhaps be wider than in a PhD as well as covering something in-depth.' Another said that 'they should still involve disciplining the mind but there should also be a strong demonstration of business awareness and contextual professional understanding.' Features common to the PhD and professional doctorates were explored by another employer who said that 'they should both recognise academic achievement and should be entirely students' own work and the fruits of their labour'. Most employers appeared to support the ethos of professional doctorates and several said that they envisaged more collaboration between industry and academia, particularly at the research and development level. One employer in particular suggested that this may make the PhD more applied but that 'there should still be room for serendipitous research because breakthroughs are often made this way and not everything should be intentionally commercially orientated'.

When asked about capabilities particular to a doctoral graduate, many employers instead responded with their approaches towards recruiting graduates as employees. Some do not recruit at doctoral level but those who did considered the knowledge of research as an important distinguishing characteristic. Several felt that the knowledge and abilities of graduates were too specialised and could not divorce this view from attributes that might be more transferable. However some employers who clearly did recruit at this level, did talk of more generic abilities. The management of others and self-management skills were particular features raised by some employers. These views share some similarity with those of the supervisors and the employers' perspective on doctoral recruitment is further explored in the next section.

Comparison with Candidate Perspective

Comparing the candidate perspective with the views of supervisors and employers revealed some common views as well as considerable disagreement over conceptual understandings of doctorates. As shown in Chapter 7, candidates' source of funding most influenced how they responded to this question, but this was not explicitly discussed by the supervisors. Many regarded a PhD as a preparation for academic work, an opinion shared by those candidates funded by a research council or institutional bursary. Those who were self or employer financed did not consider this an appropriate concept. A similar pattern was followed when candidates were asked how important the initiation of a career was to their understanding of a doctorate. Again, this was valued most by research council funded candidates and not by those who were self or employer funded.

A training in research techniques was important to some candidates and also raised by employers, who viewed researching independently as a valuable concept. This was agreed by all candidates who regarded the ability to work autonomously as important. However some disparity was displayed over how significant doctoral research should be. Feelings expressed by some employers indicated that a significant contribution to the field was not necessarily an appropriate doctoral concept. In contrast all students regarded this as a very important notion.

When asked about the distinctiveness of a doctoral graduate, a great deal of similarity between the student and graduate perspective was revealed. Therefore for all candidates, the ability to think and learn independently and to conduct research autonomously were the most important features. The concept of self-reliance was followed by originality for the students who rated this as their second most important factor. However this was not regarded as so important by the graduates who raised the idea of carrying work through to a conclusion as a distinctive characteristic. One pattern emerged showing that PhD candidates regarded the possession of specialist research knowledge more importantly than professional doctoral candidates. Other differences between professional doctorate and PhD candidates were apparent. For example, the EdD candidates rated making a contribution to the academic

community more important than those associated with a PhD. Hence, some overlap is evident between the candidate perspective and those of the supervisors and employers.

Professional Policy

Interviews conducted within the confines of this research have targeted higher education institutions as major doctoral employers as well as representatives from private sector organisations. This section tries to explore whether organisational policies and strategies exist to positively encourage the recruitment of doctoral graduates. Figures from HESA give a broad picture of graduate employment trends that offset the more qualitative insights provided by the interviews. The 1996/7 'First Destinations of Students Obtaining Postgraduate Qualifications' showed that there were 7055 known doctoral candidates in this period, the vast majority of whom entered full-time paid work (p16). 1146 of these had graduated from the biological sciences compared with 484 from social, economic and political science, and 142 from education. HESA employment categories showed that most doctoral graduates entered 'professional occupations,' nearly 3000 of whom were recruited into 'education'. The sub-groups of this category comprise primary, secondary, general secondary, further education, higher education, adult and other education. 'Property development, renting, business and research activities' also received a considerable number of graduates, particularly those from biological sciences.

While obviously the majority of graduates entered education related professions after completing their doctorates, the HESA statistics showed a much more dispersed employment pattern for graduates from the biological and social sciences than from education. However, figures compiled by the Biochemistry Society for their 1996 Annual Survey of Biochemistry Graduate Employment explains this pattern. Just over 40% of PhD graduates entered academic research posts, followed by nearly 14% entering industrial research. There was also a reported rise in 'science-based non-laboratory' work, comprising nearly 6%. Although these candidates evidently show a more scattered direction than those from education, the trend is clear. This

shows several clearly identifiable employment routes, all of which are research orientated.

Alternative patterns of recruitment for social science and education graduates appear difficult to identify. Although social science encapsulates many subject areas, trends like those of the biochemistry graduates, are not apparent. Very few education graduates entered employment that was not educationally related. Whether or not this is the graduates' decision or because they have limited employability elsewhere, is unknown. These statistical patterns are obviously very broad, but they do suggest that the majority of doctoral graduates are currently entering employment in the public rather than private sector.

The interviews revealed a mixed response concerning doctoral recruitment. Some organisations had positive employment strategies for applicants with this qualification and some did not. Variations in the level of value attached to a doctorate was also apparent. For example, some of the large consultancy companies said that they tend to recruit applicants with a first degree or Masters and 'to have a PhD is of no advantage.' These organisations also claimed that they actually get very few applicants with doctorates. One representative said that their company prefers to recruit at first degree level and has its own Graduate Training Scheme through which some employees undertake further study. This was described as ensuring professional relevance but was unlikely to extend to undertaking a doctorate. A related view was expressed by a representative from the Association of Graduate Recruiters who said that 'postgraduates in general have no premium attached to them in salary terms unless the subject specialism is particularly useful.'

