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**An Exploration of the Relationship between Undergraduate
Pharmacy Knowledge and Professional Practice**

Jonathan Stephen Waterfield

A dissertation submitted in partial fulfilment of the requirements of Sheffield Hallam
University for the Degree of Doctor of Education

January, 2014

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ABSTRACT

Pharmacy education is undergoing a transition as the pharmacy profession aspires to a more clinical role. The two main areas of study within the undergraduate curriculum are pharmaceutical science and pharmacy 'practice'. 'Practice' includes subjects that relate directly to the practice of pharmacy such as: dispensing, pharmacy law, ethics and communication skills. In recent years the 'practice' content of the undergraduate curriculum for the Master of Pharmacy (MPharm) programme has increased in comparison to the traditional emphasis on pharmaceutical science. The thesis examines the tension between pharmaceutical science and pharmacy 'practice' framed by a discussion of the perspectives of Schön, Bourdieu and Bernstein.

A mixed methods approach included a questionnaire study of the views of academic members of staff across 12 Schools of Pharmacy (SOP). The questionnaire was followed by 12 semi-structured interviews with respondents representing three different types of SOP. The data collection was undertaken in conjunction with the ongoing writing of a reflexive diary to summarise emerging themes. The research design is based on a narrative, reflexive approach where I recognise my personal history in relation to the interface between knowledge and professional practice.

Overall the questionnaire results from nearly 200 respondents portray the MPharm curriculum as an educational rather than a training programme where there is the integration of science and 'practice' and the opportunity to apply knowledge. Key findings from the interviews indicate a polarisation between the views of pharmaceutical scientists and pharmacy practitioners regarding what constitutes pharmacy knowledge. There is a general lack of clarity about the professional role of the pharmacist. My research shows that whilst an appeal to scientific identity strengthens the claim for professional status there is also some uncertainty about the scientific identity of the pharmacist particularly in the new SOP.

The findings show that the move towards an integration of science and 'practice' is a challenging ideal as the scientific subject specialist and pharmacy practitioner occupy different spaces within the pharmacy education field. Acknowledgement of the social basis of knowledge can support our understanding of the multidisciplinary MPharm curriculum. Overall, this research draws attention to the need for a more open discussion of the epistemology of pharmacy practice within the academic community.

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CHAPTER 1: INTRODUCTION TO PHARMACY EDUCATION

This chapter provides an outline of the overall aim of the research, why I consider this work to be important and an overview of some key background issues that inform the research area. A narrative approach has been taken to this work and I justify this by an explanation that links this approach to reflexivity and my claims to validity. The chapter concludes with a discussion of my personal journey into reflexivity and a summary of my personal constructs within this field of study.

Overall aim of the research

The overall aim of this study was to explore how pharmacy knowledge within the Master of Pharmacy (MPharm) undergraduate curriculum relates to future professional practice. This study has focused on three key areas:

- the distinction between pharmaceutical science and professional practice areas of the curriculum and how this issue is viewed
- the different views of pharmacy educators on the preparation of the future practitioner for professional practice
- the ongoing education versus training debate within a vocational pharmacy education programme

My formative consideration of these areas and initial consideration of the literature resulted in the publication of two papers:

- '*Two approaches to vocational education and training. A view from pharmacy education*' (Waterfield, 2011) which concluded that the

ongoing move towards a more practice-based curriculum needs opening up to a much wider discussion than is currently evident in the literature.

- *'Is pharmacy a knowledge-based profession?' (Waterfield, 2010)* which framed a theoretical question about the nature of knowledge and professionalism and how this relates to the pharmacy profession.

There is a statement of the specific research questions at the end of the literature review in Chapter 2.

What is the focus for this research?

It is useful at the outset to distinguish between 'pharmaceutical science' and 'pharmacy practice' as the two main areas of study within the MPharm curriculum. Typically pharmaceutical science includes subjects such as chemistry, pharmacology and pharmaceutics. Pharmacy 'practice' includes subjects that relate directly to the practice of pharmacy such as: dispensing, pharmacy law, ethics and communication skills. Scientists have their own practice and this is often overlooked in pharmacy education where there is a dichotomous reference to 'science' or 'practice'. One key area of debate identified in the relationship between theoretical knowledge, education and professionalism is the lack of integration between pharmaceutical science and pharmacy practice. In his book *'Researching Higher Education'*, Tight states that knowledge is in many ways the most fundamental and the most theorized area within higher education, but the least researched (Tight, 2003). The focus for this research is undergraduate pharmacy education from the viewpoint of the pharmacy educator.

Why is this work important?

Pharmacists have a certain moral responsibility as they are the gatekeepers to safe drug usage and are required to use their knowledge responsibly within the healthcare system. It can be argued that because the knowledge and work of the pharmacist relates to medicine, the profession has the potential to make a massive impact on society. The converse view suggests that the failure of pharmacists to gain control over the 'social object' of medicine by their subordinate relationship with the medical profession and their close association with a supply function, has reduced their usefulness and status as a profession. Somewhere in the middle of these two extremes the pharmacist is situated in a knowledge-based role but is constrained by an ambiguous professional identity.

There are three main reasons why I view this work as important. Firstly, an insight into the views of pharmacy educators offers a unique window on the world of pharmacy as it provides material from people across a range of disciplines that span professional practice and pharmaceutical sciences. Secondly, this rich data source could potentially offer a significant contribution to the debate about the nature of the pharmacy profession, pharmacy knowledge and the position of pharmacy practice within the MPharm curriculum. Finally it is possible that this research may develop a transformative agenda as the work may ultimately contribute to our understanding and development of the pharmacy curriculum. This in turn may influence the evolving role of the pharmacist and ultimately may impact on the quality of patient care.

Background to the research area

A research project commissioned by the Royal Pharmaceutical Society of Great Britain (RPSGB) and undertaken by Wright et al. (2006) compared pharmacy with other healthcare professional education and training. The report concluded that pharmacy education in the UK in comparison with other UK health disciplines and with pharmacy education in comparable other countries is treated as a science degree rather than a clinical qualification. This identity as a science degree is almost like a 'hangover effect' from the way that pharmacy has evolved from its historic scientific roots into a more clinically orientated profession.

In recent years the aspiration for a more clinical profession has resulted in a move to increase the amount of 'pharmacy practice' teaching both within the Schools of Pharmacy and also within pharmacy practice settings. There has also been a considerable expansion of the number of Schools of Pharmacy in the UK. The number of Schools of Pharmacy in England increased from 12 to 21, between 1999 and 2009 and the number of students more than doubled from 4200 to 9800 (MEE, 2011). This expansion in pharmacy education and increasing emphasis on clinical curriculum content provides a dynamic research field that is ripe for further exploration.

On a purely practical level, the lack of recognition as a clinical qualification highlighted by Wright and his colleagues, as opposed to a clearer emphasis on a scientific course of study, has implications in terms of funding clinical placements. At a more theoretical level, the current increase in the pharmacy practice components (compared to the pharmaceutical science components) of

the curriculum has resulted in significant questions of debate amongst various stakeholders, such as:

- What is the nature of pharmacy practice and how can future practitioners be most effectively prepared for their role?
- Is there a danger that the scientific identity of the pharmacist is compromised as scientific components of the pharmacy degree programme are marginalised?
- Is the MPharm degree programme seen as competence-based training for future practice or a more holistic education?

These questions offer a potentially rich source of discussion, within a profession that is undergoing enormous change. The language used in the government paper: *'Pharmacy in England – building on strengths, delivering the future'*, indicates a strong support for the *"untapped expertise and capacity"* of the pharmacy profession and the preparation of future practitioners for a more clinical role (DOH, 2008 p86). It is clear from the General Pharmaceutical Council (GPhC) publication of the standards for the initial education and training of pharmacists (GPhC, 2011) that the regulatory body are looking for a more competence-based approach to the delivery and assessment of the MPharm degree. However, it is less clear how foundation pharmaceutical sciences are both included and integrated within the new curriculum. The position of pharmaceutical science and the relationship to professional practice is a debate that is beginning to gather momentum and is an active area of discussion within pharmacy education circles.

In 1997 there was a significant change in pharmacy education as the pharmacy degree course moved from the three year BPharm or BSc programme to the four year MPharm programme. Under the Bologna agreement for educational equivalence across Europe, this four year programme is classified as an 'undergraduate Masters programme' which is a lesser qualification than the traditional MSc degree (Chamberlain, 2005). The UK four year degree is the shortest of the European pharmacy degrees, as typical pharmacy degrees within mainland Europe are five to six years. However, the European Union Directive on the education and training of pharmacists was not the only driver for the move to a longer pharmacy degree course. A report from an education working group of the RPSGB (2002) cited a number of other reasons for the change to a four year degree which are summarised below:

- Compensation for a reduced breadth of science curriculum within secondary education
- To address advances in biological and chemical sciences in sufficient depth to be able to understand new approaches to drug therapy
- To incorporate a grounding in social and behavioural sciences to meet the needs of patients and other healthcare professionals as highlighted in the Nuffield Report (Nuffield, 1986)

It is significant to note that two of the drivers for an expanded pharmacy degree programme related to the increased science content of the curriculum. This aspiration to increase scientific content appears to contrast with the current trend, which is an increase in practice-based teaching.

There has been some discussion about the move from a three year to a four year programme and the use of the term 'Integrated Masters' to describe study at both undergraduate and Master's levels. One study, comparing the "*rhetoric and reality*" of the expanded degree programme, involved interviewing 10 pharmacy course leaders and concluded that the change from BPharm to MPharm was led by "*contention and insecurity rather than debate*" (Sie et al., 2003 p169). Their study suggests that as Schools of Pharmacy have redesigned their curriculum there is a lack of homogeneity between programmes. The 26 Schools of Pharmacy in the UK are required to adhere to the indicative syllabus and education standards of the GPhC regulatory body. However, within these constraints all Schools have different approaches to the delivery of the MPharm curriculum. For example, different course providers will vary in the proportion of pharmaceutical science, pharmacy practice and placement-based learning within the curriculum according to their own interests, expertise and ethos. This lack of uniformity of content is not confined to pharmacy programmes in the UK. For example a comparison of pharmacy education programmes in New Zealand and the United States demonstrated that whilst there has been some consensus of opinion about what knowledge, skills and attributes a modern pharmacy graduate should possess, the content and emphasis of different programmes differs widely (Shaw, 2002).

The question this research project centres on is the nature of the relationship and interface between education and professional practice, which is a significant and dynamic area of discussion, relating to knowledge and professional practice.

An ongoing challenge for the pharmacy profession is to produce practitioners who are both scientists and healthcare professionals. There has been a decline in the number of academic, science-based pharmacists (Taylor and Harding, 2002) coupled with a rise in the number of undergraduate pharmacy students. This trend of a reduction in academic pharmacists who are responsible for greater numbers of future pharmacists has implications for the development of the pharmacy profession. Potentially this situation could lead to a shortfall in the area of professional knowledge. At the time of writing there are significant moves to modernise the education and training of future pharmacists, by the Modernising Pharmacy Careers Programme Board (MPCPB). This board is part of Medical Education England (MEE), which is an independent advisory body established to advise ministers on education, training and workforce planning for doctors, dentists, healthcare scientists and pharmacists. The MEE programme was set up following the publication of the government paper '*A High Quality Workforce: NHS Next Stage Review*' (Darzi, 2008). Part of the work undertaken by the MPCPB was a comprehensive review by the University of London Institute of Education, which identified a number of weaknesses in current arrangements for the delivery of undergraduate and pre-registration training of pharmacists. The four main areas of weakness identified are:

- Students have very little exposure to patients and learning in a clinical environment
- Quality assurance across the pre-registration year is variable and not a responsibility of the Schools of Pharmacy
- Students have a strong science education and training, but they have difficulty in applying the science into clinical practice to benefit patients
- The application of communication skills to practice scenarios

The MPCPB proposes major restructuring and funding of pharmacy education “to allow patients, the public and the NHS to benefit more completely from the unique contribution that pharmacists – as medicine experts – make to health, wellbeing and patient safety” (MEE, 2011). At the same time the regulatory body have developed a set of new education standards that utilise a more competence-based approach (GPhC, 2011). Overall pharmacy education portrays a dynamic research field that offers an opportunity to explore the relationship between theory and practice in an evolving healthcare profession.

A narrative approach to research

In this section I justify my narrative approach to the exploration of this area, the relationship to Bourdieu’s concept of reflexivity and how this links to my claims to validity. A full explanation of my research design is provided in Chapter 3 which follows on from a review of the literature in Chapter 2.

Polkinghorne (1995 p5) describes narrative enquiry as a “*subset of qualitative research designs in which stories are used to describe human action*”. For this research the main way I use a narrative approach is the utilisation of a reflexive diary as one of my research instruments to facilitate the construction of reflexive summary accounts. From a pragmatic viewpoint this is a way of trying to bring a sense of order into the thematic analysis of interview narratives and ongoing reflection on the theory-practice dichotomy within pharmacy education. There are three basic claims within the narrative research literature summarised by Moen(2008 p60) that I have applied to this investigation.

- Human beings organise their experience of the world into narratives

- Stories told depend on a number of factors such as the individual's past and present experience, his/her values, the audience listening to the narrative and when and where the narrative is being heard
- Narratives are multi-voiced as they are an interaction between beliefs and experiences and present and future external voices

These three claims can be related to my own approach to research and my claims to validity. Firstly the knowledge that individuals use a narrative framework to explain their experience of the world is fundamental to a study that engages with the individual academic viewpoint. It has been important to tune into these individual narratives and through this activity look for my own narrative as a way of bringing structure into my understanding of the theory-practice question within pharmacy education. Secondly, the position of the individual and his/her relationship to the listener will clearly impact on the narrative and I have taken this into account when analysing the interview narratives. Thirdly I recognise the multi-voiced nature of narrative in the construction of my own reflexive summary accounts. The research project has encouraged me to examine my own reflexive personal journey and to summarise my personal constructs.

The overriding research questions guide the entire investigation and have arisen from my personal experience and disposition. For example one of the research questions asks: what areas of pharmacy knowledge are viewed as important by pharmacy educators? This question stems directly from my observation of how different educators view their own discipline in relation to practice within a vocational field. Throughout the research a reflexive process

has added strength to the investigation as this iterative process continually scans for an internal disposition and how this is linked to my own experience.

Moen (2008) describes narrative as an understanding of how human actions are related to the social context in which they occur. I find this definition helps to frame my work as it develops the concept of narrative from a purely descriptive account to a method of relating a narrative to the social world of pharmacy education. A narrative approach has supported the use of a reflexive process throughout the entire research project.

Developing a reflexive approach

Reflexivity is a term that is used in many different ways in the literature and reflexivity and reflection are often used interchangeably (D’Cruz et al., 2007). For the purposes of this research I have focused on the use of this term in ethnomethodology where it is claimed that the social order is not imposed from the outside but is created by people using their reflection on and interaction within the social world. I view reflexivity as a step beyond simply looking back in a reflective way. Reflexivity involves the interaction of individual reflection with theoretical perspectives and the unique experience of the individual within the field. In a research setting this approach acknowledges that the researcher is an integral part of the world that they study. Traditionally researchers may have tried to hide or ignore the effects of the researcher, whereas a more transparent acknowledgement of the reflexive researcher may reap greater benefits. This methodological concept has consequences at a practical level. For example, the use of interviews as described by Schuman (1982) in a comparison of reflexive and non-reflexive survey methods states that a simple approach to

survey takes responses literally, ignores the interviewer as a source of influence and treats sampling as unproblematic. This is contrasted with a survey that treats research as a search for meaning, ambiguities and discrepancies and these make up an important part of the data rather than being ignored or regarded as obstacles.

Relationship to Bourdieu's concept of reflexivity

The Bourdieusian influence on my review of the literature and a definition of key terms are described in Chapter 2 where I have drawn on field theory to describe some of the tensions within pharmacy education. It is important at the outset to highlight that Bourdieu's concept of reflexivity has been applied to the narrative approach to my research. From a personal perspective I found the final part of Bourdieu's '*Science of Science and Reflexivity*' (Bourdieu, 2004) the most powerful as he starts to unpack his personal life journey in relation to his theory. This work is expanded in '*Sketch for a Self Analysis*' (Bourdieu, 2007) where he recounts and analyses life experiences in relation to his theoretical journey. At the outset Bourdieu states that "*this is not an autobiography*" having been critical of the narcissism that can result from looking back at an individual life. The account offers a refreshing way of objectivating by making him the object. The key characteristics evident are the way that Bourdieu breaks with the structuralist paradigm by focusing more on individual habitus of the socialised agent rather than a structural system. Bourdieu speaks of "*objectivating the subject of objectivation*" (Bourdieu, 2004 p95) and makes it clear that a point of view is taken from a particular point or social space and that the objectivating point of view is that point. The incidents portrayed in his life story demonstrate clearly that our perceptions, visions, beliefs and expectations are all socially

structured. The illusion that there is one point of view is systematically eroded as the correspondence between positions and position takings is demonstrated. Bourdieu's work in this area has helped to shape my thinking about the objectivity-subjectivity debate and identity within the polarised pharmacy education field. This area is discussed more fully in an explanation of my research design in Chapter 3. An important part of my claim to validity is the recognition of myself in the research process. In the application of a narrative approach to the research of my own profession I acknowledge my own set of dispositions. Drawing out my habitus is important in the process of objectivating the subject of objectivation. In the adoption of a narrative approach and how this relates to Bourdieu's concept of reflexivity I have been mindful of the following:

- The critical balance between personal experience (autobiographical influences) and theoretical perspectives
- The recognition of myself and others as socialised agents within the field of pharmacy education rather than an emphasis on pharmacy education structures
- A sense that my point of view will be shared by others who have a similar habitus

Personal journey into reflexivity

I find reflexivity a challenging concept as this process involves the move from the comfortable detached zone into an examination of the layers of my own background. As I have examined myself as an example of researcher exploring pharmacy knowledge in relation to the MPharm curriculum and professional practice, I have considered the impact of my own background. This activity transports me from the secure language of the acceptable (in scientific circles)

of the detached third person and has required a more descriptive account. My career history in community pharmacy and the practicalities of this sector would imply that I would favour a more practice-based curriculum. However, my practice experience of under-utilisation of scientific knowledge and professional domination of the medical profession has influenced my view that pharmacy is essentially a scientific profession that needs to retain its unique roots within all aspects of medicine. This empathy with the immense value of pharmaceutical scientists and the dissemination of their knowledge to future pharmacists has been tempered by my experience of practice. In the social world of patients and carers the social needs of patients are sometimes ignored and there can be an imbalance between protocol driven 'science' and the real needs of the public. Ideally I want more balance so that neither science nor practice dominates the field of pharmacy education.

Without digressing too far, a typical example would centre on repeated antibiotic prescriptions for a mother and her two young children with frequent upper respiratory tract infections. They may be repeatedly treated with the correct antibiotic and receive accurate 'evidence-based' technical advice about their medication, but their real problem is that they live in inadequate overcrowded housing that is affecting their health. As an accessible primary healthcare professional the pharmacist cannot ignore this social dimension and this typical example therefore has theoretically influenced my view on the question of relevant social pharmacy knowledge. My reflexivity has also taken into account that for a significant formative part of my working life I worked as a secondary science teacher and whilst remaining a registered pharmacist I was fully engaged in another area of work. This has influenced my views in many ways

as I have had a different external vantage point of the pharmacy profession. One of the personal views I find difficult to suppress is the lack of creativity within the profession in meeting the needs of patients. This brief excursion into reflexivity has confronted me with my own disposition that knowledge is not coherent enough on the MPharm degree programme and there is a need for greater integration and creativity.

In the next section I summarise my personal constructs and explain why I attach importance to specific points within this area of focus. I recognise that my epistemological approach involved me in constructing knowledge, so it follows that it would be logical to state my personal stance on some of the key areas that will be opened up during this investigation.

Summary of personal constructs

This study has made me more comfortable with a hermeneutic approach where I aim to interpret and construct rather than find out and make specific knowledge claims in a positivist tradition. As Gadamer states the researcher both must and should start from the viewpoint of his/her own culture and tradition (Gadamer, 1995). Hans Gadamer observes this as a hermeneutic philosopher in his book '*Truth and Method*'. He argues that prior to the application of any method there is always the operative understanding of truth (Gadamer, 1995). He develops the notion that it is the understandings of truth that produce the method, rather than methods producing truth, which is ontologically questionable. A related conclusion is that all methods including scientific methods, can only find the sorts of things they are 'tuned' for (Slife and Williams, 1995). It follows that, in social and educational research, if our

methods are not 'tuned' for human beings then the method can miss what is true and important. This highlights the epistemological problem of opening up scientific knowledge and culture, a domain that can sometimes be seen as 'cut and dried'.

According to Habermas we have allowed instrumental rationality (defined as action oriented to the achievement of efficiency in human life) to be our measure in areas of life where it is inappropriate. One of his main themes is that valid knowledge can only emerge from a situation of free and open dialogue. Whilst a critic of positivism in '*Knowledge and Human Interests*' (Habermas, 1972) he describes a theory of communicative action, where people try to influence one another by putting forward claims in an open way that can be criticised and subjected to debate. For Habermas the emphasis is on an active dialogue or argumentation moving towards a consensus.

From my viewpoint, within the area of social practice-based knowledge where objectivity (in the commonly understood scientific sense) is unobtainable I am sympathetic towards a theory of communicative action as a procedural ideal. This ideal is not fully realisable but acts as a means of regulating discourse and is a blunt approximation for objectivity within the social world. This is the main reason why I have focused on interaction with academic colleagues which involves communicative action to explore my research questions.

The dichotomy of the pharmaceutical scientist and pharmacy practitioner resonates with a discourse that highlights differences between scientific theory and everyday action and practice. It appears that neither side can enter fully

into the dialectic and my research aims to uncover this area, but before I make this step I examine my own perspectives.

My main role as lecturer in pharmacy practice in a School of Pharmacy cannot be clearly separated from my own experience as a pharmacy student, career history in pharmacy and education, my view of science or my current practice as a locum community pharmacist.