In contrast, an employer from a multi-national pharmaceutical company said that they have a policy for actively recruiting doctoral graduates. This is primarily for research and development posts but by no means exclusively, as they are employed in a range of positions from a variety of subject backgrounds. However, according to a representative from the University of London Careers Service, the majority of these may be from scientific disciplines. Large pharmaceutical companies were

identified as major recruiters of science doctoral graduates. The representative from the pharmaceutical company stressed that as well as the qualification, 'the right approach is looked for before the subject specialism, as this can often be acquired later.' However, this quality was not viewed as solely being of doctoral level, as 'flexible, adaptable, broad thinking individuals are required with some subject knowledge, but these are skills highly dependant on the individual and are not necessarily associated with any one academic level.' A similar view was given by the Association of Graduate Recruiters who said 'the greatest need in today's market is flexibility and adaptability and this is just as applicable for doctoral graduates'. Nevertheless, a number of key attributes were notably sought from doctoral applicants. Leadership potential, the ability to encourage teamwork, the ability to cope with change and take responsibility and ownership for the creation of research, were all identified as being required from doctoral graduates.

This same company also rated in-house training highly and again a preference was expressed for encouraging employees to embark on a PhD within the company rather than recruiting externally. Often 'PhD graduates from other companies or institutions are only subject specialists and we are very much looking for a rounded individual.' This was endorsed by the Managing Director from another pharmaceutical firm. He stated, 'we are looking for a rounded individual with a package of capabilities and not just research skills.' This company does not have a policy for specifically recruiting PhD graduates. According to the director, 'we draw up a list of requirements we need from a position and the qualification generally comes second'. This is a view similar to that expressed by the London Careers Service. It was said that 'research skills are not the only reason for recruiting people with doctorates and it could be for a whole host of reasons just as it is at undergraduate level'. The variety of doctoral programmes with different structures was recognised and it was said that generalisations about employment could not be made. Despite this view, the Managing Director of the previously mentioned pharmaceutical firm, said they do have some senior employees with PhDs. Most of the customers of this company are academic scientists from universities and the employees with PhDs can 'usefully work alongside the academics and be

comfortable in the customers' peer group.' They are also regarded as attractive because they know the research environment; 'they know how to research and they have a science base which fits the company's underpinning'. Again, like some of the aforementioned, this company also encourages staff development but not to PhD level, 'it is not constructive for employees to spend a lot of time researching on one area.'

Those responsible for recruitment within an international oil company supported this need for 'flexible and rounded individuals.' This company does have a policy for recruiting at doctoral level and again largely for roles within their Research and Development Unit. It was considered less likely that doctoral graduates are employed for their 'subject expertise' and more for their understanding of research processes. He also noted that no-one involved in the management of the company had a doctorate. Although the recruitment does extend to doctoral level, the essence of the policy is fitness for purpose that does not necessarily correlate with particular academic qualifications.

Interestingly no employers were familiar with professional doctorates but most were favourable towards the concept. There was disagreement as to whether or not graduates from these programmes would be able to transfer to a research and development post, given that the research is often specifically orientated towards their own profession. Concern was also expressed about the quality and standard of the research and consequently the calibre of the graduates.

Conclusion

Before teasing out some of the main themes that have emerged in each of the four sections, a number of general observations should be raised. Little variation seemed to exist between the views of the supervisors involved in either professional doctorates or PhDs. However, there did seem to be disparity in the views of candidates, supervisors and employers, not surprising given that they all have different vested interests in the doctoral process (this disparity is reflected in Rich Picture 9 at the end of this chapter which tries to show the relative proximity of

opinions). Nonetheless supervisors' apparent lack of familiarity with some of the candidates' views, could have important consequences for the effectiveness of a doctoral programme. For example, a fuller appreciation of the variety of motives that students have for beginning doctorates and their opinions about resources and ways of working, could provide a more responsive experience. This in turn may improve completion rates and because of the increased relevance to students' needs, may result in more long-term benefit. Obviously this is not just a question of providing a programme that only satisfies the needs of candidates, as the perspectives of other interested parties clearly have to be addressed, not least of academia. However, the principle of getting in touch with candidates' needs and taking them seriously in the programme design stage, is important.

This leads to another related observation concerning value. It was apparent from discussion with both supervisors and employers that mixed opinions existed about the importance of doctoral students and graduates. This was both within the academic context and the broader employment market. Some supervisors who stressed the need to integrate research students into the academic community implied that candidates were respected and treated as research staff. This kind of attitude was also expressed by some employers who evidently had seen tangible benefit in recruiting doctoral graduates. In contrast, less positive views of the value of research candidates were also held. This is not to suggest that the only way of attributing value is by emphasising a collegiate experience, but merely to indicate that significantly different attitudes towards doctoral candidates was noticeable. Without doubt candidates are not a homogenous group and neither are supervisors or employers who have clearly had very different experiences with candidates. Professional respect and integrity must be earned, not least by candidates themselves. However, this question of the perceived value of doctoral students and graduates is important to consider for all who have a vested interest in the doctoral process. This is particularly so, given the diverse range of candidate profiles with differing knowledge and experiences.

The reasons for candidate engagement with doctorates has been generally seen as uniform by supervisors and certainly by employers. They have presupposed that candidates were primarily motivated by career enhancement. While clearly this does apply to a large proportion of those who undertake doctorates, the candidate perspective has shown a much richer and more complex picture. Both supervisors and employers treated the candidate body as uniform and neither discussed any factors that might significantly affect and vary doctoral motivation.

Clear differences emerged in the role that the candidate plays in initiating the research, depending on the subject area. The degree of responsibility expected of the doctoral student at this stage, appears greater in the social sciences. Whether or not different skills are fostered as a result of this is unknown and how this difference is valued is also debatable. Examining the processes of a doctorate also revealed differences in the ways of working. Depending both on the type of doctorate and subject area, the degree to which collaboration formed part of the experience varied. Both PhD supervisors and candidates in the natural sciences placed greater emphasis than their social science counterparts on joint working. The process of joining a project necessitates working with others and immediately offers a forum to test out ideas in. This may mean that these science candidates learn to debate and present concepts in a critical community, something not generally reflected in the social sciences. This greater sense of collegiality may also enable candidates to get breadth of understanding from work carried out by colleagues.