Looking back to my experience as a student I was clear that I wanted to undertake some study that would lead to direct employment within a healthcare environment. My initial impression of the pharmacy degree programme was that it was extremely scientific and covered a wide range of biological, chemical and physical sciences. Any vocational elements appeared to be marginalised and tacked on the end of the programme. It appeared that any specific training would take place during the pre-registration stage and the degree was seen as more of an academic challenge, with long contact hours and intense scientific content. This surprised me and I constantly questioned the relevance of some of the areas that were studied in relation to their usefulness in future practice. During the pre-registration training period I felt a sense of disappointment and some frustration as I perceived that the knowledge gained during the degree programme did not appear to be fully utilised. I decided to change career direction, completed a postgraduate certificate in education and started work as a secondary science teacher. Immediately I began to see that I could apply scientific knowledge and use everyday examples that would be useful in the classroom. Paradoxically I felt that I was using my pharmaceutical knowledge more as a science teacher than as a practising pharmacist. This was possibly a

naive view and several years later I started work as a pharmacist thinking that my view about pharmacy knowledge had been misjudged. However, on starting work as a pharmacist with a fresh stance in that I had several years of work experience in education I continued to feel uncomfortable that the knowledge gained during my degree and its relationship to pharmacy practice was still considerably unbalanced. Subsequently there have been some changes within both the pharmacy profession and recent changes within pharmacy education but my view is that there is insufficient dialogue in this area. My career history from this point has involved a blend of both pharmacy practice and education but it was not until the point of writing up this research that I have been able to crystallise my own views.

My guiding constructs can be summarised as:

1. Pharmacists like other healthcare professions are dominated by the medical profession and the scientific knowledge of pharmacy which is unique to the pharmacy profession can be seen or used as a source of power as the pharmacist builds his/her own professional identity. For example pharmacists continually claim that they are the 'medicines expert' and have a superior knowledge of medicines than any other healthcare professional. This does not appear to be challenged or discussed in an open forum.
(Knowledge as power)
2. The pharmacy degree course has a scientific bias which helps to maintain the power and status balance as described in (1) above but this scientific knowledge is not fully utilised within community pharmacy which is the main sector of practice. (Knowledge - locked within profession)

3. There is an overall lack of creativity in terms of linking scientific knowledge with current practice, so that the knowledge can be mobilised. The most recent education standards published by the regulatory body emphasise the importance of integration and contextualisation of pharmaceutical science and pharmacy practice. Whilst this problem has been identified there is a long journey ahead to demonstrate how knowledge can be liberated and used in practice. The profession appears to be stilted by its own history and lacking in individual identity. (Profession – lacking in identity)
4. There is a certain lack of thinking about the nature of pharmacy knowledge within the pharmacy profession and the academic community. The emphasis is on structures such as curriculum content and the measurement of outputs against prescriptive standards rather than a more holistic view of the social object of medicine and the agency of individuals. There is a predominant naive positivist culture where there is an attempt to reduce pharmacy to series of scientific rules where troublesome outliers and the many uncertainties associated with medicines are often ignored. This is linked to a lack of reflexivity and the pharmacy profession being structured rather than structuring. (Profession – strong naive positivist culture)

The above four guiding constructs enabled me to start as Gadamer (1995) describes from the viewpoint of my own culture and tradition and reach some '*fusion of horizons*' with the area under investigation. Having described the overall aim of the research and justified my narrative, reflexive approach the next chapter describes how a review of the literature has been used to develop an overall frame of reference for my investigation.

CHAPTER 2: LITERATURE REVIEW

The aim of the literature review was to draw on three major bodies of literature that relate strongly to the issue of theory and practice in professional education.

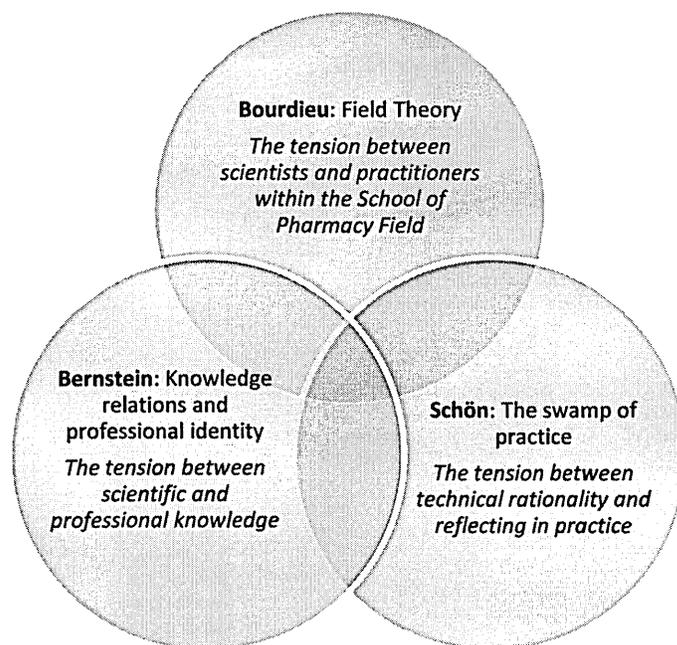
The three selected areas include:

1. Schön's swamp of practice and technical rationality with a discussion of reflection *in* and *on* practice.
2. Bourdieu's field theory within the sociology of education
3. Bernstein's social realist approach with a discussion of knowledge relations and professional identity

These three areas were chosen as they relate to certain key tensions within the area of pharmacy education as shown by Figure 2.1. The review provides a summary of these three areas and incorporates a critical account of the literature drawn on in a way that informs the issue of professional knowledge within the world of pharmacy education.

Overall, the review was designed to take a UK view of pharmacy education but work from the international community was also used to illustrate and consolidate certain themes and concepts that relate to the research questions. Where appropriate to the research questions similar issues from the medical and nursing literature were considered as these are the two main health professions that relate most closely to pharmacy.

Figure 2.1: An overview of the literature review



Whilst this literature review was designed to be narrative in style, a systematic approach was made to the searching and analysis of literature. Some of the methods described were influenced by the practical guide by Aveyard on conducting a literature review (Aveyard, 2006). The following electronic databases and search engines were used: ERIC (United States Education Resources Information Centre), CINAHL (Cumulative Index to Nursing and Allied Health Literature), Pharm-line, Web of Knowledge and Google Scholar. The key search terms used included: pharmacy knowledge; pharmacy education; professional practice education and pharmacy practice.

All literature from 1970 onwards including primary research, review articles, policy documents and professional opinion that appeared to relate to the substantive area was selected and summarised. The summary of each paper

consisted of tabulating a summary of the following areas: the type of study, the main findings, the strengths and limitations of the paper and brief initial notes on how the paper contributed to the area of investigation. Once this summary process had been completed each paper was then assigned a code which aimed to encapsulate the essence of each paper. The categorisation of literature was useful in the organisation of the discussion.

1. Schön: The swamp of practice

Overview

Schön's important and influential work '*The reflective practitioner – how professionals think in action*' (Schön, 1983) outlines a criticism of confidence in professional knowledge. Professionals find it difficult to articulate the areas that lead to 'professional competence' and to make sense of uncertainty within an everyday work context. One of the reasons for this, Schön claims, is that we are bound to an epistemology of practice which does not help the professional describe competence or the importance of competence. The literature review starts by examining the term 'technical rationality' and Schön's topography of professional practice where the high ground of research-based theory is contrasted with the swampy lowland of practice. The emphasis on reflection *in* action where practitioners respond by having a reflective conversation with the situation is contrasted with reflection *on* action as seen in the current continuing professional development (CPD) model within healthcare. Reflection in action is also contrasted with the move towards commodification of knowledge evident within pharmacy and other healthcare professions. The review then draws on

Schön's work on reflection in different contexts. A contrast is seen between creative design professions where reflection in action is evident and scientific professions where practitioners appear to draw on an existing store of worked solutions to a current practice problem. This leads to a discussion of the relationship between technical rationality and social context which is closely related to current pharmacy practice education and Schön's 'rigour or relevance' dilemma. Reflection *on* action as seen in CPD can be linked to Kolb's learning cycle (Kolb, 1984) and the potential problems associated with this interpretation of reflection. The final part of this section of the review draws on Schön's work on educating the practitioner and his concept of a reflective practicum as a setting designed for the task of learning a practice (Schön, 1987 p37).

Technical rationality and pharmacy knowledge

Schön sets the scene by describing the dominant epistemology of practice as 'technical rationality' where "*professional activity consists in instrumental problem solving made rigorous by the application of scientific theory and technique*" (Schön, 1983 p21). The systematic knowledge base of a profession is described as having four essential properties as it is specialised, firmly bounded, scientific and standardised (Schön, 1983 p23). The application of standardised knowledge is seen as important where professionals apply general principles and standardised knowledge to concrete problems.

When considering pharmacy as a profession in relation to 'technical rationality' a useful starting point is to examine if there is any evidence for the values that underpin the practice of pharmacy. For example a study undertaken by Benson et al. (2009) who interviewed 38 pharmacy practitioners from a range of practice

settings and presented various ethical dilemmas concluded that practice was predominantly discussed using a scientific mode of rationality.

Turner and Samson (1995) argue that pharmacists' knowledge base is precise and highly technical and is largely lacking in mystery compared to the more clinical mentality of doctors who are constantly applying knowledge to make decisions in an uncertain clinical environment. To counteract this argument it is undeniable that medical decision-making is now more closely regulated by the enforcement of national clinical guidelines from organisations such as the National Institute for Health and Care Excellence. By contrast pharmacists monitor both patients and physicians' usage of medicines and their professional role can incorporate a surveillance and intervention role. In this role pharmacists can exercise their judgement over the use of medicines and this provides some substantive reasoning for their professional status.

Technological advances have rationalised the pharmacy profession to such an extent that the 'McDonaldisation' theory proposed by Ritzer (2000) strikes a chord with the practice of community pharmacy. For example the introduction of standard operating procedures, protocols for staff-client interactions and in some cases automated robotic dispensing all demonstrate a calculated predictability that is far removed from a professional ethos as described by Ritzer. There is an argument that the push for pharmacists to deliver more general health related services in the community does not raise their professional status as intended but removes them further from their core area of expertise and knowledge which is medicines. The language used in government documentation encourages the delivery of services such as weight management and blood pressure monitoring according to a standardised

template but with little acknowledgement for professional autonomy. The 'pull' to move the pharmacist away from the mechanical dispensing process should be viewed alongside the 'push' to professionalise pharmacy support staff such as the pharmacy technician. Pharmacy technicians can now become accredited to check the prescription for accuracy before the medicines are given to the patient. This final prescription check has traditionally been the professional domain of the pharmacist. It appears that the pharmacist is struggling to claim his/her own professional discipline and status as they diversify and move away from the technical rationality of a clearly defined dispensing process.

An important question asked by Schön is: how did the split between science and practice emerge? Schön describes how technical rationality is the heritage of positivism rooted in the historical rise of the application of science and technology (Schön, 1983 p31). The uncertainty, unique nature, instability and conflict of values seen in practice are observed by Schön as troublesome to a positivist epistemology. This leads to Schön's description of the varied topography of professional practice with the high hard ground where the practitioner makes effective use of research-based theory and technique. This is contrasted with the swampy lowland where situations are confusing "messes" and not amenable to a technical solution (Schön, 1983 p42). A choice is presented for the practitioner between staying on the high ground or descending to the swamp. The choice is further portrayed as a contrast between high ground rigour that deals with problems of little social importance and low ground challenging activities where technical rigour is sacrificed. This stark contrast is a useful framework when considering a healthcare profession such as pharmacy and how future practitioners are prepared for their role.

One example used by Schön is the separation of the medical curriculum into the preclinical science stage and the clinical practice stage which reflects two distinct phases and a separation between theory and practice (Schön, 1983 p28). The traditional pharmacy curriculum was also separated in this way where there is a clear distinction between the scientific early stages of the MPharm and the more practice-based content of the latter stages of the degree programme. Today this clear distinction between science and practice is not encouraged as the regulatory body encourages a more 'integrated' approach to science and practice. My research opens up questions about what integration means and this clearly relates to Schön's swamp of practice and the conflict between rigour and relevance.

In considering the gap between professional knowledge and real world practice Schön draws on the work of Schein and Glazer (Schön, 1983 p45). Schein views the basic and applied sciences as convergent and practice as divergent. One of the characteristics of a profession is the ability to take convergent knowledge and convert it into a professional service. Schön makes it clear that in order to be able to do this the individual needs divergent thinking skills. Glazer made a distinction between the types of profession and labelled medicine and law as a major profession compared to social work which is labelled as a minor profession. A major profession is seen as having a stable institutional context where professional knowledge leads to professional practice. By contrast a minor profession is seen as having no fixed content of professional knowledge and a shifting context of practice. This work acts as a

stimulus to ask questions about pharmacy as a profession and what type of knowledge is used by a pharmacist?

Becher (1989) in his book *'Academic Tribes and Territories'* attempts to distinguish between hard, pure, soft and applied knowledge. This terminology is used to classify disciplines, using a dichotomous system, into hard pure, hard applied, soft pure and soft applied. For example physics is labelled hard, pure science, engineering hard applied, as opposed to sociology which is designated soft pure knowledge and management as soft applied. This approach is limited and a more hermeneutic approach may be more helpful when describing professional knowledge. This is echoed by Moses (1990) in the assertion that using these 'ideal types' as academic disciplines can cause problems for the educational researcher. Becher expands his classification by assigning the term convergent or divergent to different disciplines in terms of their place in the social world and disciplinary community. Immediately this classification moves away from the hard and soft classification as for example physics, mathematics, economics and history can be thought of as representing convergent disciplines that look inward and yet representing both hard and soft sciences. The use of the terms convergent and divergent can be useful when examining the pharmacy profession that is mainly patient facing (divergent) but draws on convergent scientific core knowledge. Välimaa(1998) states that sociology is a 'multiparadigm science', geography and pharmacy are highly multidisciplinary and mechanical engineering and modern languages represent socially divergent disciplines. The multidisciplinary nature of pharmacy can be seen in the following statement that provides some insight into the breadth and depth of pharmacy knowledge:

“Pharmacists through their education and training can consider (and conceptualise) a drug molecule, together with its formulation and delivery as a medicine. They have an in-depth knowledge of pharmacology and therapeutics, physicochemical properties of drugs and excipients, biopharmacy and pharmacokinetics, adverse drug reactions and drug interactions. It is this complex, varied and integrated expert knowledge that qualifies them, and them alone, to make professional judgements relating to medicines.” (Harding and Taylor, 2004)

This quotation communicates a technical rationality and the high ground of the pharmacy profession. However, it is less clear how this knowledge is divergent and is used within the low ground swamp of practice.

One of the problems associated with the analysis of the pharmacy profession in relation to technical rationality is that much of the work undertaken in practice still relates to the supply and dispensing of medication. With the exception of the clinical check of the prescription for appropriateness, all of this type of supply work can be undertaken by a non-pharmacist. In many cases dispensing is delegated to a technician and there is also the controversial issue of doctor dispensing where the dispensing in a medical practice is delegated to unqualified ancillary staff such as a receptionist. Clearly, this reflection on practice contradicts the idea that the professional knowledge and technical rationality required for the work of the mainly dispensing pharmacist is inaccessible.

The claim that pharmacy knowledge cannot be commodified is more difficult to defend in an age where specialist knowledge is more widely available. In many cases patients have a very detailed understanding of their condition. This has been amplified by the use of the term ‘expert patient’ by the Department of Health (Donaldson, 2003). However, while the expert patient may have

accessed specialist information it is unlikely that they will have the global therapeutic overview that is grounded in the specialist and integrated knowledge of a pharmacist. For this reason it would seem justifiable to argue that pharmaceutical knowledge cannot be commodified and packaged as information. With the relatively recent introduction of patient information leaflets with prescribed medication, pharmacists are often approached by patients who query the sometimes worrying content of such information leaflets. It is very difficult for a lay person to assess the practical significance of a catalogue of side effects stated by the manufacturer, without the associated knowledge of pharmacology and risk-benefit analysis.

Reflection in action

An important concept articulated by Schön is 'reflection-in-action' which is seen to be spontaneous, intuitive and difficult to articulate. An example used is the way that a medical practitioner recognises a family of symptoms which "*centres on the 'art' by which practitioners sometimes deal with situations of uncertainty, instability, uniqueness and value conflict*" (Schön, 1983 p50). As an accomplished musician Schön uses the analogy of jazz musical improvisation and being able to think on your feet. When thinking about the epistemology of practice Schön poses the question: is it about knowing more than we can say? The parallel with pharmacy is less clear as the articulation of pharmacy knowledge tends towards a safer evidence-based medicine approach where there is little room for interpretation or improvisation.

In a large systematic review on reflective practice in healthcare professions education Mann et al. (2009) concluded that reflective capacity is regarded by

many as an essential characteristic of professional competence. Schön's work outlines the need for an inquiry into the epistemology of practice or what kind of knowing that competent practitioners engage in, as this is often not verbalised. The way in which Schön challenged practitioners to examine the tension of technical knowledge versus 'artistry' in developing professional standards is particularly relevant to the pharmacy profession and the aim of my research.

Scribner (1986) describes the use of 'skilled practical thinking' as thinking that is embedded in the larger purposive activities of daily life that involve little formal knowledge. The knowledge and skill used in this type of thinking is developed and learned by experience. One clear characteristic of this type of thinking is that it is flexible and in contrast to an algorithmic, mechanical procedure to solve a problem. Formal knowledge in combination with this type of thinking is a powerful and unique tool for problem solving. A typical scenario of this type of skilled practical thinking applied to pharmacy is the way that a pharmacist may use 'common sense' strategies to improve patient adherence to his/her treatment. For example formal (technical) knowledge of respiratory disease is of little use for patients with arthritis who are unable to use their hands effectively to manipulate an inhaler device for asthma without an appropriate practical compliance aid.

Work that is based on reflection in action assumes that the profession has a certain knowledge base to draw on. The question of pharmacy being a knowledge-based profession where practitioners reflect in action is critical to the aim of this research. The McDonaldisation theory (Ritzer, 2000) referred to earlier is relevant when considering the thesis of deskilling of pharmacists and

the general commodification of knowledge. Commodification of knowledge suggests that the pharmacist can be bypassed by providing patients with standard detailed information about their medication. To counter-balance this theory it is necessary to look more closely at the types of knowledge used by pharmacists and the specialist skills that they employ. Skill can be taken to refer to the capacity to accomplish a task, which may be kept analytically separate from the substantive knowledge connected with the task itself (Freidson, 2001). While knowledge and skill are often compartmentalised and seen separately, the term skill cannot be totally separated from knowledge. Traditionally pharmacists utilised their scientific knowledge to develop the skills necessary to formulate, compound and dispense medicines. As this is no longer the role of the community pharmacist (and therefore the majority of pharmacists) it can be argued that the pharmacist has been deskilled and does not have specialist skills. However, in common with many professions the skills used are tacit in that they cannot be completely connected to systematic theory or defined by a clear structure or protocol. It was Polanyi (1967) who made a case for artful practice that is based on experience rather than formal theory. Polanyi argued that in any activity there are two different dimensions of knowledge which are mutually exclusive. Focal knowledge is about an object or phenomenon in focus. Tacit knowledge is a term used to describe how knowledge can be used as a tool to handle or improve what is in focus.

The tacit knowledge of the pharmacist can be demonstrated in such areas as responding to symptoms. While there have been many attempts to formalise this process with the use of protocols and algorithms, all of these processes have a limited value compared to an experienced pharmacist using his/her

knowledge and skill to determine if the symptoms presented are self limiting or whether the opinion of another healthcare professional is required. By contrast, focal knowledge would involve a detailed knowledge of a specific product and whilst this is helpful when responding to symptoms it has much more limited value in solving a problem for a patient. The use of tacit knowledge can also be applied to the pharmacist who is making an ethical decision over the supply of a prescription only medicine in an emergency, or the reporting of suspected misuse of drugs in a client or colleague. The skills involved in these complex decisions cannot always be verbalised and are based on experience rather than formal theory. Tacit knowledge therefore is not codified and can only be transmitted by focused training or more often gained through personal experience. It is this type of knowledge that is more concerned with 'know-how' rather than 'know-what'. One of the problems associated with tacit knowledge is that it becomes deeply embedded in the professional culture, organisation and individual and is difficult to transfer. This is a problem that I explore in the next section of the literature review when I consider Bourdieu's field theory.

Schön distinguishes between reflection '*in*' and '*on*' action. Within healthcare professional culture reflection '*on*' action is commonly seen within continuing professional development (CPD) where the professional is expected to reflect by looking back on his/her practice and use this activity to inform future practice. Reflection '*in*' action implies a much more obscure process where technical problem solving is placed in the broader context of reflective engagement with practice.

Reflection within different contexts

Schön explored how reflection in action takes place using a range of professions and contexts. Using examples from design within the professions of architecture and town planning Schön looked at the conversion of a situation from actual to preferred. It is difficult to see parallels with pharmacy as the pharmacy profession does not appear to be creative in this way. An integral part of the design process is when there are unintended changes and outcomes in the practical process and the situation “talks back” and the designer responds to this (Schön, 1983 p79). The designer is observed to reflect-in-action on the construction of the problem. Schön also looked at the work of a psychotherapist listening to a patient’s problem, taking a history and then making, testing and delivering interpretations of the patient’s data. The reflection is patient-focused and is about the examination of emergent interpretations. There are obvious differences in the way that the architect and psychotherapist work but the common issue is that the professional has to unravel the problem and the problem is not provided in an explicit way. The practitioner treats each case as unique and there are competing ways of solving the problem.

Schön also examined reflective practice in the science-based professions using medicine, agronomy and engineering as typical examples of professions that draw on scientific knowledge. Here, there is a closer alignment to technical rationality as the professional is seen as a technical problem solver. For example the physician uses the techniques of diagnosis and treatment and Schön describes how the science-based practitioner engages in a limited “on-the-spot enquiry” and works by selecting the right problem from a stock of already known problems. However when the science-based professional is

faced with a unique problem then the mapping process of matching the problem to already know problems is not successful and the artistic design process is more appropriate.

Jamous and Peloille (1970) used the term indeterminacy/technicality (I/T) ratio where indeterminacy requires judgement and technicality alludes to a more algorithmic approach. For example a minister of religion may be seen as having a high I/T ratio as they use a lot of indeterminate knowledge that is for the most part inaccessible to the general public and can be seen to use little technical knowledge. Conversely the pharmacist may be seen as having a high technical knowledge with little indeterminate knowledge giving a much lower I/T ratio. This blunt tool can have some value and explains why a patient may have a low expectation of pharmacist input and may be more interested in the technical contents of a patient information leaflet rather than discuss medication issues with a pharmacist. If the indeterminate knowledge of the pharmacist is perceived to be low then the expected input of the pharmacist from a public perspective is minimal. Conversely if the pharmacist can apply his/her technical knowledge to the individual unpredictable human situation, in a way that benefits patients, and brings new meaning to their treatment, then the I/T ratio is raised and the profession moves further away from the situation described in the McDonaldisation theory.

Under-utilisation of knowledge

Schön's work draws attention to knowledge that is used either in a purely technical rational operation compared to reflecting on knowledge in practice when faced with a technical problem to solve. When looking at this within a

pharmacy context it is important to note that knowledge appears to be under-utilised. This section examines some of the problems associated with the under-utilisation of pharmacy knowledge.

The potential under-utilisation of the formal scientific knowledge of the pharmacist can have a significant effect on the motivation of members of the profession and may lead to professional frustration. A study to understand the levels of satisfaction and dissatisfaction within the pharmacy workforce (Boardman et al., 1999) found that about one in three pharmacists were dissatisfied with their work. The findings demonstrated that many pharmacists, even the more recently qualified, feel that their knowledge is under-utilised and their potential contribution to healthcare is undervalued by both patients and other professionals. I consider that pharmacy is essentially a knowledge-based profession where the value of the pharmacist in terms of input into patient care is seen in terms of 'know-how', so I have examined three barriers that impede this process.

Firstly one of the main barriers to the mobilisation of knowledge is the professional dominance of the physician. There is a substantial body of literature on the professional dominance of doctors and their control of healthcare work. It was Freidson (2006) who noted that the threat of other healthcare professions is that they are setting up a healing consultancy which competes with established medical practice. The other side of the argument is that other healthcare professions can be useful in offering support and the doctor can delegate low status or routine work downwards as they become increasingly responsible for specialist care services. To a certain extent this

has happened within pharmacy with the increased emphasis on the provision of routine diagnostic testing and other health related services. It should be noted that these areas of work are not directly related to the pharmacist's core area of formal knowledge, which is therapeutics. A text that examines the division of labour within the nursing profession (Allen and Hughes, 2002) highlights three assumptions of the medical profession that are used to control and protect their own position. The first assumption is that the technical knowledge learned and used by other healthcare professions tends to be discovered, enlarged upon and approved by doctors. For the pharmacist it could be argued that the opposite is true. The pharmacist has the capacity of working as a pharmaceutical scientist who is discovering and developing the agents which the doctor uses and by definition will therefore have a greater knowledge of their use. The pharmacist in his/her community or hospital practitioner role has a broader body of technical knowledge on medicines management that is beyond the scope of the medical prescriber. The second assumption is that the healthcare profession assists rather than replaces the focal task of diagnosis and treatment. To a large extent this is true within pharmacy as the role of the pharmacist and his/her knowledge base is aimed at supporting rather than replacing this key role. The third assumption is that the healthcare professional is usually subordinate. This is not always the case as the pharmacist is ethically bound to challenge the directions of the doctor where this is in the best interests of the patient. Pharmacists are required by their regulatory body to exercise professional judgement. For example a pharmacist may challenge the prescribing directions given by a doctor on a prescription. Many of these prescribing anomalies can be routine problems that can be easily resolved. However on occasion the prescriber may disagree with the viewpoint of the

pharmacist and not agree to change the prescription. If in the professional judgement of the pharmacist the treatment would harm the patient they can refuse to supply the medication. This course of action does not fit in with the subordinate role of the healthcare professional.

Another characteristic that relates to professional dominance is that the prestige assigned to the doctor by the general public is greater and the work of other healthcare professions is subject to the order of the physician. Whilst to a large extent this is true for the dispensing process, this dynamic has recently changed with the introduction of pharmacist independent prescribing. Professional dominance of the doctor may be one of the main barriers for the pharmacist in exercising their formal or technical knowledge. The relationship between the medical and nursing profession has been the subject of considerable interest (Svensson, 1996), but there is limited literature on the relationship that exists between pharmacists and doctors. In situations where the pharmacist may be more knowledgeable than the doctor, for example in the area of clinical pharmacology and pharmaceuticals, this creates an anomaly within the established system of dominance.

Secondly, a barrier to making pharmaceutical knowledge work in practice is the confusion that exists over the role and identity of the pharmacist. Using Weber's construct of the ideal type to determine the abstract and general characteristics of a professional pharmacist I focused on one of the interdependent elements of ideal type professionalism. One element asserted by Freidson (2001) is an ideology that asserts a greater commitment to doing good work than to economic gain and to the quality rather than the economic efficiency of the

work. For the pharmacist who operates within a commercial setting such as the community pharmacist in a retail outlet, the industrial pharmacist striving for greater profits or the hospital pharmacist working towards a reduction of prescribing costs, this particular ideal typical characteristic can seem a long way from the harsh realities of practice. This conflict between commerce and patient care is a significant barrier for the mobilisation of pharmaceutical knowledge. For the public to view the pharmacist as a medicines expert rather than a shop keeper will require significant changes to the way that the pharmacist operates within a retail environment. The typical UK pharmacy still stocks a wide range of peripheral merchandise that does not reflect the healthcare provision. This is in stark contrast to the French *pharmacie* that is clearly denoted by the green cross, the clinical image and the conspicuous absence of any non-medicinal products. For pharmacists to utilise their scientific pharmaceutical knowledge for the benefit of the community there needs to be the delegation of commercial concerns to a business manager and a closer move towards this characteristic of the ideal type. This implies that practical managerial knowledge may become less significant.

The third barrier to the use of the pharmacist's formal scientific knowledge is the internal conflict and division that exists within the profession. Divisions within the community pharmacy sector are weakening the occupation's attempts at reprofessionalisation (Edmunds and Calnan, 2001). There appear to be divisions between independent proprietors and salaried pharmacists working in large chains or supermarkets. Within the community sector there is significant commercial competition between different pharmacies and this can affect internal relations between pharmacists. Many pharmacists particularly

employee and locum pharmacists do not have overall control over their practice as the business objectives of many large organisations are not linked to those of the profession. All of these three barriers affect the full actualisation of pharmacy as a knowledge-based profession. There is the increasingly expressed view from within the profession that pharmacists need to consider how they can re-engineer their practice in order to make the most of the knowledge and skills that only they have (Goundrey-Smith, 2007).

Relationship between technical rationality and the social context

The question to arise from Schön's work is: what is the relationship between a practitioner's narrow technical activity and the larger social context over which he/she has little control. The example cited is a civil engineer that is more concerned about what road to build rather than how to build the road (Schön, 1983 p187). The complexity that this question implies can be applied to other professions. A question posed by Schön is how does the practitioner approach the messy problems associated with his/her work? He argues that it is the wider situation that is part of a legitimate professional concern but this opens up the practitioner to complexity, instability and uncertainty. Where there is the setting of technical problems and the implementation of their solutions science-based practitioners meet the dilemma of "rigour or relevance" (Schön, 1983 p188).

The challenge for a practitioner is to ensure that technical problem solving is embedded in a relevant and rigorous reflection-in-action. Within pharmacy there is an emphasis on technical rationality where reflection is on rather than in practice. This portrays a picture of what Schön describes as a "*lack of reflective conversation with the situation*" (Schön, 1983 p268).

In their study of pharmacy culture entitled: *Are pharmacists the ultimate barrier to pharmacy practice change?* Rosenthal et al. (2010) describe some of the anecdotal characteristics of Canadian pharmacists. One of the characteristics is described as paralysis in the face of ambiguity. The authors of this study draw on Kolb's research on differences observed in academic disciplines (Kolb, 1981) to comment on the pharmacy profession. There is the suggestion that through their scientific education, pharmacists appear to be more comfortable in dealing with abstract concepts and creating theoretical models than applying their knowledge through interactions with patients. The contrast between technical rationality defined as "*problem solving made rigorous by the application of scientific theory and technique*" (Schön, 1983 p21) and the social context of pharmacy is a key tension within my area of research. However, there is also a paradox as technical rationality can also be interpreted as consistent with observable behaviour, competence and relevance as seen within the practice domain.

Schön describes the constraints of a reflective contract in that it is difficult to establish and time consuming. A reflective contract is more appropriate for situations that are neither an emergency nor routine. With the major professions there is the strong presumption of authority and autonomy. The move to a reflective contract involves giving up some of this initial claim to authority and autonomy.

A clear example of a reflective contract from within pharmacy is the challenging process of how pharmacists support patients to take their medicines. Until fairly

recently it was usual to use the inflexible and authoritative sounding terms patient *compliance* or *adherence* which describe how a person takes prescribed medication in accordance with medical advice. In recent years there has been a move towards an increased consideration of the relationship between the healthcare professional and the patient and the use of the term *concordance*. The intention of a concordant approach to the taking of medicines is to encourage an equal partnership and the pharmacist is ideally placed at the interface of this reflective contract between patient and prescriber. The concordance approach is an expression of this perceived need to develop a new model of practice which bridges the gap between the professional and the client.

One of the key conflicts with the minor professions is that research and practice follow divergent pathways and this divergence exacerbates the practitioner's dilemma which Schön calls "*rigour or relevance*". This divergence may result in practitioners forcing practice situations into a mould that has been derived from research (Schön, 1983 p308). For example the research agenda in the area of pharmacy practice is mainly service focused and has a narrow range of emphasis. There is a need for a closer relationship of pharmacy practice research with social theory and other perspectives outside pharmacy (Bissell and Traulsen, 2005 p210). A discussion paper that argues for theory-based pharmacy practice research suggests that engaging with theory provides richer and deeper insights into human behaviour and its social context, which can ultimately contribute to dynamism and diversity in pharmacy practice research (Nørgaard et al., 2000).

Continuing professional development

The work of the American psychologist Carl Rogers and the educational theorist David Kolb relates to the work of Schön in the area of experiential education. In his book *'Freedom to learn'* Rogers (1969) proposes a learner centred model for education where relevance is seen as important and student experience is essential for learning. Rogers highlights the problems associated with forcing concepts making the learner less receptive to the learning process. This links well with Schön's description of the power of individual reflection in action. Kolb outlines his well known learning cycle in *'Experiential learning'* (Kolb, 1984) where he describes four elements: concrete experience, observation/reflection, the formation of abstract concepts and the testing of new concepts through further experience. There are many criticisms of this widely used cycle, the main one being that in practice the cycle is not a series of neat stages but is more blurred between stages. Miettinen (2000) claims that it is epistemologically problematic to talk about an immediate 'concrete experience'. There is not a clear explanation of 'concrete experience' or how this is formed within experiential learning. Kolb's cycle is seen by Holman et al. (1997) as a cycle that is separate from the social historical and cultural aspects of the individual and ignores the social interaction necessary for learning. The current emphasis on reflection *on* practice as seen by the CPD cycle of healthcare professions is based on Kolb's cycle and this appears to conflict with Schön's major work on reflection in practice.

To develop this argument further it is useful to examine another large piece of work within medical education that focuses specifically on the impact of continuing education meetings and workshops on professional practice and

outcomes. A Cochrane review by O'Brien et al. (2001) examined 81 trials that evaluated the effects of continuing education meetings on treatment goals and patient care. The review concluded that the effects on professional practice were small and variable. It was concluded that a combination of both interactive and didactic education was more effective than either approach alone and the effect of specific educational events were less for more complex behaviour and less serious outcomes. It is recognised that this study is based on continuing education as opposed to initial undergraduate education, but it is useful to note the smallness and variability of impact of educational activities on practice outcomes. In view of the rigour of this type of study it is possible that these findings should be taken into account when making changes to the curriculum of healthcare professionals and the debate surrounding evidence of impact related to educational change entered into more fully.

Educating the practitioner

In his book *'Educating the reflective practitioner'* Schön (1987) examines the hierarchy of knowledge within professional schools where basic science is seen to have a higher status than applied science and the technical skills of day-to-day practice are seen at the lowest level. Schön highlights two key assumptions made by university-based schools of the professions. The first assumption is that academic research yields useful professional knowledge. The second assumption is that professional knowledge taught in schools prepares students for real-world practice. Both of these assumptions are questioned with the example given that cognitive psychologists have little to teach future teachers and business-based research is lacking in relevance to the everyday commercial world. Schön describes an undermining of professional educators

to carry out their role. Professional educators see the problem as one of “*keeping up with*” and “*integrating*” into the professional curriculum the stream of potentially useful research results (Schön, 1987 p11). The work of Schön challenges this integration principle: outstanding practitioners are described as having more wisdom, artistry or talent rather than professional knowledge. In Schön’s view the question is not about how we can make better use of research knowledge but rather what we can learn from a careful examination of “*artistry*”. Artistry is defined as the “*competence by which practitioners actually handle indeterminate zones of practice*” (Schön, 1987 p13). However this definition is tempered by competence which may relate to technical rationality. Schön’s description relates to a terrain of professional practice, applied science and research based technique that occupies a critically important but limited territory that is bounded on several sides by artistry. Schön is concerned how future professionals are educated for artistry and develops the concept of a ‘*reflective practicum*’ which aims to help students acquire the artistry essential for competence in indeterminate zones of practice. A ‘*practicum*’ is defined as “*a setting designed for the task of learning a practice*”(Schön, 1987 p37). This implies a context that approximates to a practice world where students learn by doing but are not involved in real world work. The practicum occupies an intermediate space between the world of everyday practice and the theoretical world of the academy. Practicum examples within pharmacy education include: dispensing sessions where students dispense pharmaceutical products to simulated patients, role play scenarios where students are asked to respond to symptoms or interactive exercises with academic members of staff who take on the role of a prescriber or other healthcare professional. Schön draws attention to the need of professional schools to rethink the epistemology of practice and

the pedagogical assumptions about the way that curricula are planned. The reflective practicum is seen as a key element of professional education and can be applied to my exploration of pharmacy knowledge and professional practice.

Summary

Schön's work on reflection in practice leads to a consideration of how this can be implemented in the education of future healthcare practitioners.

Within the medical literature there are a number of studies that examine the views of young physicians on their professional education. One USA study surveyed 4756 physicians from a variety of practice settings and 80% reported that their formal medical training did an excellent job in preparing for practice (Cantor et al., 1993). However, a large proportion (35-63%) would have preferred to have received more training in settings outside hospitals and felt that they needed better preparation for work within a general practice setting. This highlights some of the issues associated with the setting in which placement-based training takes place. For example approximately 70% of pharmacists will work within a community setting but this is not always reflected in the type of placements offered during the undergraduate programme.

A review of the literature suggests that there has been little critical evaluation of how to teach pharmacy students in the practice setting. A view expressed by Strand et al. (1987) is that the didactic methods of the classroom are being transferred into practice-based teaching. Their work highlights the need for the educator to have a different approach when engaged in teaching in a practice-based setting. The pharmacist is required to solve therapeutic problems and make clinical judgements and this is more closely aligned to a student-centred,

problem-based approach as opposed to a teacher-based (subject) approach. The place of reflective learning continues to be a key area in the professional education arena. The main premise of Schön's work is that professional education should be centred on enhancing the practitioners ability for reflection in action, by learning by doing and developing the ability for continued learning throughout their career. Whilst these aims are highly desirable it is a practical challenge to provide a relevant and balanced programme that is fit for purpose and produces a 'reflective practitioner'. A large study that assessed the current and ideal emphasis for curriculum coverage of 33 generalist curriculum topics in 71 American pharmacy programmes stated that the most significant barriers to curriculum reform are the limited availability of clinical training sites and an already overcrowded curriculum (Graber et al., 1999). Clearly there are a number of significant curriculum changes within pharmacy education that are being encouraged, implemented and in some cases evaluated. What is less clear is whether these changes address the relationship between theoretical knowledge, education and professionalism within the pharmacy profession. Curriculum development in areas such as problem-based learning and interprofessional education both provide some insight into potential solutions to the widening gap between an academic programme and professional practice. However, an important question is the one posed by Anderson Harper et al.(1996 p319): "*how can we assure that pharmacy educators understand that the curricular reforms being proposed, indeed those that have been proposed for over 70 years, must involve not simply changing a curriculum plan, but adapting and modifying one's view of the role of the teacher, the student and the environment in which they operate?*" This line of enquiry leads us into the second part of this review which examines the link between Bourdieusian field

theory and a discussion of ideas, norms and beliefs about the pharmacy education field.

2. Bourdieu: Field Theory

Overview

As a reflexive practitioner at the top of the French academic and intellectual world, Bourdieu did not make a distinction between theory and practice. Instead of seeing theory and practice as separate entities Bourdieu's view is that the practitioner cannot engage with theory without drawing on practice and vice versa. The work of Pierre Bourdieu is therefore particularly relevant to an exploration of pharmacy knowledge and practice. In *'The logic of practice'* Bourdieu (1992 p80) describes how practice is often described negatively, particularly the mechanical aspects that appear to oppose logic and discourse. His work aims to bridge the gap between some of the traditional dichotomies such as individual agency more closely aligned to practice and institutional structure underpinned by theory. The potential application of Bourdieu's theory of practice to areas such as nursing research is key to the development of practice innovation and policy change (Rhynas, 2005). A review of the literature reveals that this appears to be a neglected perspective from within the world of pharmacy education. Whilst recognising that Bourdieu has generated a large and complex body of literature my review focuses on some key concepts that can be applied to pharmacy education such as: species of capital, field and habitus. These concepts will now be explored and illustrated by reflecting on some literature from pharmacy education and how these can inform the issue of theory and practice within professional education.

Forms of capital

Capital as described by Bourdieu takes various forms and is used by agents within a particular field. Examples of different species of capital include: economic, cultural, social and symbolic capital. Economic capital is concerned with gaining control over money and materials. For example economic capital is gained by receipt of a research grant or having access to specific laboratory equipment.

In his essay 'The forms of capital' Bourdieu (2008) outlines cultural capital in three states: embodied, objectified and institutionalised (Ball, 2004). Embodied cultural capital is the long lasting disposition of the mind and body and a useful example is the mastery of and relation to a specific language. Objectified cultural capital refers to cultural good such as books, instruments and machines. Institutionalised cultural capital is the objectification of capital through academic qualifications. Cultural capital includes areas such as knowledge, experience and social connections that can give the individual or group power to succeed within their field. For example the cultural capital of a group of research chemists would include their formative education in their discipline, doctoral and post doctoral research, possibly industrial experience, cultural knowledge taste and a wide range of connections with others (social capital) within their specific discipline. By contrast the cultural capital of pharmacy practice academics is more embedded within their experience of hospital or community practice, their experience with patients and other healthcare professionals.

In some ways the term culture can be unhelpful as a framework, due to the multi-dimensional layers and complexity of both higher education and the pharmacy profession. For example Välimaa argues that whilst culture is a difficult instrument as it is defined in too many ways it is a tempting intellectual device in social research because it provides researchers with a conceptual bridge between micro and macro levels of analysis (Välimaa, 1998). Välimaa highlights the differences between analysis of disciplinary cultures which focus on the individual academic and institutional cultures bounded by higher education institutions. Välimaa argues for the use of the term 'academic identity' when applying a cultural framework to higher education (Välimaa, 1998). Within the pharmacy education world I view culture as the link between the individual social actions of pharmacy undergraduates, academic members of staff and pharmacy practitioners and the structural outcome of the pharmacy graduate working within the profession. Whilst academic identity can be a useful way of approaching research into individual perceptions of pharmacy knowledge, Bourdieu's use of the term cultural capital addresses a situation of potential conflict as seen between the areas of science and practice within the world of pharmacy education.

Social capital is defined as: *"an aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition"* (Ball, 2004 p21). This involves membership of a group where the volume of social capital depends on the size of the network of connections. Social capital is never completely independent of economic or cultural capital.

Social capital includes relationships, networks and being able to influence others. Social capital is also described as being made up of social connections which are convertible under appropriate conditions into economic capital (Richardson, 1986 p241-58). For the academic microbiologist in a School of Pharmacy this may include being part of an influential research group and maintaining contact with leaders in the field. For the pharmacy practice academic social capital could take the form of productive relationships with other healthcare professionals and the development of innovative practice by working with others.

In his book *'Language and symbolic power'* Bourdieu (1991) examines how the term symbolic capital is used to describe a number of positive attributes leading to increased resource, knowledge, prestige or recognition. For the academic this could be achieved for example through recognition of published work by established peers resulting in invitations to conferences to provide further presentation and networking opportunities, leading to further symbolic capital gains. Symbolic capital for the pharmacy practice academic may be increased by reference to their previous or current status as a practitioner. For example the Director of Pharmacy in a large teaching hospital would be viewed differently to the pharmacist-manager of a local independent pharmacy.

The School of Pharmacy Field

The term 'field' was used by Bourdieu as a means of describing the network of objective relationships both historical and current anchored in the types of capital already described. All fields involve 'agents' that have a stake in the operation of the field. For example pharmacy education and practice is the field

that is determined by the position of the agents (academics, practitioners and other members of staff) within the field. A move towards a policy of increased emphasis on a specific curriculum area will have consequences in terms of conflict and competition as agents try to gain monopoly of the most effective capital in their field. The current increase in the practice content of the curriculum would lead to increased cultural and symbolic capital for the pharmacy practice academic as this area of knowledge is expanded and elevated. Conversely science-based academics may feel that their cultural and symbolic capital is being eroded which may result in conflict with their practice-based colleagues, or looking for other species of capital that could be exploited. Bourdieu used the analogy of a magnetic field (Bourdieu, 1969 p89) to describe his concept of a field, showing the strong polarised forces and their effects. Each field has its own logic and regulation but power is seen as the most important influential factor as this structures the field. The different structures of different fields all relate to the agent's relationship with capital and relative importance or weighting given to different forms of capital. For example fields are fluid structures and if a School of Pharmacy is seen as a field the relationships and power struggles within this field would change considerably if the MPharm programme moved from the current four year programme to the proposed integrated five year programme. The proposed move to a more clinical five year programme could result in the social capital manifested in local practice connections becoming more important than it is today, with consequent shifts in the power and position of agents within the field. The field theory proposes that fields are spheres of action that are autonomous and defined by their differences. For example scientific (laboratory-based) practitioners differ from clinical practitioners in obvious external ways such as how they dress and

their career pathway but also in less obvious ways such as the way that they think or hold certain beliefs. All agents occupy positions in the field that are aimed at conserving or transforming the structure of relations of forces that make up the field. In a School of Pharmacy I would perceive that science-based academics are concerned with the conservation of a scientific education and the immense value of this for the future pharmacist. By contrast I would see pharmacy practice academics as transforming by supporting a pragmatic skills-based curriculum. Both of these approaches can lead to conflict and changes within the field. It is this Bourdieusian fluidity that supports my exploration of pharmacy knowledge and professional practice.