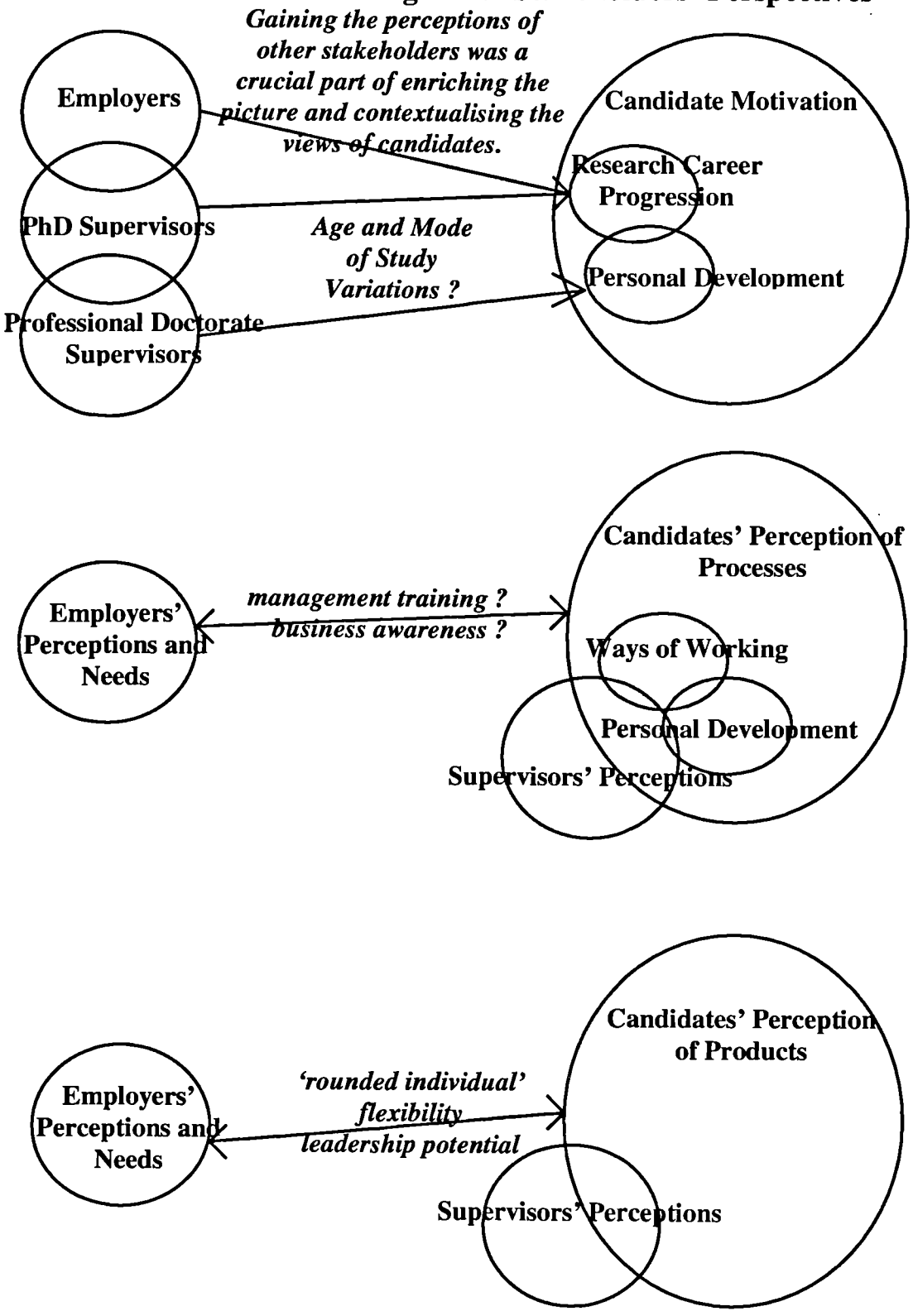
The concept of community learning was also apparent from discussion with those associated with professional doctorates. All involved seemed committed to learning with others as well as working individually. Some supervisors and candidates recognised that a professional doctorate should reflect the way of working in the workplace, something also suggested by one employer. However this idea of bringing aspects of professional practice into a doctorate was not so strongly supported by PhD candidates. For example, tension existed between the employers' emphasis on business awareness and management experience, and the contrary views of candidates. This disparity between why some employers recruit at doctoral

level, and what programmes explicitly focus on developing, is clearly an issue that warrants further debate.

Not surprisingly, employers were much more concerned with the human product of a doctorate than either the purposes or processes. A strong emphasis on the concept of a 'rounded individual' emerged, that has possible implications for the design of a doctorate and also for how candidates market themselves. Personal development is clearly considered an important dimension of a doctorate by all interested parties and must contribute to the notion of a rounded individual. Consequently this should form a fundamental part of a doctoral experience. How 'personal development' is defined and whether it is implicitly or explicitly nurtured, are important questions to address. However, what is apparent is that a doctorate alone is not a ticket to any profession. Therefore the development of desirable individual skills and abilities during the process is crucial, especially for those intending to use their doctorate for career purposes. These candidates in particular, need to be aware of the conditions affecting employability and take the views of recruiters seriously. If the candidate is aware early on in their doctorate of factors that abet and impede their employment prospects, they may wish to pro-actively address them.

The package that a doctoral graduate can offer may vary significantly, depending on a range of factors. The particular profile of an individual, the type of doctorate undertaken, the institutional context, their motivation and experiences throughout the programme, all lead to different end results. Candidates themselves need to be aware of their distinct package of capabilities and its relationship with different types of employers. Employers also need to be conscious of the fact that graduates are not homogenous and particular candidates who have done particular programmes may have very different attributes.