One way of examining the School of Pharmacy field is to examine the views of academic pharmacists. In a review from the United States, Skau (2007) found that one of the negative outcomes of an increase in experiential practice training has been the reduction in basic science education. One example described is that many American Schools of Pharmacy have reduced or terminated the pharmacognosy (natural products) component of their pharmacy programmes in recent years. This reduction in the teaching of natural product chemistry has coincided with a massive public interest in herbal medicine and dietary supplements. An argument used by Skau is that a science-based education with its associated skills is necessary in order to practise evidence based medicine in the 21st century. This view is echoed in the UK government document *'Pharmacy in England'* which states that, "*good science lies at the heart of knowledgeable, inquisitive practitioners who also recognise their limitations and are keen to address them. In this way, rational, clinical decision making is achieved*" (DOH, 2008 p90). In an analysis of different pharmacy

programmes in the United States, Figg and Cox (2003) expressed the view that there was a need to return to the fundamentals of pharmacy knowledge being science-based. For example the introduction of newer areas such as pharmacogenomics (study of genetic variations and drug response) into pharmacy degree programmes is seen as important, so that future pharmacists have the ability to communicate with scientists in this emerging area. However, it should be noted that the same scientific journal published the directly opposite position where the importance of a practice-based education was expressed in an article entitled: *'Back to Basics – an alternative viewpoint'* (Foote and Lin, 2004). This literature draws attention to the differing views and conflicts within Schools of Pharmacy and the fluidity of Bourdieusian capital within this field as agents defend or attempt to extend their own academic speciality.

A criticism of applying Bourdieu's field theory to pharmacy education is that the transference of capital in its various forms is seen at an individual academic and institutional level. This does not necessarily fit easily with a profession that is bound by ethical professional standards. For example an assumption made about a pharmacist is that his/her main concern is the patient and the provision of pharmaceutical care. Pharmaceutical care can be defined as the:

"responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient's quality of life." This process involves the pharmacist working with a patient and other healthcare professions in designing, implementing and monitoring a therapeutic plan that will produce specific therapeutic outcomes for the patient (Hepler and Strand, 1990 p539).

Typically a School of Pharmacy has a combination of both pharmacists and

non-pharmacists so the field consists of individuals who are motivated by very different issues.

Other literature than can be framed within Bourdieu's field theory is the consideration of pharmacy education as a Community of Practice (CoP). Historically, professional pharmacy education was undertaken only within a CoP by an apprenticeship. With the shift of professional education to universities with the aim of providing a more uniform and efficient teaching of the pharmaceutical sciences, an ever widening gap was created as universities worked towards making explicit what was previously implicit. The distance between the University and professional practice has already been acknowledged in the reference to Schön's work '*The reflective practitioner*' (Schön, 1983). One approach to the problem of increased distance between academia and practice is suggested by Duncan-Hewitt and Austin (2005) who put forward a proposal to radically restructure pharmacy education, by considering Pharmacy Schools as Expert Communities of Practice. This work implies that in our current educational model our educational 'client' is the student and our 'consumer' is the practice site that employs the student. In the new CoP model our educational clients would be practitioners, ranging in expertise from the novice (student) to the continually developing expert. The consumer in the new model would be patients and society. It is suggested that the CoP will lead to increased student and pharmacist expertise and expand and enrich the scientific basis for the concept of pharmaceutical care.

Habitus

Bourdieu maintains that the field is influenced by a mental or cognitive system of structures he called 'habitus'. The term habitus expresses on the one hand, the way in which individuals 'become themselves' by developing attitudes and dispositions and, on the other hand the ways in which those individuals engage in practices (Webb et al., 2002 pxii). Habitus is the embodiment of external social structures acquired by experience. It is these structures formed by individuals within the social world which produce thoughts and actions that form the social world, which in turn then structures the social world. Habitus can be collective in that it is similar in groups of people with shared aims. The habitus constrains a person but does not determine thought and action as it only disposes a person to act in predictable ways. Bourdieu suggests that we are influenced by 'practical sense', not just by habitus. When our habitus is in tune with the field we have evolved in then we can react to a situation immediately as we are in tune with the situation. For example the experienced analytical chemist faced with an instrumentation problem or anomalous result would have the habitus to react in an appropriate way. Similarly the pharmacy practice academic would feel comfortable within a hospital ward and would be able to adapt his/her placement teaching to the uncertain clinical environment. Clearly if habitus does not match the field we are in then we are a 'fish out of water'. The ideal is the unconscious fit between habitus and the field of operation.

A text that has had considerable influence on my methodological thinking in this area is *'Science of Science and Reflexivity'* (Bourdieu, 2004) where he examines some of the social mechanisms that orient scientific practice. This analysis takes place in a climate where the autonomy and position of science is

threatened by social and political interests. The increasingly blurred edges of science and practice are especially relevant to the world of pharmacy.

Historically the pharmacy curriculum included traditional sciences such as chemistry and botany but this has moved considerably to a scientific content that could be considered to be applied or integrated science. On describing science Bourdieu (2004 p4) states his hesitation:

“One cannot talk about such an object without exposing oneself to a permanent mirror effect: every word that can be uttered about scientific practice can be turned back on the person who utters it.”

In his earlier book *‘Homo Academicus’* Bourdieu (1988) examines the French higher education system and describes opposing poles of cultural capital within different areas. For example he claims that medical research is more oriented to the direction of pragmatic laboratory studies and technology so that the focus is on *“grantsmanship rather than scholarship”*. Members of this group tend to be from socially elite backgrounds and have a vested interest in maintaining the status quo of university culture. There is a tendency to marginalise any ‘heretical’ views or those members who are not outstanding academically.

The scientific field is a set of local fields and there is a hierarchical structure where different disciplines occupy a different space within the hierarchy. The term *‘Lavoisier syndrome’* as used by Pierre Laszlo describes how the 18th century chemist preferred to call himself a physicist (Bourdieu, 2004 p67). This was due to his view that physics is a theoretical and empirical science compared to the lower status of chemistry with its practical applied tasks and application to fertilizers, medicines and insecticides. Chemistry has been linked with recipes and cooking and Laszlo refers to the *“childish aspects of chemistry”* (Bourdieu, 2004 p67). It is useful to relate this to the stereotyped pecking order of pure science: mathematics, physics, chemistry and biology where the applied

sciences are viewed at a lower level than pure sciences. Until the recent formation of the General Pharmaceutical Council which is the new regulatory body for pharmacists all new entrants to the profession were issued with a certificate stating that they were registered as a 'pharmaceutical chemist' and the register was described as a register of pharmaceutical chemists. The certificate was required by law to be on display in a pharmacy. Today a new entrant to the profession is not issued with a certificate but is simply provided with a registration number and there is no reference to a register of pharmaceutical chemists. The only notice that is required to be on display in a pharmacy is a simple statement of the name of the 'responsible person' and a registration number. These are significant changes in terms of the relationship of pharmacy with science and its status as a scientific profession.

In an academic pharmacy setting I would suggest that the field occupied by a Professor of Pharmaceutical Chemistry is very different to the field occupied by colleagues working within the discipline of Pharmacy Practice teaching and research. It is only over the last three decades that Chairs in Pharmacy Practice have started to emerge. According to Bourdieu in '*Homo Academicus*' (Bourdieu, 1988) there is movement between fields to compensate for overcrowding in fields and often using the techniques of the higher status field to gain a foothold in the lower status field. This is not always appropriate when for example pharmacy practice researchers start to apply the techniques of science to the very different field of practice. Bourdieu describes how scientific researchers often "*put an end to their experimentation when they think that their experiment is consistent with the norms of their science and that they can confront the expected criticisms*" (Bourdieu, 2004 p71). It would appear that within a scientific community individual constructions are in fact collective

constructions that will fit in with the wider scientific community. This suggests that the scientific community is not regulated so much by rules of epistemology, methodology or logic but by principles of sociability of the field and if these sociability rules are ignored then individuals are excluded from the field. For example the pharmaceuticals researcher needs to ensure that colleagues within the scientific community agree with the basic principles of his/her new way of formulating a medicine. By contrast a pharmacy practice researcher is more relaxed about uncovering uncomfortable issues related to the delivery of pharmaceutical care that may or may not be acceptable within the pharmacy community.

One of the stereotyped characteristics of science is what Bourdieu describes as its 'disinterestedness' but when the scientific world is viewed using a theoretical framework of fields and habitus this characteristic is not always clear. In a scientific field there can be the unconscious promotion of self-interest through a logic of practice that can remain invisible to scientists who operate within it.

An important example of habitus within the world of pharmacy is the way in which pharmacists alongside other healthcare professionals have struggled with the professional dominance of doctors and their control of healthcare work. This has already been discussed in relation to the under-utilisation of knowledge in the review of Schön's swamp of practice. Freidson (1988) sees paramedical professions as organised around the work of healing, which is ultimately controlled by physicians. Overall this is true for pharmacists in both a hospital and community setting. There is a strong argument that the pharmacy profession has the knowledge base to control the symbolic transformation of the

pharmacological entity (the drug) into the social object (the medicine) and all that this implies but has failed to gain control in this area (Harding and Taylor, 1997). One of the arguments against the professionalisation of pharmacists is that they have failed to secure control of the social object of their work, namely medicines (Denzil and Mettlin, 1968).

In contrast to the education of doctors and nurses there has been a culture of distancing the education of pharmacists from the end product of how a pharmacist operates within professional practice. However, the development of pharmacy education needs to look beyond the 'end product' of the pharmacist and the correlation of this ideal with curriculum content. Schön's paper on the crisis of professional knowledge and the pursuit of an epistemology of practice (Schön, 1992) highlights the dangers of a positivist philosophy and the separation of the ends from the means within vocational education. Schön's argument for developing a model of an epistemology of practice is based on reflection in and on practice. My interpretation is that a clearer articulation of Bourdieusian habitus of individual pharmacy educators would make a useful contribution to the development of this model.

Another example from the pharmacy literature that can be framed within an understanding of Bourdieu's habitus is the introduction of social and behavioural sciences within the MPharm curriculum. The traditional habitus of the academic pharmacist is either a scientific or clinical domain of knowledge. One strategy that aims to bring a different dimension to the mainly scientific curriculum is the introduction of social and behavioural sciences. This move has been discussed previously as one of the drivers for the expanded pharmacy curriculum.

However, one of the problems with the introduction of this area is to define what is understood by 'social and behavioural science' within the context of pharmacy. An international questionnaire based survey representing 17 countries and using a snowball sampling method to survey 62 respondents concluded that there was no clear definition of what constitutes social science within pharmacy (Ryan et al., 2007). This study suggests that a wide range of subjects from scientific content to behavioural sciences were all labelled as 'social pharmacy' and there was a lack of development of a theoretical base for this element of the curriculum. These results are also echoed in the smaller questionnaire study of Schools of Pharmacy in the UK. This UK study also concluded that whilst all Schools taught social pharmacy there was a wide range of interpretation about how social pharmacy is defined (Harding and Taylor, 2006). For example areas covered included definitions of health and illness and health inequalities but basic social theory was taught in less than half of the Schools. Schools of Pharmacy and individuals within the field have some hesitation about this emphasis and this may be due to a lack of alignment of social and behavioural sciences with individual habitus.

The inculcation of professional values and professional socialisation is another key area that needs to be considered in relation to Bourdieusian theory. A comparative study of different nursing programmes using semi-structured interviews concluded that the provision of high quality role models from both education and practice establishments is critical for the professional socialisation of student nurses (Fitzpatrick et al., 1996). There is general agreement that professionalism within pharmacy needs to be strengthened, but a report from the USA highlights the difficulty in defining what professionalism is

in relation to pharmacy (Beardsley, 1996). The report suggests strategies for strengthening professionalism in the pharmacy education experience and these proposals major on the areas of student recruitment and admissions, educational programmes and the teaching of pharmacy practice. One criticism of this report is that it aims to reduce the concept of professionalism to pragmatic manageable chunks. Whilst this is useful it does not engage with the underlying philosophy behind professionalism. To engage with a culture of professionalism it is important that the student is immersed within a professional culture and environment within the School of Pharmacy. Bates and his colleagues (2004) argue that one of the problems of increasing pharmacy student numbers is that in a diminishing pool of full-time pharmacist academics there will be fewer opportunities for students to engage with pharmacist academics. This will result in limited opportunities for students to absorb the culture of pharmacy and hinder their development from student to autonomous professional. A criticism of the 'McDonaldisation' of pharmacy education suggests that another consequence of increased student numbers is that higher education institutions strive for efficiency and there are the associated pressures of rationalisation and increased surveillance (Taylor and Harding, 2002). The authors argue that there are reduced opportunities for intelligent, reflexive thinking or the participation in small group learning exercises, which will result in a reduced capability of vocational students to solve problems and exercise professional judgement. Whilst this commodification theory as applied to pharmacy is based on opinion rather than empirical research it does appear that these views are grounded in some of the anecdotal practicalities of higher education culture. These practicalities and their potential impact on a vocational pharmacy degree course all need to be taken into consideration when

developing a theory of professional identity. The Bourdieusian use of the terms capital, field and habitus can support the pharmacy education researcher in this endeavour.

Summary

Overall, Bourdieu attempts to link objective and subjective aspects of social life in a theory of social practice. Bourdieu draws attention to the dualism and artificial opposites that have shaped theoretical thinking. To critically look at the extremes of objectivism and subjectivism involves a breaking down of these into observations of people's activities or practice.

In the influential publication *'The structure of scientific revolutions'* Kuhn (1970) describes the discontinuous nature of science compared to the positivist philosophy of a continuous movement and accumulation of scientific knowledge. Kuhn describes the scientific community as a closed community of scientists with a disciplinary matrix paradigm. Kuhn's view is that scientists take for granted that existing theories and methods are valid and are dominated by central norms. Bourdieu draws attention to Kuhn's work by stating that revolution within science implies that science is based on tradition and most science involves *'puzzle solving activities'* (Bourdieu, 2004 p16). The language of science is described as an empiricist repertoire, conventional and impersonal where there is the assumption that the physical world acts and speaks for itself. Bourdieu describes a structured field of forces where there are struggles to either conserve or transform the field by agents whom he equates to isolated scientists. The scientist is a scientific field made flesh and the dominant agent can ensure that the structure works in his/her favour by the accumulation of 'scientific capital' which is a form of 'symbolic capital'. In this way the individual

scientist works towards the creation of a space which also determines his/her identity.

Bourdieu speaks of being caught up and comprehended in a world that I take as an object (Bourdieu, 2004 p115). This rings true from my review of the literature and exploring pharmacy education where I have aimed to construct a truth about the object (pharmacy education and its world) knowing that I have to integrate both my own background and the vision of the practical arena within which I operate. This may lead to the illusion of absoluteness and a state where I become unaware that this is a point of view. It is the reflexive journey of this research process that is important in the uncovering of new perspectives in this field. However, before engaging in this process it is important to explore a third perspective through a discussion of knowledge relations and professional identity.

3. Bernstein: Knowledge relations and professional identity

Overview

In the introduction to her book *'Why knowledge matters in curriculum – a social realist argument'* Wheelahan (2012) argues that theoretical knowledge is socially powerful knowledge and access to theoretical knowledge is important as it provides access to society's conversation about itself. This relationship between theoretical knowledge and society is fundamental to a review that explores theory-practice issues within a vocational education programme such as pharmacy. In this third part of the review I draw on the work of the sociologist Basil Bernstein who used a social realist approach to knowledge and developed

ways of describing the differences between different types of knowledge and linking knowledge to different social organisations.

The linking of the social and historical context of knowledge and how this knowledge is differentiated can be linked back to the work of the French sociologist Durkheim. Through an exploration of the place of religion in primitive societies Durkheim distinguished between the profane and sacred in terms of meaning within different societies. For example the term profane is used to describe everyday responses to the practical and immediate, whereas the term sacred he used to describe religion which he viewed as conceptual and an output of society rather than rooted in everyday problems. The term sacred was eventually used for other types of knowledge such as science, philosophy and mathematics. For the educator the profane can be linked to on-the-job training and sacred can be linked to off-the-job theoretical education. Within pharmacy education the disciplines of chemistry and physiology (sacred) can be distinguished from communication skills and dispensing (profane). An important aspect of the sacred domain is the ability to predict beyond the present situation and apply concepts to different alternatives by making connections with unfamiliar territory.

Bernstein outlines his views on the divorce of knowledge from the knower when he discusses Durkheim's observations about the medieval curriculum at the University of Paris. This ancient curriculum included the Trivium (logic, grammar and rhetoric) focusing on the 'word' and the Quadrivium (arithmetic, geometry, astronomy and music) focusing on the 'world'. In Durkheim's terms the Trivium 'word' (inner) must precede the Quadrivium 'world' (outer). Bernstein contrasts

this medieval period where knowledge was an outer expression of an inner relationship with the current secular concept of knowledge where “*knowledge is divorced from persons, their commitments, their personal dedications.*” (Bernstein, 2000 p86). There is a contrasting description of knowledge today flowing like money to wherever it can create advantage and profit. Bernstein draws attention to market principles that give rise to what he calls a dislocation of knowledge where the two major markets are knowledge itself and potential creators/users of knowledge. In contrast to the ancient Trivium and Quadrivium where inwardness was a prior condition of knowing, today there is a disconnection between inner and outer and an increased emphasis on a response to market forces.

This review will focus on the following Bernsteinian terms: vertical and horizontal knowledge, singulars, regions and genericism. These concepts will be discussed and then applied to the ongoing theory-practice debate within pharmacy education.

Vertical and horizontal knowledge

In his essay on vertical and horizontal discourse in *‘Pedagogy, symbolic control and identity’* Bernstein (2000) observes that the description of the contrast between specialist knowledge and local everyday knowledge can be restricted as there is only limited acknowledgement of the social basis for these different forms of knowledge. Bernstein uses the vertical and horizontal description to develop a more systematic language of description of knowledge types and how these different types of knowledge are related. Horizontal discourse is typified as everyday or ‘common sense’ knowledge that is segmentally organised but

not all segments have equal importance. A more detailed definition is that horizontal discourse “*entails a set of strategies which are local, segmentally organised, context specific and dependent, for maximising encounters with persons and habitats*” (Bernstein, 2000 p157). By contrast a vertical discourse is “*coherent, explicit, systematic and principled structure, hierarchically organised as in the sciences*” (Bernstein, 2000 p157). Bernstein speaks of strong distributive rules regulating access, transmission and evaluation but is not concerned with the arenas and agents involved in these regulations. A triangle is used to depict the hierarchical structure seen within a vertical discourse where there is a broad base leading to a powerful apex. Integration of knowledge is possible at the lower levels and this broad base leads to increasing levels of abstract ideas.

The horizontal discourse is expanded by referring to a fictitious horizontal community where Bernstein (2000) refers to the repertoire of an individual in contrast to the reservoir of the community. Repertoires are different for members of the community but have a common nucleus and there is a need for an exchange between repertoire and the reservoir. The segmental principle suggests that what is acquired in one segment may have no relation to another segment. The horizontal discourse is context specific and context dependent and embedded in ongoing practices.

Bernstein summarises the pedagogy of vertical and horizontal discourse by drawing out a series of differences (Bernstein, 2000 p160). For example from a practice perspective vertical knowledge is seen more as institutional whereas horizontal knowledge is seen as local. In terms of social relations vertical

knowledge is more aligned to the individual whereas horizontal knowledge is communalised. The distributive principle of vertical knowledge is recontextualisation which is in contrast to horizontal segmentation of knowledge. The acquisition of vertical knowledge is through graded performance which differs from the competence required within horizontal knowledge structures.

It is useful to discuss Bernstein's proposed differences in relation to pharmacy education and professional identity. These are anecdotal observations as there is a lack of literature in this area. For example the traditional sciences used as a foundation for studying pharmacy are often drawn on from the resources of the university institutional community whereas the practice-based teaching is locally defined by a group of practitioners and placements. The scientific community has a tradition of working in a more individual laboratory-based context when compared to a group of pharmacy practitioners who work across disciplines using patient outcome as a focus for their endeavours. Vertical knowledge within a pharmacy context such as understanding an analytical chemistry technique is distributed by a recontextualisation of that knowledge to support the learner in understanding scientific principles. By contrast the practice curriculum that includes such topics as dispensing and medicines law tends to be viewed as a series of segments that need to be completed in order to have a knowledge of 'practice'. It is possible that scientists utilising vertical knowledge tend to be more comfortable speaking about an assignment grade whereas practitioners using the dimension of horizontal knowledge are more concerned about meeting a minimum standard and use the term competence.

The pyramidal vertical knowledge structures are seen most clearly in the physical sciences where there are several layers, with each layer involving higher levels of generalization and abstraction. For example an understanding of the mode of action of an antibiotic depends on an understanding of different chemical functional groups, which in turn depends on a basic knowledge of organic chemistry. By contrast horizontal knowledge structures involve a number of separate specialised languages that are not linked. Moore and Muller (2002) describe how Bernstein includes some elements of horizontality within the vertical structure and how there are vertical elements within the horizontal structure and refers to these as 'fractal divisions'. In the antibiotic example the fractal divisions could refer to the horizontal issues such as communication with a prescriber about patient hypersensitivity between different groups of antibiotics. The horizontal communication skills are dependent on vertical knowledge structures associated with organic chemistry and pharmacology.

It is useful to relate Bernstein's work to other literature that distinguishes between different knowledge types. In their discourse exploring the changes in the mode of knowledge production in contemporary society Gibbons et al (1994) distinguish between Mode 1 knowledge generated within a disciplinary, primarily cognitive context and Mode 2 knowledge created within a broader, transdisciplinary social and economic context. This work recognises the problems associated with describing the new production of knowledge (Mode 2) in terms of the old and the problems associated with the use of language to describe what is happening in the production of knowledge. It would be useful within pharmacy education research to consider the attributes of Mode 2 knowledge alongside Bernstein's horizontal knowledge and apply this

framework to the pharmacy profession to consider how the pharmacist may contribute to the production of new knowledge.

There have also been attempts to classify different bodies of professional knowledge by their epistemological roots. For example, the professions can be divided into classes depending on whether the cognitive base is primarily descriptive or prescriptive. Descriptive forms of knowledge include scientific knowledge and give rise to an authority that is based on a descriptive and technical process. Conversely prescriptive knowledge which includes such areas as law, religion and ethics is based on normative values and claims moral authority. Halliday (1987) in his study of the legal profession recognised that this tool was too simplistic as different professions can contain both scientific and normative disciplines. Halliday used the term syncretic to describe the situation where a mixed form of knowledge is evident. Pharmacy is a profession that this term could also be applied to. The descriptive knowledge that is the basis of a scientific profession cannot be separated from the prescriptive knowledge of law, ethics and social science. Contemporary pharmacy practice demands a practitioner who has problem solving capability and is able to exercise both technical and moral authority. The concept of fractal divisions of vertical and horizontal knowledge structures can support our thinking in this area.