Rich Picture 9: Understanding Other Stakeholders' Perspectives



PART 3 TOWARDS A FULLER PICTURE

Preface

The fullest picture of perspectives on doctorates was shown at the end of Part 2. Candidates' perceptions of the purposes, processes and products of doctorates were examined and opinions of other stakeholders were discussed in relation to these. Part 3 explores how this picture contributes to our understanding of doctoral education, the questions it raises and what further study and action are needed to enhance it.

Chapter 10 Conclusions, Observations and Recommendations

Introduction

The aim of this research was to provide new insights into the changing nature of doctorates through investigating stakeholders' perspectives of the purposes, processes and products of doctorates. The main focus has been on the candidates' perceptions, but the views of supervisors and employers have also been examined in relation to these. This research has provided new insights into and understandings of perspectives of doctoral education and the exploration and the findings are both topical and of long-term interest. This chapter highlights five broad areas where the key outcomes of this work could potentially impact. The first area is concerned with the outcomes that will be of national and political interest. The second explores some valuable academic issues that have arisen, academic both in the sense of theoretical understanding and questions that higher education institutions will have to address. The third section discusses implications for work based learning, and the fourth deals with methodological implications that result from the strategies adopted for this research. Some personal outcomes of undertaking this research are then raised and these lead into the final section where the limitations of this research are recognised, suggestions are made for further work, and the main recommendations are specified. Finally, Rich Picture 10 at the end of this chapter highlights the contribution that this work has made and shows that most attention has been paid to candidates.

National Policy Implications and Outcomes

This study has been timely because of current attention that is being paid to research training by the Research Councils. In particular, activities currently occurring within the ESRC Consultation Exercise that is re-examining research training, provision and longevity are beginning to address more generic issues about the purposes of doctoral education and the relationship of professional doctorates to PhDs.

Significant policy implications and outcomes arise from the value placed on most of the fourteen resources discussed in Chapter 5. These were library access, regular supervision, computing facilities, subject specialist equipment, research expenses, conference access, peer support, academic environment, teaching opportunities, additional study, personal skills development, appraisal, work experience and business training. This suggests that these are expected and necessary for successful completion of a doctorate. In order that these core resources are ensured, appropriate quality assurance systems need to exist to audit institutions about the adequacy of their provision and delivery. This would need to be of a different nature from undergraduate arrangements and may require a more specific and higher level of scrutiny. This institutional review of doctoral provision is an important issue for QAA to consider in order that the quality of candidates' experiences are ensured. Completion rates could improve as well as the overall capabilities of the researcher. As doctoral stipends are uniformly modest, the importance of the experience is a priority. It is clear from the research findings that reward and value is unlikely to occur in financial terms during the doctorate (certainly for PhD students, perhaps less of an issue for professional doctoral students), making other forms of appreciation fundamental. The issue of valuing doctoral candidates may become heightened with the increasing number of senior professionals engaged in professional doctoral activity. Clearly these are candidates who expect and command respect and where meagre stipends do not normally apply. If PhD students and the contributions that they make are to be valued, stipends must competitively reflect economic trends and undertaking a doctorate must present a viable, financial option. This is fundamental for research councils to consider in order that the continuation and longevity of quality researchers is ensured. Institutions and research councils should also acknowledge the widespread value attributed to different ways of working during a doctoral process. The provision of a community of researchers who are able to support and contribute to the doctoral student's learning experience is something that needs to be seriously considered, especially by those institutions and funding bodies who are concerned with the development of social science researchers. The lack of distinct post-doctoral researchers in these associated subject

areas, may well be having a long-term impact on the progressive development of research in these fields.

One of the major differences between PhDs and professional doctorates is that many professional doctorates require sustaining a series of discrete but not necessarily interrelated arguments. Some are also not required to provide a rationale for how the doctorate is greater than the sum of the parts, and how it is thematically whole.

It is apparent from this study that professional doctorates are of a qualitatively different nature which raises various questions. For example, do we accept that doctorates of different types and from different subject areas should never be the same ? If we accept that different experiences are had and necessary, how do these different processes relate to the outcomes, and how does this equate with a uniform doctoral standard ? Professional doctorates are effectively claiming that different experiences equate with the same standard, so how can this be ensured ?

One way of tackling these issues is to un-pick the notion of doctoral capability, both generic, core characteristics and subject or professionally specific ones. Arising from Chapter 7 was the need to extend the concept of capability beyond the intellectual capital of the individual, and to encourage candidates to realise their ability to manage a project, produce a potentially influential piece of work and to consider the transferability of these skills. Candidates focused heavily on individual, cognitive abilities, decision-making and 'thinking and working autonomously'. There was an apparent discrepancy between the views of candidates and those of other stakeholders, who expressed needs and expectations that did not equate with PhD provision or with the views of candidates. 'Leadership potential' and 'coping with change' were not identified by any candidates as distinctive characteristics, yet highlighted as valuable by some employers. These differences however, are beginning to be resolved within professional doctorates, which are seeking to address needs beyond those that are academic. The DProf goes further still by explicitly involving employers or relevant, professional colleagues in the formative stages of the doctorate. Capabilities enhanced and developed within these

programmes consequently combine the professional and strategic, the personal and the academic, something that distinguishes them from the PhD.

Research councils and institutions need to make explicitly clear what the purposes of different types of doctorates are, including PhDs. Prospective candidates for any programme need to have access to information that indicates the aims of the educational process, the experience itself, and the personal learning objectives for the individual. By making these explicitly available, the quality of candidates may be maintained, as the purposes and experiences are made clear to them at the outset.