Singulars and Regions

Bernstein uses the terms singulars and regions as part of this discourse on knowledge relations (Bernstein, 2000 p52). Singulars are seen as distinct knowledge structures where a space is created with a unique name as part of a

specialised discrete discourse. Singulars are orientated by their own development and protected by strong boundaries and hierarchies. For example traditional sciences such as physics, chemistry and biology can be considered to be singulars.

Regions arise from the recontextualisation of singulars into larger units that operate both within the intellectual field of a discipline (singular) and in the field of external practice. For example medicine, engineering and architecture are seen as traditional regions. Contemporary examples of regions include areas such as business studies and media studies. There is an increase in the number of regions within higher education and regions are in a state of flux as disciplines entering a region change. For example the region of medicine now includes the sociology of medicine. A key characteristic of regions is that they are outward facing and respond to market forces. Where a number of singulars are brought together within an integrating framework, these can be termed a region. Regions face outwards towards the field of practice in comparison to a singular that faces inwards back into the knowledge area. An example of a region within the MPharm curriculum could be pharmaceutical compounding where a range of singulars such as microbiology, chemistry, mathematics and physics are applied to producing a pharmaceutical preparation that can be used in practice. It can be argued that pharmacy knowledge has become more regionalised in contrast to an educational past where singulars were the usual form of knowledge structure. For example historically the detailed study of botany (singular) would have been seen as a vital component of any pharmacy education, whereas today any elements of relevant plant science are integrated into areas of the curriculum such as medicinal chemistry. Moving even further

from the regionalisation of knowledge there is the increasing move towards genericism which is discussed in the next section.

Genericism

Genericism is a term that refers to areas such as: core skills, thinking skills, problem solving and teamwork, which are characterised more by flexible, transferable potential rather than specific performance. These generic, skill-based areas are far removed from the 'pure' inward looking singular and are more aligned to the external market of the workplace. Bernstein describes generic modes as "*based on a new concept of 'work' and 'life' which might be called short-termism*" (Bernstein, 2000 p59). There is a continuous development, disappearance and replacement of skills, tasks and work areas which leads to a new ability defined as 'trainability' so that the individual can cope with the demands of working life. Bernstein describes the concept of 'trainability' as "*something the actor must possess in order for that actor to be appropriately formed and reformed according to the needs of technology, organisation and market*" (Bernstein, 2000 p59).

The move away from singulars towards regions and ultimately towards genericism is an area of interest for this review. For example a study by Jesson et al. (2006) involved focus groups with 44 volunteer students from 9 Schools of Pharmacy and explored students' attitudes and experiences of their studies. Most students thought that there was too strong an emphasis on science components in the early part of their studies but later in the course realised that this was necessary. There were strongly held attitudes across all years of the programme that it would be beneficial to include more practice-related material

at the beginning of their studies. Small studies such as this suggest that pharmacy will remain a degree built on a strong scientific background but the contextualisation and sequencing of material within the degree could have a considerable impact on student learning. These findings can contribute to a study of knowledge relations and professional identity as they open a window on how students perceive their pharmacy programme and ultimately the future professional identity of pharmacy.

An alternative approach to the curriculum that aims to integrate and improve practice skills or in Bernsteinian terms utilise horizontal structures is problem based learning (PBL). The PBL approach has been widely used within the healthcare professions and presents the student with a problem that forms the basis of generating suitable learning outcomes. A large integrative review of published literature in relation to nursing, health science education and professional education examined the development of critical reflection for professional practice through PBL (Williams, 2001). The study concluded that whilst specialised knowledge is essential for professional practice there is the suggestion that self consciousness (reflection) and continual self critique (critical reflection) are crucial to continued competence. Looking at this study through a social realist lens it can be seen that specific knowledge structures namely specialised knowledge (vertical) and self practice knowledge (horizontal) are both important in preparation for practice.

A similar approach to PBL is the use of enquiry based learning (EBL) that integrates two or more subject disciplines. A questionnaire-based study of 185 first year pharmacy students who had completed an enquiry based learning

exercise on pharmaceutical chemistry and the relevance of this to pharmacy practice, revealed a positive outcome to this type of approach in terms of individual learning (Sattenstall and Freeman, 2009). The students were invited to comment on their experience of EBL in addition to being questioned on specific areas such as team working and chemistry skills. Students identified that EBL encouraged them to initiate their own learning and it provided an ideal mechanism to promote integration and establish the link of pharmaceutical chemistry to a clinical context. This specific curriculum strategy also appears to address other key skills required by the healthcare professional such as information technology, presentation, interpersonal, team working and time management skills. This small scale study of EBL draws attention to some of the negative aspects surrounding the compartmentalising of knowledge into different disciplines and is of particular interest in the specific area of the integration of science and practice.

If studies such as these are looked at from a social realist perspective using Bernstein's work on knowledge relations, the relationship between vertical pharmaceutical chemistry and horizontal clinical practice appears to produce useful regionalisation of knowledge that is facing outwards to meet the needs of patients and consumers. It is significant to note that medical education uses the PBL and EBL methods widely and this type of learning emerged at a time when a report by the General Medical Council on medical education, '*Tomorrow's Doctor's*' (GMC, 1993) criticised the amount of unnecessary scientific knowledge irrelevant to clinical practice. From a Bernsteinian perspective the viewpoint expressed in '*Tomorrow's Doctor's*' can be challenged. There needs to be an acknowledgement that vertical scientific knowledge and individual,

institutional knowledge is a potent force that can be recontextualised within a challenging practice context.

Implications for vocational knowledge

Two of the key interpretations associated with social constructivism and knowledge that have implications for vocational knowledge are highlighted by Young (2008) in his book *'Bringing Knowledge Back In'*. The first issue is that there may be an 'interest-based' interpretation where particular groups may want to gain monopoly over a particular field of knowledge, for example a group of subject specialists wanting to maintain and expand their particular subject area within the curriculum. The second issue is a 'process-based' interpretation where more emphasis is given to knowledge within a particular context. In this interpretation knowledge is not seen as context free, for example a community pharmacist's acquisition of knowledge is different to a hospital pharmacist.

Young argues that these are only partial perspectives and lead to a reductionist perspective. For example the 'interest-based' interpretation ultimately leads to the question of who has the power and the 'process-based' interpretation does not distinguish the degree of 'situatedness' of different types of knowledge. In the world of pharmacy, the knowledge of a pharmacist simply checking a dispensed item for accuracy is entirely situated within the context of a dispensary and the prescription in front of him/her. By contrast a pharmacist discussing the use of an alternative medicine with a doctor uses knowledge that is not necessarily situated in this way. However, not all knowledge required is based within a situational context or within the power of different 'interest-based' groups.

Young (2008 p147) also highlights that a standards-based approach to knowledge: "*collapses the distinction between the sacred and the profane and inevitably denies learners opportunities to either generalise or envisage alternatives*". This observation is important in the context of pharmacy where an increasing use of the term 'competence' may result in a move away from the powerful resources of the inward looking singular. This lack of distinction between the sacred and profane may ultimately have a negative impact on professional status.

Another problem is that it is difficult to gain parity of esteem between academic and vocational learning. Within pharmacy education there is a clear distinction between 'academic' science and more 'common sense' practice. However, an observation of the sacred-profane distinction is that these categories are not always distinct and there is considerable overlap. Scientific knowledge is embedded in the world of work and scientific work practices are evident in scientific theory. For example knowledge of solubility of different materials (sacred) is written into a job sheet (profane) in a pharmaceutical manufacturing unit. Conversely the profane practical shortcuts used by a laboratory scientist are evident in the way that a scientific researcher approaches his/her sacred theoretical work. The implication here is that there needs to be a closer integration of vertical and horizontal elements through what Moore and Muller (2002) termed fractal divisions.

Bernstein states that "*it is important to relate the external condition of the context of the field/arena to the internal conditions of the discourse.....field and discourse are inter-related and inter-dependent*" (Bernstein, 2000 p165). An

application to education is seen within a school curriculum where segments of horizontal discourse are inserted into traditional school subjects as a means of access to vertical discourse (Bernstein, 2000 p169). For example certain practical aspects of medicines are integrated into the GCSE and A-level chemistry curriculum.

Finally, Bernstein's focus on knowledge relations rather than underlying social interests argues that it is our inwardness and our commitment to principle that will ultimately shape our practical involvement with the world and he links this notion to the origins of the professions. Young (2008) concludes that the Bernsteinian view is that knowledge has moved away from 'inwardness' leading to less favourable conditions for knowledge production and professionalism as they are currently understood. This is a useful theoretical tool that I have applied to some of the tensions that exist within pharmacy education, uncovered by this research.

Summary

Is pharmacy a region? This is a useful question to apply to this review and overall I would identify pharmacy as a region facing outward. Using a Bernsteinian approach to knowledge relations and professional identity implies that there is a need to look more closely at the regionalisation of pharmacy and how genericism can support this. The move towards regionalisation threatens pedagogic cultures dominated by singulars and this is seen in the MPharm curriculum which has traditionally focused on singulars and is currently moving towards a more integrated approach.

The recognition of pharmacy as a region is useful in describing an important characteristic of the new production of knowledge discussed earlier, that it is within the context of application (Gibbons, 1994). This notion supports the value of research within a practice setting by the experienced practitioner. It is often assumed that once a practitioner moves from practice to an academic environment that the 'cutting edge' of his/her practice skills is somehow blunted and they are no longer within the context of application. The increasing demand for pharmacy practice research and evidence base for best practice suggests a clear role for the pharmacist in the production of knowledge. Another attribute of this type of knowledge is that it is beyond the scope of a single discipline and has a distinct but evolving framework. In essence the knowledge is dynamic and can be described as "*problem solving capability on the move*"(Gibbons, 1994 p5). Within the healthcare sector there is an increased emphasis on multidisciplinary working and the pharmacy undergraduate curriculum now includes different approaches to teaching and learning that lean towards regionalisation and genericism. The production of useful knowledge associated with for example, prescribing habits of general practitioners or medicines wastage cannot be conducted in scientific isolation, but requires the input of several stakeholders and transcends the contribution of a single subject area. It could be argued that potentially the greatest contribution of a pharmacist is working towards optimum medication management. This approach involves adopting a problem solving approach to individual cases and mobilising both theoretical knowledge and health/social care agencies. I would suggest that theoretically the process of academic pharmacists working with other professionals may result in a greater awareness of knowledge and social relations and the emergence of new working knowledge.

Heterogeneity and organisational diversity are other features of this new knowledge production. Different sites of learning need to be established with strong networks of communication within a community of practice. The new knowledge production requires the participants to be more reflexive and socially accountable. Where the main focus of work is medicine as a social object it becomes increasingly important for the pharmacist to maintain strong links with the social scientist and the wider concerns of the public. The pharmacist as a practice researcher within a multidisciplinary team fits well into this framework of knowledge production. For this approach to be successful there is a need for a greater awareness of knowledge relations.

In terms of knowledge production the community pharmacist is also ideally placed to engage in a working dialogue between science and society. An example of this type of activity is the contribution of the pharmacist to public health. In a review of the involvement of the community pharmacist in public health (Anderson, 2007) the pharmacist is described as a significant player in public health. The latest government documentation on public health, '*Healthy Lives, Healthy People*' clearly indicates a more significant role for the pharmacist in the delivery of the public health agenda (DoH, 2010). This public health role highlights the pharmacist as a producer and facilitator of health education in the community and is a role that stems directly from a knowledge-based profession.

Conclusion - Key themes from the literature review

The literature review has examined three key tensions within the field of pharmacy education by drawing on theoretical perspectives from Schön, Bourdieu and Bernstein who offer different challenges to the educational researcher. The swamp of practice described by Schön portrays a conflict for the reflective practitioner between technical rationality and the challenge of ongoing reflection in and on practice. Bourdieu's field theory provides a sociological tool for considering the forms of capital and habitus of individuals within a School of Pharmacy. Field theory opens up a discussion about the divergence between scientific and practice-based members of the academic community. Bernstein's knowledge relations discourse offers a different perspective and a powerful insight into specific differences between scientific and practice-based knowledge.

Application to professional identity

Ultimately the three theoretical frameworks used support our understanding of professional identity and it is useful to apply this to the pharmacy profession. Historically the professional practice of the pharmacist was seen with more clarity when his/her specialist role was solely the formulation, compounding and dispensing of drugs. The introduction of the National Health Service and the clear separation of the diagnosis and treatment of disease by the medical profession from the supply of pre-manufactured medication resulted in a profession that has an ongoing struggle with professional identity.

The broad question: 'Is pharmacy a profession?' opens complex arguments that surround the sociological theories of the role of professions in society. A

simplistic trait analysis can be applied to the pharmacy profession but according to Dingwall and Wilson (1995) there is no consensus on what the basic traits of a profession are, so this can only be seen as a starting point for further discussion. Some of the professional traits outlined by Bissell and Traulsen (2005) in their review of theories of professions and the pharmacist include:

- Professional authority over the lay person
- Sanction by the community of the power and privilege of professionals
- Confidential nature of the professional-client relationship
- Shared ethical values regulating the profession
- The existence of a professional culture that is passed on to new entrants to the profession
- Theoretical knowledge underlying the practice of the professional

I considered each of these traits individually to substantiate the claim of pharmacy to be a profession. It can be argued that the pharmacist has professional authority over the lay person. For most patients their medical treatment involves the use of medicines and the pharmacist will be the last person in a sequence of decisions and events before the medicine is actually taken. Some may argue that the decisions have already been taken by the physician with responsibility for the case. The converse argument is that the pharmacist is the last person to intervene in the case before the medication is taken. It is the pharmacist who has the knowledge and authority to make an intervention at this critical point. The pharmacist is clearly sanctioned by the community as a person with a privileged position of trust within that community.

The pharmacist is a central and accessible person who provides a range of health related services. All members of the profession are bounded by the standards for ethics, conduct and performance which are based on principles which express the values central to the identity of the pharmacy profession (GPhC, 2010). New entrants to the pharmacy profession are subjected to the professional culture that exists within a School of Pharmacy, such as the fitness to practise procedures and the pharmacy student code of conduct, leading to the extensive socialisation process that occurs through practical pre-registration training. Increasingly pharmacy undergraduates are exposed to a range of professional issues in their studies through placement-based learning, which underlines the values that are inherent within the profession.

Theoretical knowledge underpinning the practice of pharmacy is obtained from the four year MPharm degree programme, pre-registration training and postgraduate continuing professional development. It is this theoretical knowledge and its relationship to professional practice that is the main focus of this research.

The theoretical frameworks used in this review are of increasing importance in the study of a profession such as pharmacy. Schön challenges the professional to move beyond the comfort zone of technical rationality. As professional knowledge becomes more 'commodified' Schön's study of the reflective practitioner using reflection in action provides a challenging alternative way of viewing the use of knowledge in practice. Bourdieu exposes the social dynamics of professional knowledge by using field theory to describe how agents within a field use different types of capital to gain advantage. This is

particularly useful when applied to the science versus practice debate within the MPharm curriculum. The clearer articulation of the way a professional uses knowledge is supported by using a social realist approach. Bernstein's work on knowledge relations and his vertical-horizontal discourse is a useful tool for later discussion of pharmacy knowledge and professional practice.

Research Questions

There is a lack of literature that relates specifically to pharmacy knowledge and its relationship to professional practice. The research questions developed for this study which have arisen from a review of the literature include:

- 1. What areas of pharmacy knowledge are viewed as important by pharmacy educators within different higher education institutions?**
- 2. What indicators of support are there for an increased practice-based curriculum from a sample of both science and practice-based educators?**
- 3. What constraints, influences or tensions are evident in the delivery of the pharmacy practice curriculum?**
- 4. What types of ideas, norms and beliefs about the pharmacist contribute to the development of the MPharm degree programme?**

All of the questions were developed to gain an insight from the viewpoint of pharmacy educators. The first question is very broad and seeks to understand the important areas of pharmacy education from the perspective of pharmacy educators across different types of institution. The second question aims to determine how 'practice' is viewed and how this links to an increased practice-

based curriculum. This question will utilise insights from Schön's work on reflective practice. The third question which centres on tensions within the delivery of the MPharm curriculum is examined from a Bourdieusian perspective using field theory as applied to pharmacy education. This question also provides the opportunity to apply Bernstein's work on knowledge relations, particularly the contrast between vertical/horizontal knowledge and the move from singulars to regionalisation of knowledge. The final question centres on professional identity and is used as a vehicle to apply all three of the theoretical frameworks to explore links between knowledge and professional identity. The impact of the literature review on my research design is the starting point for the next chapter.

CHAPTER 3: RESEARCH DESIGN

The first section of this chapter is a summary of the key influences of Schön, Bourdieu and Bernstein on my approach to the overall investigation (Table 3.1). The second section outlines how I developed my choices in the initial planning stage once the research questions had been established. This leads into a discussion about my interpretation of objectivity and subjectivity in pharmacy education. The final section is a critical rationale for my mixed methods approach to the research, including how the study was designed and the relationship between the different research instruments. This leads into a discussion of practical issues associated with mixed methods research and how these relate to my study.

1. Key influences of Schön, Bourdieu and Bernstein on my approach to the overall investigation.

Table 3.1: The influence of Schön, Bourdieu and Bernstein on my research methodology

Area of literature	Key themes applied to research	Summary comments
Schön	<ul style="list-style-type: none"> • <i>Tension between 'rigour or relevance'</i> • <i>How is convergent scientific knowledge used?</i> • <i>What is the context for pharmacy practice?</i> • <i>Research as a reflective conversation</i> • <i>Exploration of the 'reflective practicum'</i> 	Schön's 'rigour or relevance' debate is particularly applicable to the pharmacy profession that sees a clear distinction between 'science' and 'practice'. The reflexive diary and interview analysis both explore the relationship between technical rationality and the social context. The reflexive summaries used throughout the analysis aim to address what Schön describes as a lack of reflective conversation with the situation.
Bourdieu	<ul style="list-style-type: none"> • <i>The interface between theory and practice</i> • <i>Types of capital</i> • <i>Fields and habitus</i> • <i>The logic of practice</i> 	The methodology recognises Bourdieu's view that practice and theory are mutually dependent. I have focused specifically on agents labelled as having a strong 'science' or 'practice' disposition and investigated their mode of operation within the pharmacy education field.
Bernstein	<ul style="list-style-type: none"> • <i>Describing knowledge using the vertical horizontal discourse</i> • <i>An exploration of knowledge relations across 'science' and 'practice disciplines</i> • <i>Consequences of regionalisation of knowledge on teaching and learning</i> • <i>Exploration of professional identity in relation to respondent perception of knowledge</i> 	The perception of individuals about relationships within a School of Pharmacy is a key part of the investigation. The interviews examine the tension between vertical knowledge aligned to the individual and the horizontal knowledge of the community. This research aims to look for the interchange between the reservoir of the community and the repertoire of the individual within a School of Pharmacy.

2. Developing choices on my research journey

During the initial planning phase I became aware of two major issues that would impact on my research design and moved my thinking towards a more constructivist stance.

1. Pharmacy education is essentially delivered by two types of educator: the scientist and the pharmacy practitioner. Whilst it is appreciated that the scientist is also a practitioner, the common terminology already described within pharmacy education is a dichotomous split between 'pharmaceutical science' and 'pharmacy practice'. From my own experience it is clear that these two types of educator view the world of pharmacy differently and this resulted in a closer examination of what the commonly used terms 'science' and 'practice' mean in an educational setting and how this relates to the debate about the terms objective, subjective and intersubjective knowledge. Occasionally members of the pharmacy academic community have their feet in both camps in that they are pharmacy practitioners with an academic scientific background or pharmaceutical scientists who are also practising pharmacists. This hybrid educator is unusual but I took this into account when designing my research.
2. I did not want to ignore my personal history or my centrality to the research questions. This directed me towards a reflexive narrative approach which has become integral to my research design and has been discussed in the introduction in Chapter 1.

What is meant by objectivity and subjectivity in pharmacy culture?

A statement in the *British Medical Journal* highlights the stereotyped view of objectivity within medicine and pharmacy:

“Clinicians and pharmacists are taught to think that subjectivity is “woolly”. This leads to a desire to quantify all relevant considerations in a formula in the belief that this somehow makes things objective.” (Donaldson, 1994)

In the world of pharmacy objectivity is often equated to all that is viewed with a scientific label. For example the ultimate goal of a ‘scientific’ investigation is that it is free of bias and personal prejudice. The scientific background of pharmacy is entrenched in its history and closely related to its power as a profession. My impression is that this scientific core is viewed as objective and other areas such as the social issues relating to pharmacy practice are seen as the ‘fluffy edges’ and given the label subjective. A clear contrast would be made for example between the scientific objective principles of formulating a medicine as opposed to the non-scientific subjective social issues surrounding the actual taking of the medicine by a patient. This can lead to a more shallow and dismissive approach to the social issues by limiting this area of enquiry to surface descriptive method rather than a deeper analysis. It could be argued for example that in terms of outcome, the reasons a patient may not take his/her medicine (seen as subjective) is at least of equal status to the scientific principles (seen as objective) that are used to formulate the medicine in question.

The objectivity-subjectivity debate is a key area within pharmacy education as the discipline of pharmacy practice has gathered momentum and displaced some of the scientific content of the undergraduate pharmacy curriculum. In my

experience as a pharmacy educator there is some academic criticism of the increase in pharmacy practice curriculum content as it is viewed as a subjective area based on personal opinion or intersubjective based on the agreement of a group of practitioners.

The opposite view is that if practitioners with their individual subjective approach or collective intersubjectivity within different locations of practice communicate effectively then something resembling objectivity could be worked towards. The domain of practice is intersubjectivity rather than subjectivity which is essentially individual and private. These domains are symbiotic in that the subjective (individual) feeds the intersubjective (community) which in turn influences the way that the objective (world) is experienced. Within the world of pharmacy education scientists and practitioners are commonly viewed as separate species. This in itself is an important observation as scientists are also practitioners (of science) and have their own intersubjective community.

Clinicians and pharmacists are encouraged to prioritise scientific knowledge as this is seen to be highly objective. It is possible that this may influence their view on all forms of knowledge, including social knowledge. However, the basis of science is observation and all observation is ontologically subjective. The direction of travel from subjectivity to objectivity can be through the intersubjective agreement of a community of peers, using established rules and norms for agreeing the validity of truth claims. A starting point in my methodology is to identify the two species of educator defined by 'science' and 'practice', who on the surface appear to view pharmacy education differently. My research design attempts to unpick this dichotomy. The pharmacy undergraduate programme is treated as a science degree rather than a clinical

qualification as described by Wright et al.(2006). My impression is that this emphasis has resulted in a formulaic approach to the curriculum and professional practice.