Academic Implications and Outcomes

Individuals clearly had different aims for undertaking doctorates that affected their choice of programme and the resources and experiences required. In view of these differences, how can parity of standards be ensured ? This may however, be an issue of quality, more than standards. If 'fitness for purpose' is one notion of quality, the candidates' purposes clearly have to feature prominently in deciding what a programme is fit for. Traditionally the PhD offered the only doctoral opportunity. Now with the emergence of professional and practice-based doctorates, fitness for purpose is a real issue. Explicitly stating what the qualitative purposes are, should lead to a clarification of distinctions between different types of doctorates. National frameworks for education go some way to highlighting the differences between levels of awards, but they do not tease out the qualitative nature of the differences. In part, this approach to quality relates back to Lindsay's concept of 'production-measurement', discussed on pages 44, 45 and 46 (1992, p154) . What is necessary to complement this perspective is what he termed a 'stakeholder-perspective' approach to quality. The evolution of doctoral education needs to adopt this perspective and involve all interested parties in the decision making processes. This research has contributed by focusing on views of candidates, but further questions need to be raised involving other interested parties about the overall purposes of programmes, the nature of what is produced and the resources required to achieve the aims.

Doctoral programmes are largely designed and defined by academics rooted in academic tradition. With the introduction of professional doctorates, many candidates are not seeking an academic position as a direct result of their doctorate. Clearly a structured learning experience is still required but without the assumption of an academic apprenticeship being built into it. This concept of a doctorate as an academic 'training' is certainly one that professional doctorates are shying away from. However, 'research' should still be at the core of these doctorates but the nature of this theory and activity may be considerably different. These programmes should be seen as recognising and embedding research and high level learning within broader professional contexts than academia. It is vital that research councils regard professional doctorates as being 'equal in rigor but different in substance' (Mayhew and Ford 1974, p163), but for this to be the case, the qualitative and not just structural differences between these types of doctorates and the PhD must be teased out, not least by academics themselves. This needs to be firmly identified and embedded within the candidates' experience, because it will be this, that will influence the choice to pursue that particular programme. The differences that have already been identified clearly have implications for staff development for those involved on different types of doctorates. The variety of motives that candidates have and the broad, experiential backgrounds that they come from, may mean that professional doctorates in particular, should re-negotiate the notion of 'expert' supervisor. A much more egalitarian approach must be adopted, something that may also be applicable to PhD candidates. Those responsible for delivering, assessing and advising, consequently need to be fully aware of the ethos of the doctorate and how this is integral to the implementation. Doctorates need to become more responsive rather than prescriptive, a principle that the DProf is starting to adopt. However, this means starting with a premise of valuing the candidates, believing in their capabilities and listening to their needs. To some extent, the very existence of professional doctorates indicates that this is already occurring, but how responsive the actual experience is, needs attention. Views of students and institutions have traditionally been bi-polarised and a marriage of needs is essential for doctorates to evolve in a responsive manner.

One way of achieving this would be to have doctoral monitoring and evaluation committees with candidate representatives on the panel. This would explicitly include and value candidates in the formative evolution of doctorates, and would provide the opportunity for their needs to be addressed. The DProf has begun to adopt this ethos by including candidate representatives on the Board of Studies. This inclusive approach of the evaluation, not assessment of programmes could be a generalisable principle.

Another major outcome that institutions will need to address is the value that candidates attribute to the different ways of working during a doctorate. While variations were found between candidates from different subject areas, considerable strength of opinion was expressed for both independent and collaborative opportunities. Graduate Schools offer the opportunity to develop skills associated with different ways of working. However, these should not just be implemented as an administrative exercise, organised purely for protocol reasons, but should be for the active pursuit and instrumentation of a critical community. Models exist of Schools on both an institutional and departmental level, but there are very clear advantages to a pan-institutional approach. It offers the potential for developing truly interdisciplinary theories and practice, and for broadening knowledge as well as deepening doctoral candidates' understanding. Where professional doctorates as well as PhDs exist, integrating these students adds a new dimension to their experience. For young PhD students, interacting with senior professionals with work-related knowledge and experience, may get them to see the transferability of their skills and abilities, something that appeared lacking from the findings in Chapter 7. To have an environment where formative interaction is on-going and implicit throughout the doctoral experience, may provide a more constructive, critical community than structured intervention, especially for candidates in the social sciences.

Work Based Learning Outcomes

Significant outcomes arise from this research for the operation of work based learning within Middlesex University, how it is conducted and regarded in other

institutions and indeed, the relationship of work based learning to the development of graduate education in general.

The introduction of a doctorate that was decisively and explicitly not a PhD but of equal stature, that had work based learning as its major ethos and driver, and that was an institutional initiative, arguably resulted in more scrutiny and rigor being paid to the inception and indeed on-going evolution of the programme than if it had been introduced on a departmental or School level. By using work based learning to orchestrate this initiative, which is inherently multi and inter-disciplinary, the programme had to be established pan-institutionally. This attention and scrutiny has meant that the qualitative and substantive differences of this programme as compared with the PhD have been examined. The DProf is therefore well situated to inform the evolution of other professional doctorates, that perhaps have not felt the necessity, or had the opportunity to address such issues. Indeed more thorough interrogation has probably been paid to this doctorate than is normally applied to the PhD. Coupled with the continuous emergence of other professional doctorates, a re-examination of the PhD may arise, and the work done within the confines of this initiative and indeed within this piece of research, would be well placed to inform that process. This research clearly played, and must continue to play a pivotal role in adding depth and breadth to the design and delivery of the programme. The very nature of this examination and indeed the work that candidates themselves will engage in, should begin to establish research on graduate education as a distinctive feature of the Middlesex profile. This research exemplifies the need to integrate teaching and research, the latter of which is fundamental for the longevity of work based learning itself.

Methodological Outcomes

The methodology of this research has been important, both in terms of adding a theoretical and conceptual dimension and in operationalising the research process. The significance for both theory and practice, has been in the architectural arrangement. This research has not simply pooled a series of different approaches, but has carefully selected particular elements that together provide structure and

strategy throughout the research process. The action of explicitly bringing together different methodologies and different means of data collection and analysis, has given a holistic, coherent and thematic feel to the entire experience.

The ethnographic aspect throughout this work has played a critical role and has represented the core of the methodological arrangement. This has significantly affected both the operational and ideological exploration of the research. My observation and participation in the design and delivery of the DProf, has provided new perspectives not obtainable by other means. Discussions with the range of candidates from different programmes has informed and reformed my thinking, and also affected my practice as a researcher.

The value gained from this combined approach naturally leads to a recommendation that others adopt creativity when selecting and arranging methodology. To think of it as a unitary and static entity, and to take an 'off the shelf' approach, de-values the purpose. Research is an explicitly formative process, a concept that should equally apply to the methodological dimension of that work. It should be regarded as fluid and adaptable, depending on the application. The research context, and particular needs of the project must be at the forefront of this decision making process. Providing that a sound understanding of both the theoretical and practical underpinnings of methodology is held, the freedom to customise should be encouraged. Methodology exists largely for the users' benefit, to help give theoretical depth to the research process and findings obtained, and to offer and organise strategies of obtaining data. It should be used to enhance practice, and to add value to the process of research. Doctoral research has the potential to make profound methodological contributions, and all candidates should be encouraged to do so. Those involved in professional doctorates may be in a position to offer new insights into the understanding and application of methodology. The different aims of these programmes and more applied nature of the projects, could shed new light on how methodology is perceived and employed. The concept of using multiple methodologies within an architectural framework, lends itself particularly well to complex, large-scale research. Doctoral level projects are inherently complex, and

those conducted on professional doctorates may be further complicated by the professional context in which they are being undertaken. This kind of methodological approach may be particularly appropriate where the interrelated and intricate organisational setting needs to be reflected.

Personal Outcomes

As a result of the role of the researcher being so inextricably tied to the focus of this research, many of the principles learnt and acquired throughout the course of the work have been internalised. For example, the notion of valuing candidates' perspectives, needs and requirements were adopted both in relation to how I viewed my own practices as a research student, and also how I regarded the perceptions of candidates on the DProf. This understanding can be taken forward within post-doctoral researching and teaching roles.

Recommendations and Suggestions for Further Work

Research into the changing nature of doctorates in Britain is embryonic and enormous scope exists for further exploration. Below are suggestions for important areas of future work, followed by a synopsis of the key recommendations of this research.

A clear need exists to continue 'enriching the picture' of perspectives on doctorates. While this research has provided a snapshot, largely of the candidates' views and doctoral requirements, a detailed analysis of other stakeholders is crucial. Understanding employers' perceptions is clearly an area of deficiency and should therefore be the highest priority. The 'employability' and recruitment trends of doctoral graduates have not traditionally been a major concern, and employers have not traditionally been involved in shaping doctoral provision. This neglect means that employers' opinions of different types of doctorates, their needs from graduate education and their views of doctoral capability, are largely unknown. The contribution that doctoral education will make to economic imperatives of embedding high level learning throughout society, is clearly an agenda for academics, employers and policy-makers to address.

Opportunity exists for follow-up work to be done that critically appraises and evaluates the processes and products of the DProf and particularly the criteria of assessment. Potentially these could provide the basis for generic characteristics of doctoral capability, applicable to all doctoral programmes. They could also offer a platform on which to discuss those features that should be context or subject specific to particular doctorates. This process of investigation should build on the work already achieved and continue to probe the perceptions of other key interested parties. The establishment of both generic and specific capabilities could provide a starting point from which concerns about parity of standards could be alleviated.

The 'rich picture' obtained through this work would be enhanced by a broader investigation. The interviews, sample sizes and case studies used in this piece of research were relatively small scale, and a more uniform and extensive approach would provide a wider perspective to complement this more focused exploration.

Recommendations:

Policy

- QAA should consider creating a framework of postgraduate awards that defines core characteristics of 'doctorateness' and reflects the individual needs (both personal and professional) of the candidate.

- Research councils should begin to address and recognise professional doctorates as contributing a qualitatively different nature of research to the national research profile. The RAE should also have a broad enough remit to acknowledge this. Equally those responsible for the design and conduct of professional doctorates need to be conscious of this fact and encourage candidates to disseminate the research, both within traditional academic circles and within professionally specific forums. This presupposes that professional doctorates are clear about their particular ethos and distinctive aims, and this is something that designers of such programmes need to address.

Research Practice

- The role of Graduate Schools on a pan-institutional basis which incorporate professional doctorate students and PhDs should be examined. Institutions should also consider defining skills and training that are generic to all doctoral candidates.

- A monitoring system that shows progress against students' own goals should be considered, so that the outcomes are more closely tied to the students' own motivational requirements.