A good example of formularising in practice is the use of the principle of evidence-based medicine. This approach, which is often seen as the gold standard in terms of informing medical practice, can be limited. Many clinicians are now critical of the emphasis being placed on 'the evidence' and concerned that clinical practice will become more constrained (Williams and Garner, 2002). An increased emphasis on objectivity may ignore and oversimplify the complex and interpersonal nature of clinical care. A recent example from the medical literature is a study that explored the relationship between prescribing guidelines (objective) and the patient partnership with the prescriber (intersubjective). The research concluded that rigidly applied guidelines can limit patient choice and may damage the doctor-patient relationship (Solomon et al., 2012).

Historically it was thought that the practice of medicine and allied professions involved knowledge that was too objective and technical to be understood by the sociologist. It was not until the publication of the Goodenough Report (1944) that there was an impetus to include sociology and other social sciences within the medical curriculum. The sociology of medicine progressed significantly as medical sociologists started to develop new models of healthcare that moved away from the traditional perspective of the medical profession (Annandale, 1998). I would suggest that within pharmacy education there is a need for a similar emphasis in pharmacy practice. At the outset one of the clear methodological choices I made was to engage with the science versus

pharmacy practice divide by exploring how different players in the academic pharmacy field view this objective-subjective-intersubjective division.

3. Rationale for mixed methods approach

Greene (2006) describes how the use of the word 'methods' within mixed methods research must be viewed broadly and applies to the researcher's methodology and not just the methods of research. This implies that any discussion of mixed methods research must incorporate my assumptions, values and philosophy. A useful starting point is to define what is meant by mixed methods research. Johnson et al. (2007 p129) conclude their article on different definitions of mixed methods with an overall definition as *"an intellectual and practical synthesis based on qualitative and quantitative research; it is the third methodological research paradigm (along with qualitative and quantitative research)."* Four of the key issues associated with a mixed methods research paradigm discussed by Johnson et al. (2007) are that the research:

1. Partners with the philosophy of pragmatism.
2. Follows the logic of fundamental principles imported from qualitative and quantitative methods.
3. Relies on quantitative and qualitative viewpoints that are combined according to the logic of mixed methods research to address research questions.
4. Is cognizant and inclusive of local and broader socio-political realities, resources and needs.

In the discussion of my mixed methods research I will discuss each of these four issues.

Firstly my rationale for using this approach is that it fits in with a pragmatic worldview as it values both objective and subjective knowledge, uses diverse approaches and is based on the question 'what works?'. Tashakkori and Teddlie (2003) clearly link pragmatism to mixed methods research and have highlighted the following issues:

- The researcher can use both quantitative and qualitative methods in a single study
- The research questions are of overriding importance and must take a more important position than either the method or the philosophical worldview that underlies the method
- The forced dichotomy between post-positivism and constructivism should be discarded
- Metaphysical concepts such as 'truth' and 'reality' should be abandoned
- A practical and applied research philosophy should guide methodological choices

In my research it is practical to combine a quantitative and qualitative approach in a single study rather than see these as separate components. The rationale for the sequencing of the different components is discussed later in this chapter. The four research questions used for this project stem directly from key issues that have arisen from my experience of pharmacy education and are viewed as fundamental to the design of the research. Using a combination of quantitative and qualitative approaches releases me from the stark choice between post-

positivism and constructivism. I view this as being particularly relevant to the field being investigated, which incorporates theory (science) and practical application. Terms such as 'truth' and 'reality' have been intentionally avoided in my narrative as they assume that there is a simple truth/reality for the field of investigation. Instead I have aimed to uncover the truth/reality for individuals (including myself) within the field. My research project is both practical and applied as it relates to pragmatic questions that impact on the delivery of the MPharm curriculum.

Secondly the logic of fundamental principles of both qualitative and quantitative research is evident within my research project. In their text on designing and conducting mixed methods research Creswell and Plano Clark (2007) contrast the different features of quantitative and qualitative research methods. For example the intent of the research using a quantitative method is to support or refute theory whereas a qualitative study is to understand meanings individuals give to a phenomenon inductively. In my research there is a sense in which the questionnaire study is seen as an initial exploration rather than testing a theory. However the questionnaire study does have a specific agenda as it quantitatively contrasts the science versus practice viewpoint of different types of educator. One view of the contrast between quantitative and qualitative research expressed by Creswell and Plano Clark (2007 p28) is that quantitative and qualitative methods should not always be viewed as direct opposites but placed on a continuum. A mixed methods approach encourages this type of thinking and my research project draws quantitative and qualitative elements together but relies on the basic principles used by both types of method.

Thirdly there is a logic of mixed methods that can be applied to my research project. As a result of studying a range of mixed methods studies Creswell and Plano Clark (2007 p32) suggest four needs that tend towards the logic of a mixed methods approach. The first need is that a qualitative or quantitative approach alone is inadequate and mixed methods provide a more complete picture. In my research the questionnaire alone is limited as it only provides untested trends and generalisations. An in depth insight into individual perspectives provided by the interview narratives is needed to test, balance and expand the generalisations from the questionnaire study. By using a combination of a questionnaire, interviews and a reflexive diary I overcome the lack of confidence that the problem has been explored in sufficient depth which can be apparent when using one method alone. The combination of different methods also provides the opportunity to clarify subtleties and conflicts in the data. The second need is that the initial study should be enhanced with a second source of data. In my research the initial questionnaire study informed the recruitment process for the interviews and supported the development of the interview schedule. This means that a secondary data source was used to confirm or refute the initial findings. The third need for mixed methods is that the results of a quantitative study are inadequate to provide an explanation of outcomes and the researcher needs to enrich and explain the quantitative results in the words of the participants. The results of my questionnaire study summarised in Figure 5.1 are further developed in the interview study and reflexive summaries. The fourth need expressed by Creswell and Plano Clark (2007) does not apply to my research as they suggest a qualitative investigation could be carried out first to develop theories that could be subsequently tested using a quantitative approach. In my research project I did not make this

methodological choice as I am close to the field and therefore aware of some of the major themes that needed further investigation. This approach would be more suitable for a researcher who is not familiar with the area of focus.

The fourth issue of a mixed methods paradigm is that the research incorporates an awareness of socio-political issues. In my research the interviews and reflexive diary helped to unravel some of the wider issues in this research field. For example the interviews included respondents from three different types of institution and identified cultural issues such as the application of an institutional 'label' that would not be evident from the questionnaire study. The reflexive summary work derived from my ongoing reflexive diary identified political issues such as the use of specialised language within practice to maintain professional status. Having examined four ways in which my research is aligned to a mixed methods approach I now explain the specific design that was applied to the research problem under investigation.

Design of mixed methods study

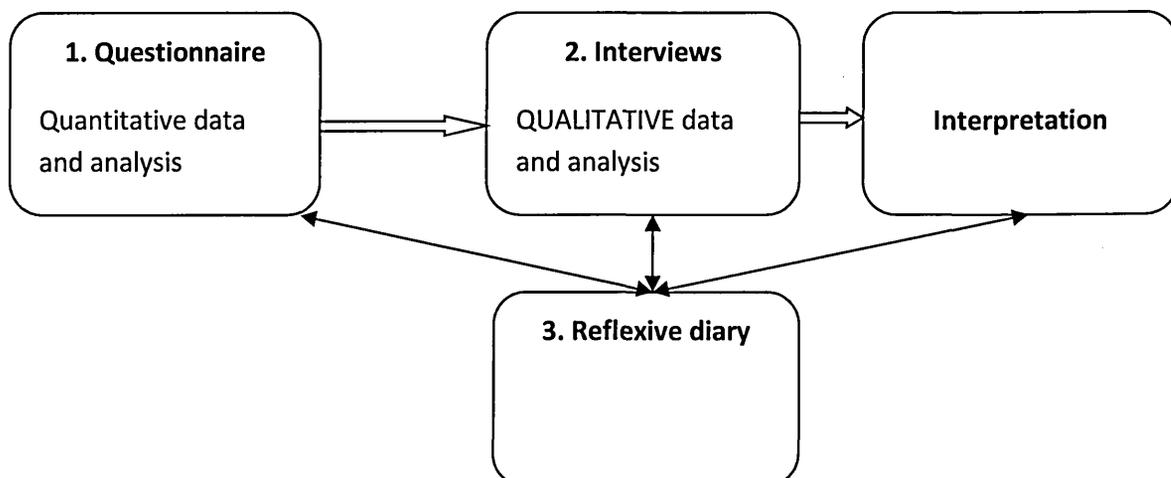
The three components of my mixed methods study included:

- An initial questionnaire study that requested the views of academic members of staff working at different Schools of Pharmacy
- Semi-structured interviews of selected members of staff from different types of School of Pharmacy using the results of the questionnaire study to inform the interview schedule
- An ongoing reflexive diary that was used as a source of summarising and clarifying my findings

In this section I describe and justify the three components used in my mixed methods study and how they are ordered within the research process. Creswell et al. (2008) discuss different types of mixed method designs and distinguish between concurrent and sequential studies. Concurrent studies involve the parallel collection and analysis of data from different studies before merging to provide a more complete picture. Sequential studies involve the collection of qualitative and quantitative data in different phases and connecting these in different ways. My research uses a sequential explanatory design as described by Creswell et al. (2008 p68). The first phase is a quantitative questionnaire study which is then followed up by a qualitative interview study leading to an interpretation that incorporates both studies. The study design is shown in Figure 3.1 which is an adaptation of the diagram used by Creswell et al. (2008 p68). The variation I used in this explanatory design is the addition of a reflexive diary as a third component which links into the follow up of the quantitative data, the analysis of the qualitative data and the overall interpretation of the research.

Figure 3.1

Design based on sequential explanatory design showing relationship of research components



Rationale for the three components used

Questionnaire

The rationale for the questionnaire is that I wanted to test out my guiding personal constructs across a large sample of academics, both scientists and pharmacy practitioners from different Schools of Pharmacy. This was mainly a quantitative study where data gathered would focus on the views of pharmacy educators with specific reference to:

- their interpretation of what areas of pharmacy knowledge are important for future practice
- curriculum issues that relate to the integration of science and practice
- the level of support for a more practice-based curriculum

Respondents were also invited to make additional comments in response to more open questions. The main purpose of the questionnaire was to look for any differences that exist between institutions and different academic disciplines with particular reference to 'science' or 'practice'. The questionnaire was designed as an important formative stage and was key to the development of my interview schedule and approach. The advantage of using a questionnaire was that I was able to access responses from a large number of respondents over a wide geographical area. The data were captured over a short time period and unlike an interview there was no variability in questions asked or specific bias from the presence of an interviewer. The disadvantages of this initial questionnaire phase included: the questionnaire needed to be short to ensure a reasonable response rate, some questions were not answered and it was not possible to explore specific responses in more depth. During this initial stage I was testing out my own constructs before I entered the interview phase.

The main purpose of the questionnaire was to make some generalised statements across six key themes already identified from the literature review, my own background and reflexive diary. The six themes included:

- A scientific identity
- The integration of science and practice
- An increased practice-based curriculum
- The MPharm as a wider education rather than a training programme
- The ease of MPharm development
- The application of pharmacy knowledge

These themes were matched against institution type, pharmacists and non-pharmacists, physical and biological scientists, scientists and practitioners, teaching, research and management roles. This information was used to support the selection process for respondents for the interview study. The selection of respondents was based on obtaining a balance using fixed data such as type of institution, gender and subject discipline. However an important part of the outcome of the questionnaire phase was to also identify respondents who presented divergent views across the science-practice spectrum and the six themes identified.

Interviews

The purpose of the interviews was to see how well the questionnaire data is reflected within the interview narratives. The interview stage focused more on the research question: what types of ideas, norms and beliefs about the pharmacist contribute to the development of the MPharm programme? The semi-structured interview schedule was finally developed after analysis of the

questionnaire, which was also aligned closely to my methodological work on reflexivity. As the interviewer I found it useful to constantly think about my own position in relation to the respondent and used reflexive summaries from my ongoing research diary when I discussed the interview findings. The main advantage to conducting the interviews was that I was able to explore the substantive area with respondents in the field and examine my own position more closely.

Reflexive diary

The main purpose of the reflexive diary was to address my positionality within the field and gain an insight into the influence of both my background and my current role. The use of an ongoing reflexive diary also fits well with Bourdieu's emphasis on methodological reflexivity. A study on the application of mixed methods research to complementary and alternative medicines states that an important challenge of mixed methods research is to turn the methods of constructing the research back on the researcher, to produce a more accurate understanding of the social world (Fries, 2009). The quantitative questionnaire study focuses on specific perceived themes or structures within the pharmacy education field and assigns a scale of magnitude to these themes. By direct contrast and in tension with, the qualitative interview study examines individual viewpoints and perceptions. The bridge of interpretation is the reflexivity of the researcher which is the interplay between these two domains. The interpretive vehicle used for my study was the reflexive diary.

The sequential explanatory design as described by Creswell et al.(2008 p76) identifies three areas of discussion that can be applied to my own research design: sampling, respondent selection and contradictory findings.

The quantitative and qualitative sample sizes are unequal due to the nature of the methods used. The questionnaire study involves a large number of responses whereas the in-depth interview study involves a relatively small sample of respondents. However the sample size does not need to be equal as they are not being compared directly (Creswell and Plano Clark, 2007). My strategy for the sampling process was to use a subset of respondents from the initial quantitative phase. This is in line with explanatory design where the interviews (second phase) are used to support my understanding of the questionnaire study (first phase).

For the respondent selection process there can sometimes be ethical challenges where complete anonymity is required from the first phase and the respondent is unable to give his/her identity if they are interested in the interview study (Leahey, 2007). In my study the results for both the questionnaire and interviews are reported anonymously. However in order to access volunteer respondents for interview it was necessary for the respondent to add identification details to the questionnaire response. There were no ethical issues identified by using this process as the type of information revealed in the questionnaire is not of a personal or sensitive nature. Respondents for the interview were selected using the responses on the questionnaire. There is a small possibility that some respondents may have wanted to volunteer for interview but did not want to have their questionnaire responses identified. This

potential problem should be considered in this type of sequential mixed methods study.

Contradictory findings also need to be investigated where the data from the quantitative and qualitative phase is inconclusive or in opposition to each other. Creswell et al. (2008 p78) suggest that a strategy for addressing conflicting findings in sequential studies is to draw attention to differences and problems and open up a discussion on new avenues of research required. This may involve the later implementation of a new phase to the research. Overall in my research project there was a natural progression from the questionnaire summary of findings through to the interview data collection and analysis. It would have been useful to have collected more qualitative data using focus groups but this was not practical within the time constraints of the project. This observation leads to the discussion of other practical issues associated with a sequential explanatory mixed methods design.

Practical issues

One of the practical issues associated with a mixed methods design that uses both quantitative and qualitative methods is that ideally the research should be team-based rather than carried out by an individual. This allows the project to draw on the expertise and insight of a team rather than expecting a range of techniques from an individual researcher. Another practical problem associated with a sequential design is that it requires a long period of time to collect and analyse data. As my research project is an individual piece of work I had to work within this constraint and the project timeline was planned accordingly. I found it helpful to be guided by the research questions for the overall synthesis

and integration of the data and ongoing analysis. The first three research questions relate more clearly to the questionnaire study whereas the fourth research question can be applied more readily to the interview study. A key practical issue that needs to be resolved with mixed methods research is the degree of importance allocated to each phase of the study. For this research I attached greater importance to the qualitative study as ultimately it was through a dialogue and interaction with others that I gained a clearer understanding of this area. To use a pharmaceutical metaphor I viewed the quantitative phase as the assembly of raw materials and the qualitative phase as the manufacturing process of a complex product. The important part of the project is the actual formulation process and subtle ways of production where the product (research outcome) is shaped and comes into view. However if there are problems with the raw materials or the way these are lined up for the production process then this will also impact on the final product. The insight and ongoing reflexivity of the operator is also vitally important throughout this process and this is why the use of my reflexive diary as a research instrument was essential for my mixed methods design.

Creswell and Plano Clark (2007 p72) state that for a sequential explanatory design which starts with a quantitative phase the investigators typically put more emphasis on the quantitative rather than the qualitative methods.

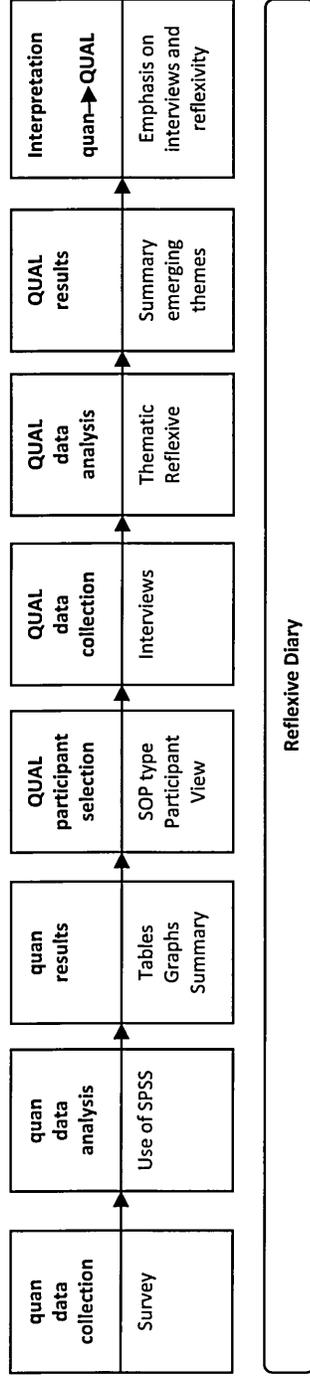
However, in my study the reverse is true and this was also compounded by the influence of maintaining a reflexive diary throughout the entire process. One variant of the explanatory design model that fits in with my approach is the participant selection model where the researcher needs the quantitative information to identify and purposefully select the participants for forming the

qualitative study. Figure 3.2 shows an adaptation and more detailed flow chart of the explanatory design: participant selection model to illustrate my own research design. This model emphasises the qualitative phase as denoted by the 'QUAL' in capital letters and the 'quan' in lower case letters (Creswell and Plano Clark, 2007 p73). For my research a distinct advantage of the explanatory design is that there are two distinct phases that can be reported separately. A disadvantage of this design is that there is some uncertainty when starting the investigation about participant selection for the qualitative phase as this is dependent on the data collected from the first phase.

One of the terms used in the mixed methods research literature is data transformation and there is a distinction between 'qualitized' and 'quantitized' data outlined by Teddlie and Tashakkori (2003 p9). My research process is aligned to a 'qualitized' process where quantitative data from the questionnaire is converted into narratives that can be analysed qualitatively. This is in contrast to the term 'quantitize' as used by Miles and Huberman (1994) where collected qualitative data types are converted into numerical codes that can be statistically analysed. With the exception of my analysis of the written comments on the questionnaire I have followed a qualified data transformation process.

Fig 3.2

Adaptation of Explanatory Design: Participant Selection Model



Summary

A useful question to ask about any mixed methods research is if the investigation enhances our understanding of the research problem. Bryman (2008 p87) expresses a concern about mixed methods research literature where the specific mechanism for the mixing, integrating, combining and meshing of data is often under-explained. Bryman (2008 p88) gives three reasons for this lack of explanation. Firstly it can be difficult to work out from a study what quantitative and qualitative components were used in conjunction with one another. Secondly we do not have an agreed language to discuss mixed methods research and there are differences in the way that terms are used within the mixed methods field. Finally it is not entirely clear what is involved in bringing the quantitative and qualitative phase together.

These criticisms imply that researchers find it difficult to engage in agreed good practice and focus on their own justification where there is an emphasis on individual components rather than a sum of its parts. To defend my own study against this type of criticism I have explained the relationship between the different phases of my research in Figures 3.1, and 3.2. The results and analysis of the questionnaire study summarised in Chapter 5, Figure 5.1 were used for both selection of respondents and in the development of the interview phase. This resulted in further emergent themes from the qualitative phase which contributed to my overall findings. The ongoing reflexive diary has been vital at all stages of the project and particularly the use of a reflexive summary

process to consolidate my conclusions. The research questions have related to both different phases and to the sum of the entire research process.

I consider that using a mixed methods approach for this study has had three distinct advantages. Firstly, one of the major advantages of mixed methods research is that potentially it enables the researcher to simultaneously answer confirmatory and explanatory questions and therefore verify and generate theory in the same study (Teddlie and Tashakkori, 2003 p15). For example this research project could be considered as having two stages:

Stage 1: Will a 'science' or 'practice' perspective affect the view of the MPharm curriculum? This has been investigated widely across different Schools of Pharmacy using a questionnaire.

Stage 2: Exploration to follow up any perceived relationship from Stage 1. The interviews have enabled a deeper investigation of specific respondents.

Secondly, there is a fundamental principle of mixed methods research which states that the sum of different research methods is greater than the individual components, which potentially leads to stronger influences (Johnson and Turner, 2003 p299). The questionnaire study, interview study and reflexive diary when viewed together provide greater insights into the overarching research questions rather than different ways of researching the same area.

Finally mixed methods research allows for the presentation of divergent views and alerts the researcher to the possibility that the issues are more multifaceted than they may have originally supposed (Deacon et al., 1998). In this research

the reflexive summary of each theme aims to take into account differences and divergence within the findings.

Throughout the study I have taken the view that the different methods used are only partial views and the aim has been to examine tension and diverse perspectives where these have arisen. For example a comparison of different types of School of Pharmacy using a questionnaire may show specific differences in viewpoint of pharmacy educators. The interview study may or may not confirm these differences. It is my reflexive summary that aims to bridge the gap and draw the methods into a coherent form. In his book *'After Method – Mess in social science research'* Law (2004) describes how in order to broaden method and to subvert it with a new way of thinking, there is a need to move away from the idea that proper methods result in healthy research. He speaks about the value of breaking traditional methodological habits including the desire for certainty and security. The mixed methods used in this research support the exploration of the complex and fluid field of pharmacy education.

Ethical considerations

An application for ethical approval was submitted to both Sheffield Hallam University and to my employer De Montfort University. Permission was granted by both institutions and a copy of the approval letter can be seen in Appendix 1. The main ethical considerations are outlined in Table 3.2.

Table 3.2: Main ethical considerations for the research project

Ethical consideration	Action taken
Confidentiality	<p>Names of any participants and any identifying characteristics were made anonymous. Results are only presented as part of the EdD submission and any associated publication.</p> <p>All data was managed in accordance with the Data Protection Act. This means that all electronic data (both audio files and text files) were stored on a PC that was password protected; all hard copy of data was stored in a locked filing cabinet within a locked office at De Montfort University.</p>
Participant consent and right to withdraw	<p>Voluntary participation was outlined in the letter of introduction inviting participation in the questionnaire. (Appendix 2)</p> <p>The interviewee was given a letter of introduction that outlined the right to withdraw at any stage. Written confirmation from the participant that they consent to interview was obtained as a reply section of this letter. (Appendix 3)</p>
Negative consequences of participation	<p>Some of the research involved work with colleagues. However, the broad subject areas covered were not considered to be sensitive or controversial so there were no specific negative consequences of participation.</p>

The work plan was divided into three phases:

Phase 1: Questionnaire

Phase 2: Interviews

Phase 3: Ongoing reflective work

Phase 1: Questionnaire

The focus of this initial phase was to collect questionnaire data from academic staff involved in the delivery of the MPharm undergraduate programme. The questionnaire focused on the views of pharmacy educators with specific reference to research questions 1,2 and 3, (see Chapter 1). A self-administered questionnaire was developed using a Likert scale associated with a series of 15 statements. The questionnaire also provided the opportunity for respondents to write free text responses to a further three questions.

Administration of questionnaire

Following piloting of the questionnaire and after the adjustments detailed in Table 4.1 that relate to question clarity and interpretation, 491 questionnaires were sent out by post to all members of academic staff within 12 selected Schools of Pharmacy (SOP) located in England, during November 2010. The names and contact details of members of staff were obtained from SOP websites. Each SOP was selected to provide a balance between three different types of School:

- New SOP with a recently introduced MPharm programme designated 'N'

- SOP where the main emphasis is on teaching (post-92 University) designated 'T'
- SOP where the main emphasis is on research (established University) designated 'R'

A summary of the number of questionnaires sent out to each SOP and the total sent out to each type of SOP can be seen in Chapter 5, Table 5.1. A questionnaire was sent to all academic staff involved in the teaching of the MPharm course in each selected SOP unless it was clear from their role details on the SOP website that they were not involved in the MPharm programme. The package sent to each potential participant included: questionnaire (Appendix 4), covering letter explaining the research (Appendix 2) and a prepaid reply envelope. All of the questionnaires were coded with a number from 1 to 491 (matched to a list of names within the sample) for the purpose of finding out which members of the sample group had replied. After two weeks any members of the sample group who had not replied were approached again with a reminder letter, replacement questionnaire and prepaid envelope. The numerical coding of the questionnaires was only used for management of the follow up process to increase the response rate. After a further 2 weeks all of the returned questionnaires were collated and data recorded using the software Statistical Package for Social Sciences (SPSS).

Phase 2: Interviews

The focus of this phase was the completion of 12 semi-structured interviews with four members of staff from three different Schools of Pharmacy. As part of

the questionnaire for three of the Schools (SOP: 1, 6 and 10 - see Table 5.1) there was a section where the respondent was invited to indicate their willingness to participate in a follow-up interview. These three Schools were selected as they were representative of the N, T and R type of SOP. From the 29 volunteers for interview, four respondents were selected from each of the three institutions on the basis of: providing a balance between science and practice-based members of staff, gender balance and contrasting issues that emerged during the questionnaire phase that I wanted to explore further. All selected volunteers were contacted with a letter and participant information that provided full details of the interview process (Appendix 3).

The semi-structured interview schedule (Appendix 5) was designed and developed to provide a greater insight into my fourth research question: *What types of ideas, norms and beliefs about the pharmacist contribute to the development of the MPharm programme?* The aim was to gain a deeper understanding of pharmacy knowledge in relation to professional practice. Issues that arose from curriculum-based issues of the Phase 1 questionnaire study were included within the interview schedule. Each of the 12 interviewees participated in a semi-structured interview during May and June 2011, that explored their individual response to the questionnaire and themes from the overall questionnaire responses. The interviews were all recorded using a digital voice recorder (Olympus VN-5500PC). All interviews were held in a private area at the institution of the interviewee and were between 45 minutes to one hour duration. A summary of the type of institution and interviewee profile is recorded in Chapter 6, Table 6.1.

Questions were drawn from six different domains. As the conversation progressed the domains were ticked off a matrix as the topic was covered either by the interviewee or by my questions. The six domains covered in the interview schedule were:

- Individual background issues
- Pharmacy as a knowledge-based profession
- Integration of the curriculum
- Scientific identity of the pharmacist
- Increasing the practice component of the curriculum
- How a pharmacist is viewed

Phase 3: Ongoing reflexive work

Concurrently with Phases 1 and 2, I maintained a reflexive research diary throughout the research process. This involved personal reflection on the research questions and engagement with the data collected to provide a personal input so that as a researcher I was able to use a constructivist approach to the research questions. This process was designed to support my interpretation and discussion of the findings presented in Chapters 5 and 6.

Development of research instruments

Questionnaire

The questionnaire was piloted in my own institution on six academic members of staff (three pharmacy practice-based and three pharmaceutical science-based). Following completion of the questionnaire a full discussion took place

with each of these members of staff and any suggestions or amendments were considered when constructing the final version of the questionnaire. The main issues that emerged during the piloting of the questionnaire were related to language and interpretation of statements. Some selected examples of questionnaire statements modified as a result of the pilot work are summarised in Table 4.1

Table 4.1: Examples of questionnaire development

Pilot statement	Revised statement	Rationale
The pharmacist should be thought of as principally a scientist.	The pharmacist should be thought of as primarily a pharmaceutical scientist.	Lack of understanding of the word principally in this context.
The MPharm degree should be viewed more as a broad education rather than training for a future role in practice	The MPharm degree should be viewed more as a broad education rather than training for a future role in community, hospital or industrial practice.	The statement needs to be more specific.
The MPharm programme should focus more on competence- based outputs that are linked to professional practice.	The MPharm programme should focus more on competence-based outputs that are linked to professional practice rather than pharmaceutical science.	The statement needs some contrast with pharmaceutical science.
There are many constraints that hinder me from the creative development of the teaching of my subject area.	It is difficult to creatively develop the teaching of my subject area on the MPharm programme.	The meaning of constraints is unclear as this could refer to resources whereas the revised statement attempts to gain some insight into creative development of specialist subject area.

The introductory statement for the questionnaire was changed so that it was clear to respondents that I was looking for the respondent's immediate or instinctive response to each statement.

Interviews

Two pilot interviews were carried out for a small scale pilot project in July 2009. The interview schedule was then further developed from the pilot study, field notes and comments from colleagues, before commencing the formal interview phase of this research.

The theory of communicative action as described by Habermas is critical to my understanding of the interview dialogue and my input into the research process when exploring the view of academic members of a School of Pharmacy. The research interview has been described as a "*conversation with a purpose*" (Kahn and Cannell, 1957 p149). This simple but useful definition provides some insight into the difficult balancing act between an informal and comfortable conversation with a colleague and the achievement of a focused interaction that generates useful data. Listening to the audio recordings of the pilot interviews, one criticism is that both interviews had an intimate conversational tone that was somewhat stilted by the interview schedule. In some ways the conversational nature of the interview was its greatest strength and it is possible that as the interviewer I attempted to bring too much focus which did not have the desired effect. This is one of the critical areas of qualitative research in that the participant's perspective on the phenomenon of interest "*should unfold as the participant views it, not as the researcher views it*" (Marshall and Rossman, 2006 p101).

On a positive note I feel that the conduct of the interview was such that the interviewee was able to express personal views in an atmosphere that was conducive to listening where their views were respected and given space. I

think this is important for any piece of qualitative research that involves interviews. The success of the interview depends to a large extent on the quality of the personal interaction. In the pilot study there was no hierarchical relationship between myself and the interviewee which could have had a potentially negative inhibitory effect on how the interviewee expressed their views. However, even in a conversation with a colleague there can be a problem of expression of views, as by normal polite convention most people would not want to appear unduly negative. For example in one of the interviews the participant expressed the opinion that the pharmacist had a complementary role with other healthcare professionals but then later stated that the pharmacist is not well integrated in the team of healthcare professionals within a hospital. It was only after some gentle probing for elaboration on this statement that the participant stated that they thought the relationships within a hospital setting were hierarchical, but appeared somewhat reluctant to state what could be interpreted as a negative view of their own experience.

Reviewing the pilot interview notes I can see areas where my own views may have prejudiced the course of the interview. For example, one participant expressed an opinion about the way that dispensing is taught within the programme as *“too focused on the process and not so much on the quality of the interaction with the prescriber and patient”*. I was in strong agreement with this observation and as I have responsibility for this curriculum area found myself again distracted by the statement, resulting in excessive agreement with the participant. Overall, I feel that the pilot interviews underlined the need for a clearer self assessment of my own views, so that I am more aware of specific

areas in the interview where my own views may obstruct the development of the views of the participant.

Methods of data analysis: Questionnaire

Stage 1: General data

All of the data from the 197 questionnaires received were entered into a file using SPSS software. General respondent profile information such as gender, age and subject area was generated about the sample group (Chapter 5, Tables: 5.2, 5.3, 5.4, 5.5).

Stage 2: Likert scale responses

As part of the development process for the questionnaire a rationale document (Appendix 6) was produced to show the relationship between the statements with a Likert response scale and the themes suggested by the research questions. The main themes from the questionnaire were:

- The scientific identity of pharmacy and the pharmacist
- The integration of pharmaceutical science and pharmacy practice in the curriculum
- An emphasis on a practice-based curriculum
- The MPharm as a wider education (in contrast to specific training)
- The ease with which the MPharm programme can be developed
- The application of pharmaceutical knowledge

The percentage of respondents who responded on each part of the Likert scale was tabulated and expressed as a series of themed graphs. (Chapter 5, Stage 2, Graphs: 5.1 to 5.15)

Stage 3: Comparison of themes with respondent variables

Using SPSS the following respondent types (variables) were matched and coded against the themes described above in stage 2.

- Type of School of Pharmacy (SOP) according to the 3 types: mainly teaching (post-92 universities) (T), new Schools of Pharmacy (N) and research-based institutions (R)
- Pharmacists (P) and non-pharmacists (NP)
- Subject area: pharmaceutical chemistry/pharmaceutics (physical science) (PHYS) pharmacology (biological science) (BIO) or pharmacy practice (PP)
- Role of respondent as mainly teaching (T), mainly research (R), or mainly management (M)

Calculation of Likert responses

Using SPSS a value was assigned to each statement response as below:

- Strongly disagree (SD=1), disagree (D=2), neither agree/disagree (N=3), agree (A=4) and strongly agree (SA=5) respectively.
- The mean score was calculated for each statement by adding all the assigned values (1-5) for each statement and dividing by the number of respondents who answered the statement.

- For statements 2, 9 and 11 it was necessary to reverse the values as disagreement with the statement is pro the theme. (SD=5, D=4, N=3, A=2, SA=1)

For example Statement 2 (*Students should have a broad foundation in pharmaceutical science before any pharmacy practice teaching is introduced*) is about the integration of science and practice but a strongly agree answer (5) would suggest a negative response to integration and the value is therefore transposed to (1).

- The average value for each statement was then added together with statements that have a similar theme. This process assumes equal weighting and value to each item. This approach is not a claim to objectivity but has been used to signal potential differences across different groups of respondents.

Examples

Statements 1 and 5 both relate to the theme of scientific identity. As this theme involves 2 statements a SA would be $5 \times 2 = 10$ (maximum score), a neutral or N statement would be $3 \times 2 = 6$ and SD would be $1 \times 2 = 2$
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Statements 2,6,7,8 and 14 relate to integration of science and practice. As this theme involves 5 statements a SA would be $5 \times 5 = 25$ (maximum score), a neutral or N statement would be $3 \times 5 = 15$ and SD would be $1 \times 5 = 5$
--

A series of 6 graphs (Graphs 5.16, 5.17, 5.18, 5.19, 5.20, 5.21) were produced that represent each theme against the different types of respondent variables, where the y axis represents the numerical value on the Likert scale (as described in the above calculation process). Table 5.6 in Chapter 5 provides a summary of the overall management of the data during this phase. The numerical values are summarised in Appendix 7.

Stage 4: Initial summary of the questionnaire data and investigation of further variables

During this stage I summarised the main findings from the Likert style statements and used SPSS to determine if other variables such as respondent gender influenced my findings. This was a way of cross-checking my initial summary of the questionnaire data.

Stage 5: Analysis of free text comments

The three questions on the questionnaire where respondents were invited to write their own response are stated below:

Question
<i>What in your view is the MPharm degree for?</i>
<i>What in essence is the main role of the pharmacist?</i>
<i>Any further comments on your answers? Please feel free to expand or qualify any of your responses in the above section.</i>

All of the responses were read a number of times before assigning one main code to the theme of the respondent statement. Where the response raised a number of issues, the first or main issue mentioned was assigned a code.

The number of codes were then treated quantitatively and tables with example comments, themes and graphs were generated (Chapter 5: Tables 5.8, 5.9, 5.10 and Graphs 5.22,5.23,5.24)

Methods of data analysis: Interviews

The interviews held at each institution were analysed using a staged process. This process was first used on institution N and after some reflection and refinement was repeated for institution R and T.

Stage 1: Interview narrative familiarisation

The audio recording of each interview was listened to twice before the transcription process. This was to gain an initial impression of the interviews as a whole and this process took place as soon after the interview as practical. From this activity some notes were made which resulted in the provisional interview data summary document (Appendix 8). This provisional document provided a broad overview across the three institutions and aimed to summarise the key points associated with each interview. The voice recording was then transcribed verbatim to produce a Word document. The initial draft of each interview transcript was then compared against the audio recording for accuracy. This involved listening to the audio recordings a further three or four times depending on the clarity of the recording. In some cases the digital recording was not clear and this is noted in the transcript with a (?) symbol. At this stage, care was taken to ensure that the interviewee remained anonymous by removing any identifying details from the transcript, such as references to institutions and named colleagues. An example of a completed transcript is provided for the pharmacy practice-based respondent N2 (Appendix 9).

Stage 2: Identification of a thematic framework

Initial ground work was carried out on the 'N' interviews by setting up an Excel spreadsheet with the six areas of interest or domains. Sections of the written transcripts were colour coded according to each of the domains:

- Individual background issues (red)
- Pharmacy as a knowledge based profession (blue)
- Integration of the curriculum (green)

- Scientific identity of the pharmacist (brown)
- Increasing the practice component of the curriculum (purple)
- How is a pharmacist viewed? (grey)

The Excel spreadsheet was set up to have a different worksheet for each of these domains. The relevant text relating to each domain was pasted into a standardised format. At this stage I made a comment to summarise the area covered by interviewee and where appropriate a memo was written as a prompt to follow up the line of discussion in the ongoing analysis of the transcripts. Appropriate identifying information was added so that the comment could be compared across the types of respondent and institution. The column for assigning a code was left blank at this stage. An example of an extract from this process is shown in Table 4.2.

Once all of the ‘N’ interviews had been recorded in this way the entire spreadsheet was printed off and provisional codes were assigned that appeared to fit with the domain and initial comments. Care was taken to try and avoid forcing transcript areas into existing codes. This resulted in a large number of codes with substantial overlap of areas.

Table 4.2: Example extract of Excel sheet for analysis of interview N2

Comment	Code	ID	Gender	Sci/Pharm	Transcript	Memo
Not about knowing everything and the more you know the more you uncover!		N2	F	P	It's unrecognisable as a career this isn't it. And that is what the young people find so difficult to understand, in my opinion. You can never know everything and we always say to them the more you learn the more it uncovers what you don't know, and, you know, you get to the fourth year here and you have got this perception that you have been educated and you know everything you are ever going to need. But we know don't we that that's not the case, so it is a very muddy area isn't it.	Knowledge as a means of uncovering further knowledge - explore this line of discussion

The next stage was a rationalisation of the domains into four key areas: personal, knowledge, curriculum and pharmacy culture. After some adjustment of codes it was decided that the 'personal' domain did not need a separate category as the issues in this area tended to overlap into all of the other domains. The domains were therefore reduced further to three key areas:

- Knowledge (K)
- Curriculum (C)
- Pharmacy culture (P)

These three domains emerged as a useful approach to try and encapsulate the aim of the research which is to explore the link between pharmacy knowledge and professional practice (culture). Discussion of the MPharm curriculum acted as an important central vehicle to drive this discussion. Using the printed Excel sheets and the provisional codes a recoding process took place using the three domains as a guide. After a number of attempts at this process the following themes were established into the workable codes listed in Table 4.3. The provisional codes were deleted and the new codes were then assigned to the Excel spreadsheet. The entire document was pasted into a single worksheet so that the data from all of the 'N' interviews could be sorted and viewed. Using the sort function of Excel the data could then be studied in different formats. For example each of the codes (with associated identifiers), transcript extract, comments and memos could be viewed in any required order. The use of Excel in this way also supported the thematic multivariate analysis of the material as the columns that relate to subject type, gender or institution can be sorted and the data structured according to the area being investigated.

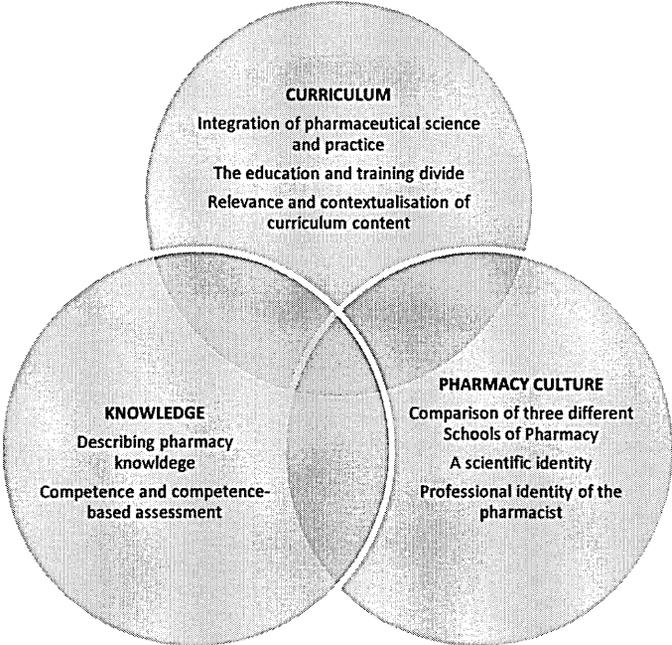
Stage 3: Confirmation of themes for discussion

This stage involved a consideration of all of the three Excel spreadsheets generated from the three types of SOP and the generation of a number of key themes that are later expanded and discussed in Chapter 6. This process involved listening again to original transcript extracts to gain further insight into the meaning behind the transcript of each respondent. The final overall themes used for further discussion are outlined in Figure 4.1 which depicts the relationship between the curriculum, knowledge and pharmacy culture domains.

Table 4.3: List of codes developed to support interview analysis of institution N

Code	Description	Domain	
CC	Curriculum contextualisation of content	Curriculum All areas that relate to the MPharm curriculum both in content and approach.	
CD	Curriculum design		
CET	Curriculum for education and training		
CF	Curriculum fit for the future		
CI	Curriculum integration		
CN	Curriculum and numeracy		
CP	Curriculum practice content		
CR	Curriculum reflection		
CS	Curriculum subject		
CSC	Curriculum and science		
CSM	Curriculum skill mix		
KA	Knowledge and application		Knowledge All areas that relate to perception of the respondent about 'knowledge' within a pharmacy context.
KC	Knowledge and competence		
KD	Knowledge decay		
KDY	Knowledge discovery		
KE	Knowledge – expert on medicines definition		
KF	Knowledge foundation important		
KL	Knowledge links		
KS	Knowledge and science		
KSA	Knowledge and science application		
KSU	Knowledge – science unique		
KT	Knowledge training		
PC	Pharmacy culture conflict	Pharmacy culture All areas that relate to the perception of the respondent about the pharmacist and their world.	
PCOMP	Pharmacy culture - Comparison with other SOPs		
PE	Pharmacy culture economic issues		
PF	Pharmacy culture – need to look to future		
PFTP	Pharmacy culture – Fitness to Practise (FTP) issues		
PI	Pharmacy culture - integrity		
PM	Pharmacy culture – pharmacist role misunderstood		
PMC	Pharmacy culture motivation clinical		
PP	Pharmacy culture – professional distinction		
PR	Pharmacy culture - responsibility		
PRT	Pharmacy culture – rational thinking		
PS	Pharmacy culture patient safety		
PSOP	Pharmacy culture within School of Pharmacy		
PT	Pharmacy culture and teaching		
PU	Pharmacy culture - undergraduates		

Figure 4.1: The integration of themes from the interviews



CHAPTER 5: QUESTIONNAIRE RESULTS AND DISCUSSION

The five stages of questionnaire analysis outlined in Chapter 4 were followed by the construction of a diagrammatic summary of the questionnaire findings (Figure 5.1) and a personal reflexive summary.

Stage 1: General questionnaire data

A total of 491 questionnaires were sent out and 197 were returned (40.1% response rate).

Table 5.1: Types of School of Pharmacy (SOP) in sample group

SOP code	Number sent out	Number returned	Type of SOP (code)
1	47	37	Post-92 (teaching) T
2	29	11	
3	27	4	
4	44	15	
<i>Total</i>	<i>147</i>	<i>67 (45.6%)</i>	
5	26	14	Post-92 New SOP N
6	39	22	
7	33	12	
8	37	12	
<i>Total</i>	<i>135</i>	<i>60 (44.4%)</i>	
9	51	16	Established universities (research) R
10	55	16	
11	55	17	
12	48	21	
<i>Total</i>	<i>209</i>	<i>70 (33.5%)</i>	
Total overall	491	197 (40.1%)	

The sample group is broadly representative of pharmacy academics in England as the questionnaire was sent to three different types of SOP and to all members of staff involved in the teaching of the MPharm programme within

each institution. The sample is from 12 SOP in England, over a wide geographical area, out of a possible 26 institutions in the UK that have a pharmacy programme. Tables 5.2-5.5 show the breakdown of the sample of returned questionnaires.