Further Research

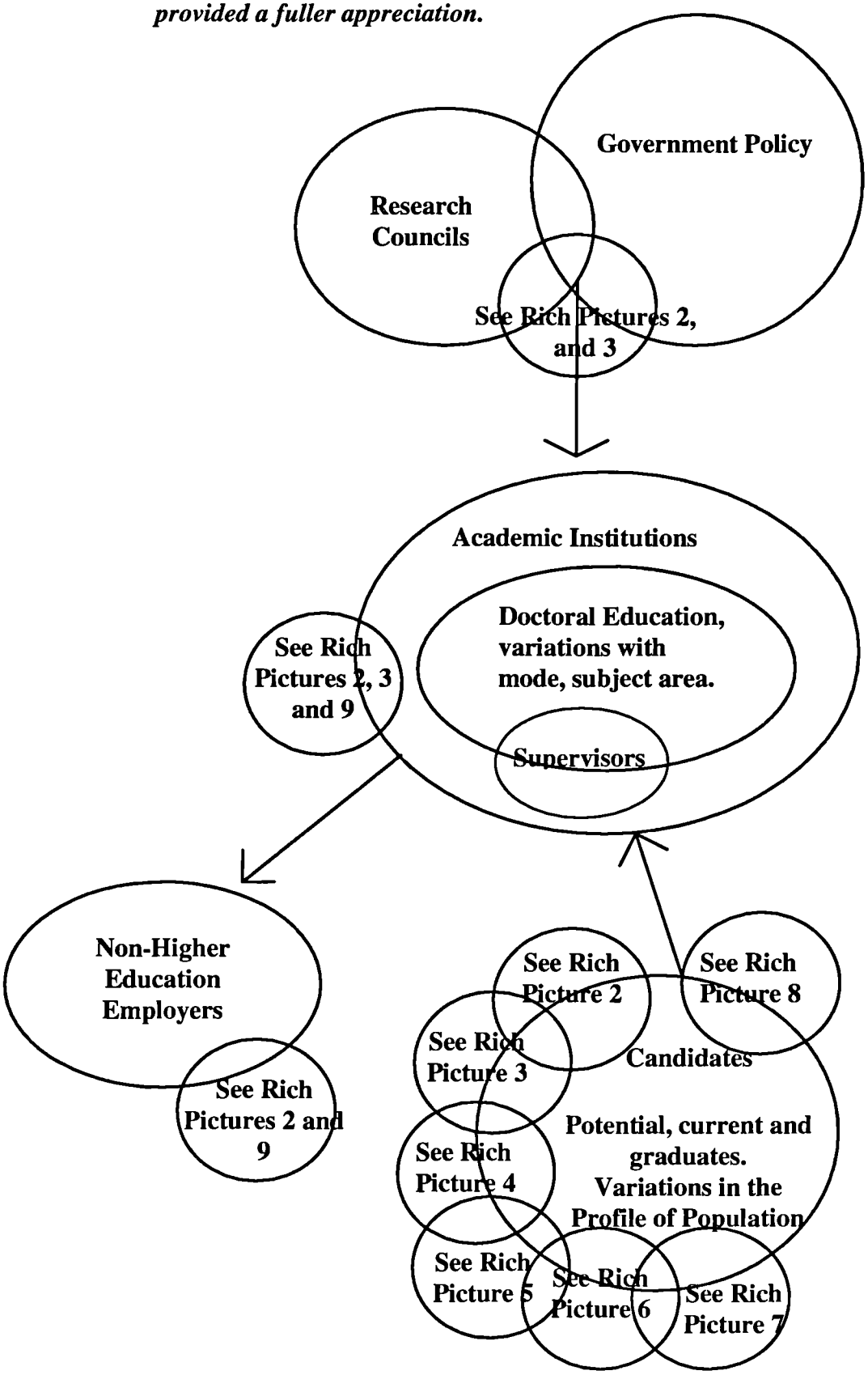
- An exploration of employers' perceptions of current doctoral provision (including their knowledge and views of professional doctorates), their needs and expectations from doctorates and doctoral candidates, and their opinions of how doctoral education could be made more responsive to their requirements should be undertaken.

- An examination of the concept of doctoral capability that involves all interested parties should be undertaken. The identification of generic characteristics, as well as those that should be subject or professionally specific, could help us to clarify the distinctions between professional doctorates and PhDs, referred to in the first recommendation above.

- The evolution of the DProf should be underpinned by on-going research to provide contextual breadth as well as depth to the programme. The programme should be operationalised within other Schools at Middlesex University, in order that the distinctive ethos and contribution of this professional doctorate is extended to all professional areas.

Rich Picture 10: Adding to the Picture of Doctorates

The contribution made to the picture of doctorates centres around understanding the candidates' perspectives. However, knowledge of other stakeholders' views and needs has provided a fuller appreciation.



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Appendices

1 Student Questionnaire

2 Graduate Questionnaire

Disk 1: Graduates' Results in Microsoft Word version 6.1

Disk 2: Students' Results: Volume 1 in Microsoft Word version 6.1

Disk 3: Students' Results: Volume 2 in Microsoft Word version 6.1

Appendix 1

Questionnaire on Doctorates **Doctoral Students**

Thank you very much for completing this questionnaire. Your responses will be most useful during the process of my PhD. The material that you have provided me with will be treated in confidence and anonymity will be preserved.

---

1. Your Doctoral Details **Please tick the boxes**

Name .....

Contact Details Address/telephone number/email address

.....

.....

What type of doctorate are you currently undertaking ?

M/Phil/PhD	[ ]	Other please specify and describe
EdD	[ ]	
EngD	[ ]	
DBA	[ ]	

What institution are you registered at ? .....

What is the subject area of your doctorate ?

Arts/Humanities	[ ]	Other please specify and describe
Social Sciences	[ ]	
Education	[ ]	
Technology	[ ]	
Engineering	[ ]	
Business/Management	[ ]	
Science	[ ]	

What is your current mode of study ?

Full-time	[ ]
Part-time	[ ]
Distance learning full-time	[ ]
Distance learning part-time	[ ]

What year of your doctoral programme are you currently in ? .....

What is your source of finance ?

Self-financed	[ ]	Other please specify and describe
Research Council Bursary	[ ]	
Institutional Bursary	[ ]	
Employer financed	[ ]	

Are you aged:

Under 25	[ ]
25 - 30	[ ]
31 - 40	[ ]
41 - 60	[ ]
61 +	[ ]

---

2. Purpose **<Not important** **Quite important** **Extremely important>**

How important were the following factors on your decision to begin a doctorate ?
please answer all options

	1	2	3	4	5	6
Availability of funding	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Personal development	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Gaining academic prestige	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Development of research skills	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Development of specialist knowledge	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Making a major contribution to the field	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Enhancing career prospects within academia	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Enhancing career prospects outside academia	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Other please specify.....	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Appendix 1

3. Definition <Not important Quite important Extremely important>

How important are the following definitions to your conception of a doctorate ?

please answer all options

	1	2	3	4	5	6
A significant contribution to knowledge	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
An academic apprenticeship	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
A training in research techniques	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The initiation of a career	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The culmination of lifetimes work	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The ability to work at a distinctive level	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The ability to teach	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The ability to work autonomously	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The ability to work collaboratively	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Other please specify.....	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

4 . Resources and Experience <Not important Quite important Extremely important>

In your opinion how important are these resources during a doctorate ?

please answer all options

	1	2	3	4	5	6
Access to a library	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Regular supervision	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Computing facilities	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Subject specialist equipment	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Research expenses	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Conference access	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Peer support	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Academic environment	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Teaching opportunities	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Additional study outside the research programme	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Personal skills development	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Appraisal	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Work experience	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Business/enterprise training	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Other please specify.....	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

From your own doctoral experiences, did any of these resources not meet your requirements ?

Please specify and describe.....

.....

5. Distinctiveness

As opposed to a BA/Sc or MA/Sc graduate what characterises a doctoral graduate or 'doctorateness' ?

Please attach any additional responses on a separate sheet.

6. Ways of Working <Not important Quite important Extremely important>

In your opinion how important do you think these different ways of working should be to doctoral study ?

please answer all options

	1	2	3	4	5	6
Working independently	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Joint working with other researchers	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Collaborating with other colleagues	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

From your own doctoral experiences, how central was collaboration to your work ?

Please specify and describe.....

.....

Thank you for your time - please return your completed responses to: Lucy Thorne, National Centre for Work Based Learning Partnerships, Middlesex University, White Hart Lane, London. N17 8HR, or to L.Thorne@mdx.ac.uk if you received the questionnaire by email.

Appendix 2

Questionnaire on Doctorates **Doctoral Graduates**

Thank you very much for completing this questionnaire. Your responses will be most useful during the process of my PhD. The material that you have provided me with will be treated in confidence and anonymity will be preserved.

---

1. Your Doctoral Details **Please tick the boxes**

Name .....

Contact details Address/telephone number/email address

.....

What type of doctorate did you undertake ?

MPhil/PhD	[ ]	Other please specify and describe
EdD	[ ]	
EngD	[ ]	
DBA	[ ]	

What institution were you registered at ? .....

What was the subject area of your doctorate ?

Arts/Humanities	[ ]	Other please specify and describe
Social Sciences	[ ]	
Education	[ ]	
Technology	[ ]	
Engineering	[ ]	
Business/Management	[ ]	
Science	[ ]	

What was your mode of study ?

Full-time	[ ]
Part-time	[ ]
Distance learning full-time	[ ]
Distance learning part-time	[ ]

What was your source of finance ?

Self-financed	[ ]	Other please specify and describe
Research Council Bursary	[ ]	
Institutional Bursary	[ ]	
Employer financed	[ ]	

What was your age on completion of your doctorate ?

Under 25	[ ]
25 - 30	[ ]
31 - 40	[ ]
41 - 60	[ ]
61 +	[ ]

---

2. Your employment details

If you are currently employed, What is your job title ?

.....

Did your job description specifically ask for a doctoral graduate ? Yes [ ] No [ ]

With your permission could I contact your employer to obtain information about doctoral recruitment ? Yes [ ] No [ ]

---

3. Purpose **<Not important Quite important Extremely important>**

How important were the following factors on your decision to begin a doctorate ? **please answer all options**

	1	2	3	4	5	6
Availability of funding	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Personal development	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Gaining academic prestige	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Development of research skills	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Development of specialist knowledge	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Making a major contribution to the field	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Enhancing career prospects within academia	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Enhancing career prospects outside academia	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Other please specify.....	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Appendix 2

4. Definition <Not important — Quite important — Extremely important>

How important are the following definitions to your conception of a doctorate ? please answer all options

	1	2	3	4	5	6
A significant contribution to knowledge	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
An academic apprenticeship	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
A training in research techniques	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The initiation of a career	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The culmination of lifetimes work	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The ability to work at a distinctive level	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The ability to teach	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The ability to work autonomously	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The ability to work collaboratively	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Other please specify.....	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

5. Resources and Experience <Not important — Quite important — Extremely important>

In your opinion how important are these resources during a doctorate ? please answer all options

	1	2	3	4	5	6
Access to a library	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Regular supervision	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Computing facilities	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Subject specialist equipment	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Research expenses	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Conference access	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Peer support	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Academic environment	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Teaching opportunities	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Additional study outside the research programme	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Personal skills development	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Appraisal	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Work experience	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Business/enterprise training	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Other please specify.....	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

From your own doctoral experiences, did any of these resources not meet your requirements ?
Please specify and describe.....
.....

6. Distinctiveness:

As opposed to a BA/Sc or MA/Sc graduate what characterises a doctoral graduate or 'doctorateness' ?

Please attach any additional responses on a separate sheet.

7. Ways of Working <Not important — Quite important — Extremely important>

In your opinion how important do you think these different ways of working should be to doctoral study ? please answer all options

	1	2	3	4	5	6
Working independently	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Joint working with other researchers	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Collaborating with other colleagues	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

From your own doctoral experiences, how central was collaboration to your work ?
Please specify and describe.....
.....

Thank you for your time - please return your completed responses to: Lucy Thorne, National Centre for Work Based Learning Partnerships, Middlesex University, White Hart Lane, London. N17 8HR, or to L.Thorne@mdx.ac.uk if you received the questionnaire by email.