Tables 5.2-5.5:

Percentage of respondents with reference to: gender/age/pharmacist/non-pharmacist and subject area

Table 5.2: Gender

Male	53.8
Female	46.2
Total	100.0

Table 5.3: Age

Age range	
20-29	1.5
30-39	33.2
40-49	31.1
50-59	25.5
Over 60	8.7
Total	100.0

Table 5.4: Pharmacist/Non-Pharmacist

Registered pharmacist	55.3
Pharmacist but not registered	7.1
Non-pharmacist	37.6
Total	100.0

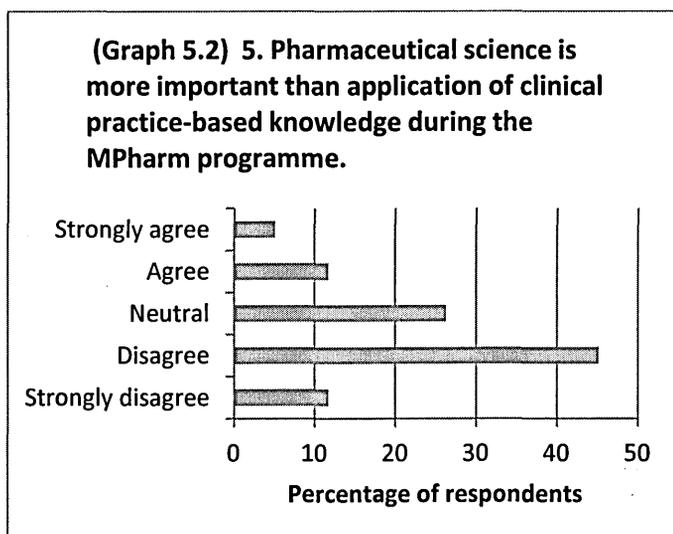
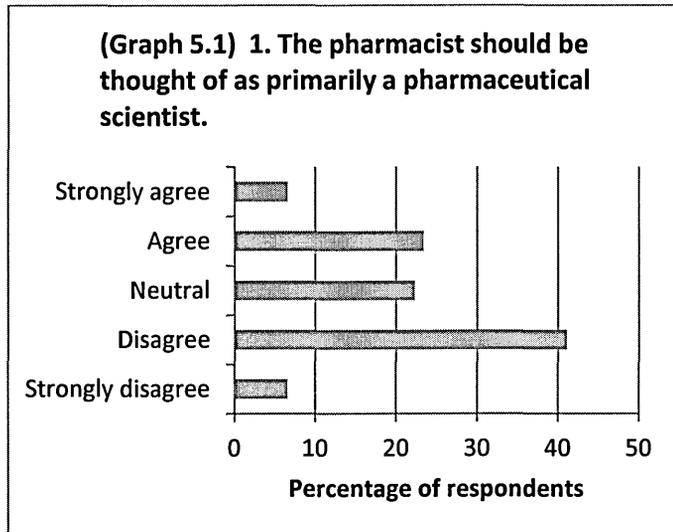
Table 5.5: Subject area

Pharmaceutical chemistry	16.8
Pharmaceutics	18.3
Pharmacology	15.2
Pharmacy Practice/Clinical Pharmacy	49.7
Total	100.0

Stage 2: Questionnaire statements

The second stage involved the examination of the overall response to each of the questionnaire statements. To support the interpretation of these responses the statements were grouped into themes.

Theme 1: Scientific identity (Statements 1 and 5)

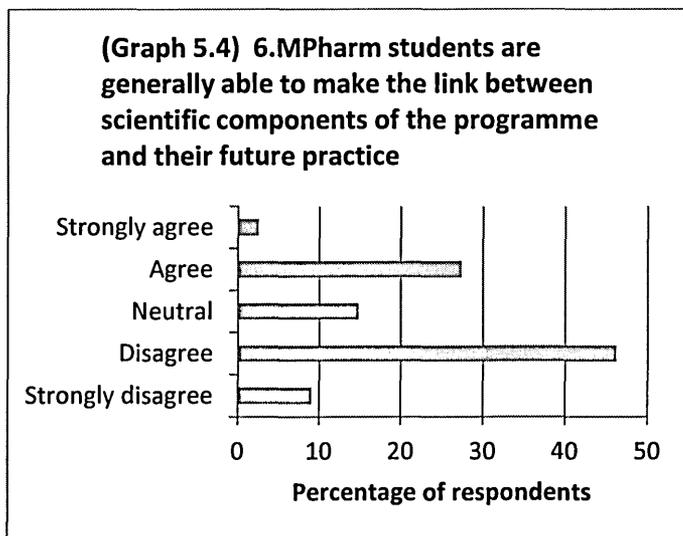
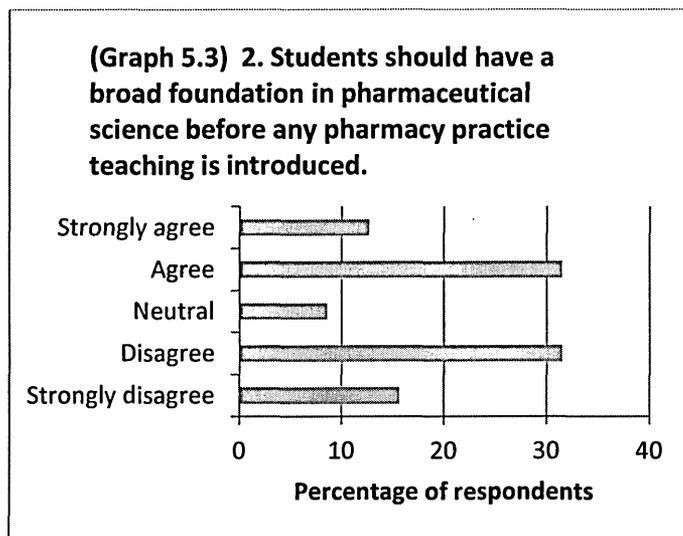


Statements 1 and 5 aimed to gauge whether pharmacy academics in the broadest sense are sympathetic towards pharmacy being identified as primarily scientific with an overall scientific identity. There is more disagreement with these statements suggesting that there is a question mark over the scientific

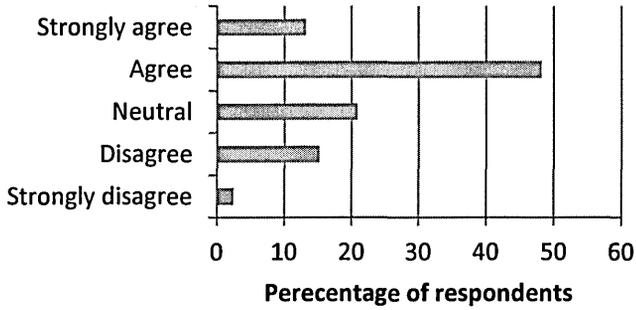
tradition. Over half of the respondents are pharmacists and approximately half of respondents teach pharmacy practice and this was taken into consideration in the next stage of the questionnaire analysis. Approximately a quarter of respondents are unsure and this may link to the view that science and application through clinical practice should not be thought of as separate and distinct.

Theme 2: Integration of science and practice (Statements 2*,6,7,8 and 14)

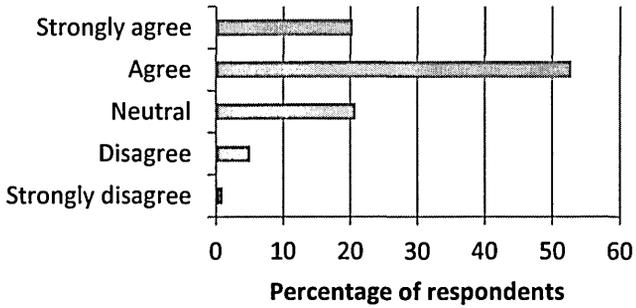
(*Statement is written in the opposite way so that a negative response indicates support for the issue being investigated. For example disagreement with statement 2 would suggest a greater tendency towards an integrated approach.)



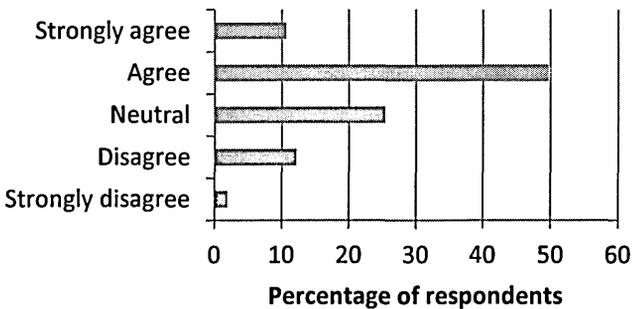
(Graph 5.5) 7. Pharmaceutical scientists and pharmacy practitioners work together to contextualise the pharmaceutical science content of the MPharm curriculum.



(Graph 5.6) 8. A lot of effort is made in the delivery of the MPharm programme to link pharmacology to a pharmacy practice context.



(Graph 5.7) 14. A lot of effort is made in the MPharm programme to link pharmaceutical chemistry/pharmaceutics to a pharmacy practice context



Statement 2 aimed to capture attitudes towards splitting the MPharm into a two plus two model where scientific studies are mainly concentrated into the first

two years and practical application into the final two years. This is a traditional MPharm curriculum and is diametrically opposed to the principle of integration as seen in the current development of MPharm degree courses. There are approximately equal numbers of respondents on either side of neutral so opinion on this issue is clearly divided. Slightly more respondents strongly disagreed with the statement and this mixed attitude towards integration was followed up in the interview study.

Statement 6 centres on an interpretation of how academic members of staff view the question: Do students see science and practice as separate? This question is not addressed to undergraduates but is the perception of pharmacy educators in contact with undergraduates. There is considerable disagreement with this statement as over half of the respondents indicate that students do not necessarily make the link between science and practice. This issue was followed up by the interview study to explore if this a curriculum management issue or more of a cultural issue within pharmacy education.

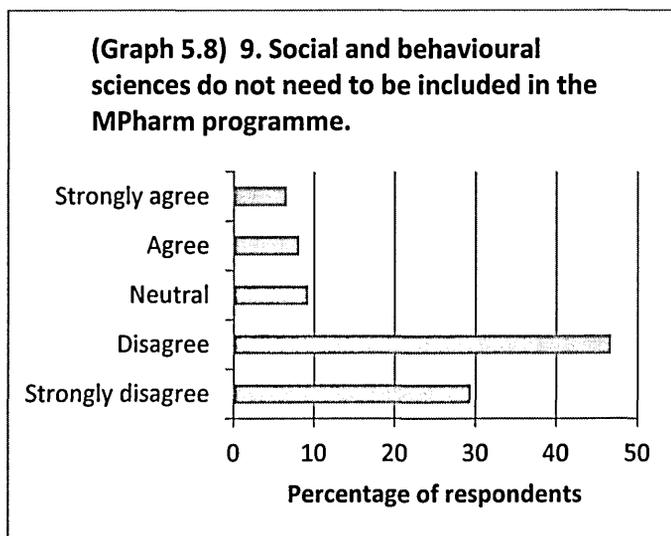
Statement 7 aims to gain some insight into the contextualisation of knowledge within the MPharm curriculum. For example work on functional groups in chemistry could be related to antibiotic action and resistance and this requires an integration of subjects, signposting to the relevance of the physical sciences and an explicit attempt to put the science within a practice context. There is a high level of agreement that educators work together to contextualise material in this way.

Statement 8 specifically examines the integration of biological sciences with practice. Over 70% of respondents agree that a lot of effort is made to integrate biological sciences and practice. It would be expected to see this type of clear link as there are logical connections between pharmacology and therapeutics. Respondents who are uncertain may simply not know as this is not their subject area and do not wish to comment. There are very few respondents (6%) who disagree that effort is made in this area of integration.

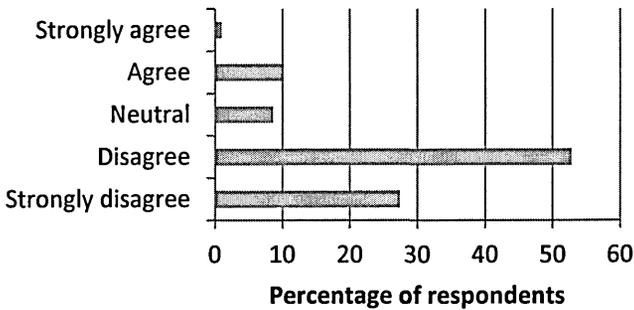
Statement 14 draws substantial (60%) agreement from respondents that an effort is made to link physical sciences to pharmacy practice context but approximately 25% are uncertain about this. Pharmaceutical chemistry and pharmaceutics are areas of the curriculum that have been eroded in recent years to make space for more practice-based areas. There is not as much agreement about integration of the physical sciences as is seen for biological sciences in statement 8. This was discussed further in the interview study.

Theme 3: Practice-based curriculum (Statements 9*,10,13)

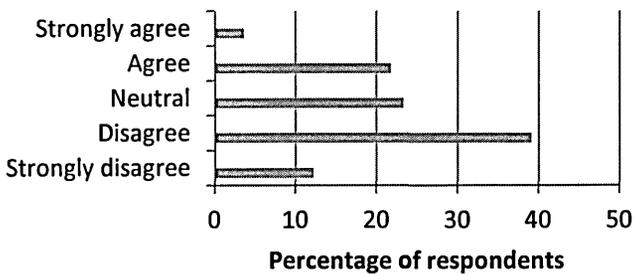
(*Statement is written in the opposite way so that a negative response indicates support for the issue being investigated. For example disagreement with statement 9 would suggest a greater tendency towards a practice-based curriculum.)



(Graph 5.9) 10. The MPharm curriculum should only include areas that are directly relevant to community, hospital and industrial practice



(Graph 5.10) 13. The MPharm programme should focus more on competence-based outputs that are linked to professional practice rather than pharmaceutical science.

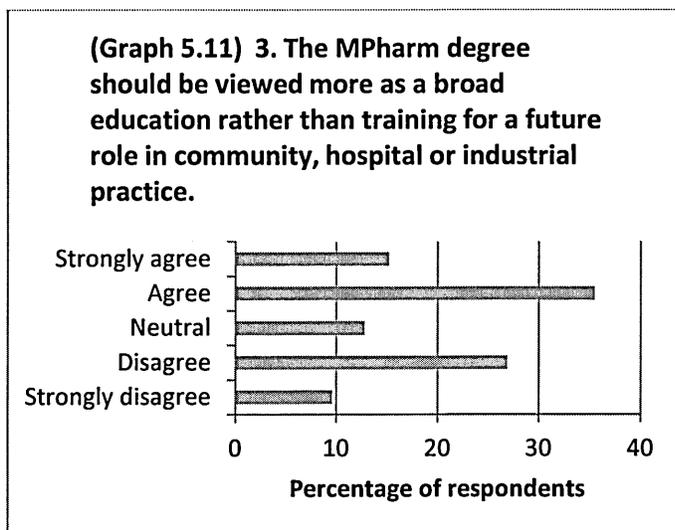


Statement 9 aims to determine views on the place of social and behavioural sciences (SBS) within the MPharm curriculum. There is clear disagreement with the statement that SBS should not be included indicating a strong level of support for this part of the programme. The extent of this view and how respondents interpret the inclusion of SBS was explored in more detail in the interviews as there is some confusion shown in the literature over how social pharmacy is defined and delivered (Harding and Taylor, 2006).

Statement 10 focuses on the issue of relevance of content in relation to practice content in the curriculum. Anecdotally certain parts of the MPharm curriculum are seen as irrelevant to the needs of the practising pharmacist. For example certain aspects of the physical sciences are viewed by some as too abstract and are the result of the time when the pharmacist would be more involved in compounding. A large proportion of respondents (80%) disagree that the curriculum should only contain areas that are relevant to practice. This infers that a certain amount of material in the curriculum is important in its own right and relevance to practice is not the main issue. This area was explored further in the interviews and linked to the idea of the MPharm being a wider educational process rather than a vocational training programme.

Statement 13 examines how the respondents view the move towards a more competence-based approach. This issue is contrasted with pharmaceutical science where the emphasis is more on subject content than competence-based outputs. The reaction to this statement (25% agreement) is contrary to the current climate within pharmacy education where there is a drive for more competence-based outputs. Over 50% disagree with this direction of travel. A further 23% are unsure which suggests there is a certain amount of hesitation about this trend within pharmacy education. In stage 3 of the questionnaire analysis I examined the issue of a more practice-based curriculum in further depth by identifying the type of respondent holding particular viewpoints.

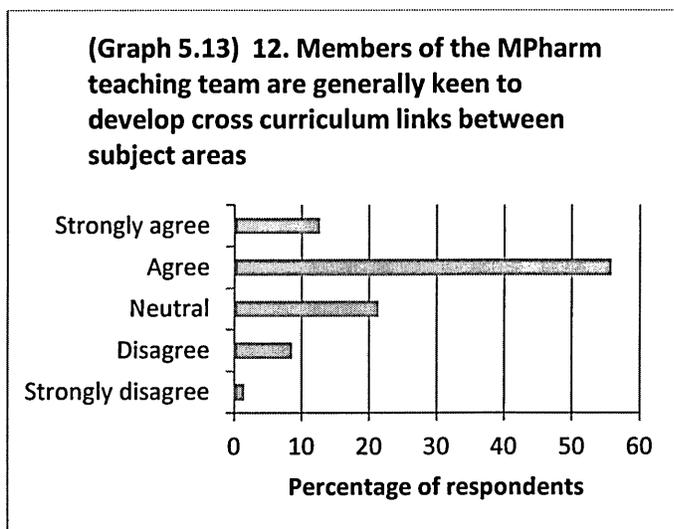
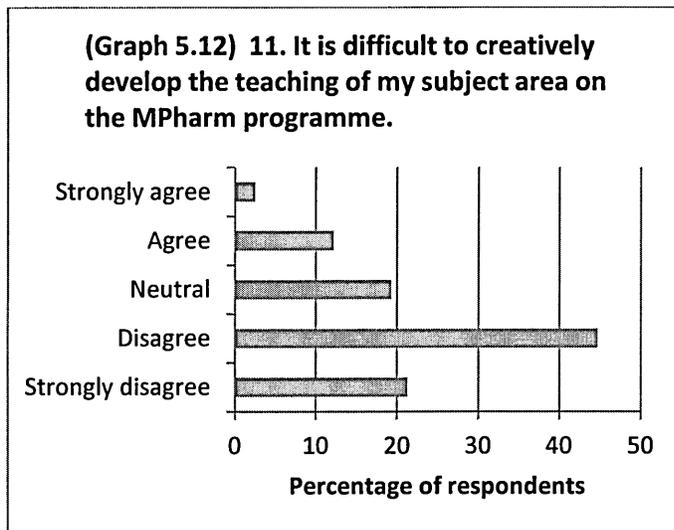
Theme 4: MPharm as wider education (Statement 3)



Statement 3 examines the attitude of respondents towards the MPharm being viewed as a wider educational process rather than a vocational training programme. Approximately 50% of respondents agreed that the MPharm degree should be viewed more as broad education. There is more agreement than disagreement with the MPharm as an educational process, which is in contrast to the increasing emphasis on a vocational approach to pharmacy education such as placement-based learning and specific reference to performance standards. In stage 3 of the questionnaire analysis I examined a more detailed breakdown of which type of respondent views the MPharm as educational rather than vocational and this dichotomy was explored further during the interviews.

Theme 5: Ease of MPharm development (Statements 11* and 12)

(*Statement is written in the opposite way so that a negative response indicates support for the issue being investigated. For example disagreement with statement 11 would suggest a greater tendency towards MPharm development.)

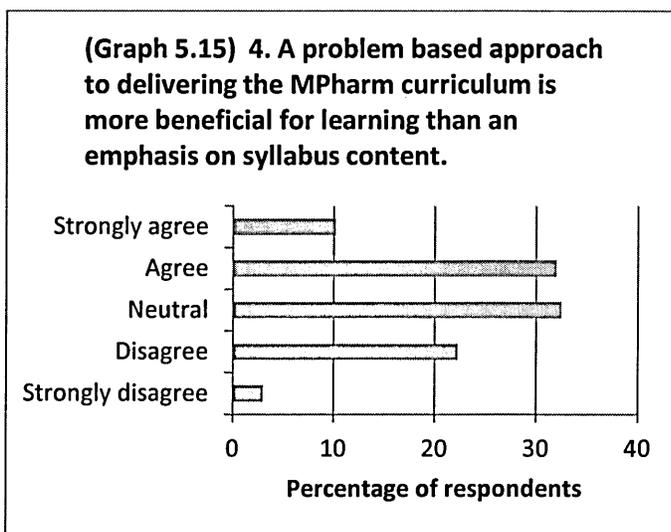
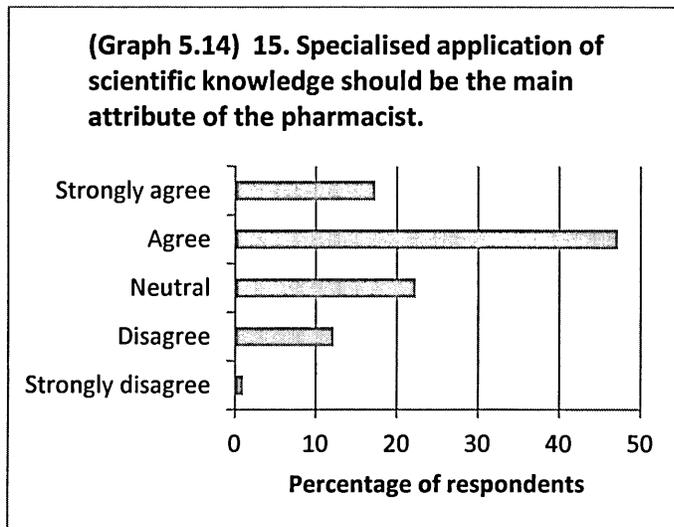


Statement 11 aimed to determine the ease with which pharmacy educators feel they can develop their subject area within the curriculum. From the sample, 65% disagree with this statement that it is difficult to develop their subject area and this supports a positive tendency to work towards integration and MPharm

development. The opposite view expressed by 14% of the sample needs further analysis and this was undertaken in stage 3 of the questionnaire analysis.

Statement 12 also focused on subject development but looked more specifically at the perception of the quality of relationships between disciplines. There was a positive response to the issue of pharmaceutical scientists and pharmacy practitioners working across the curriculum and this was explored further in the interviews.

Theme 6: Knowledge application (Statements 15 and 4)



Statement 15 relates to the professional identity of the pharmacist as a scientist who can apply specialised knowledge. The view on this area was important to uncover as this impacts on how pharmacists are prepared for their role. In this sample 64% of respondents agree with this view of the pharmacist and there was a high level of strong agreement (17%). If the overriding view is that the profession is about application of scientific knowledge, this presents the challenge of how this can be supported within pharmacy education.

Statement 4 was intended to look at attitudes towards a more holistic approach to the MPharm curriculum where science and practice are linked to real cases. Some respondents may have interpreted this in a more narrow sense as agreement with problem-based learning (PBL) classroom sessions as useful for learning as opposed to more traditional ways of teaching. This may have caused the more polarised view either side of neutral for this statement. Approximately one third of respondents were unsure and there were some comments about the clarity of this statement.

Stage 3: Analysis of the themes across a range of variables within the sample.

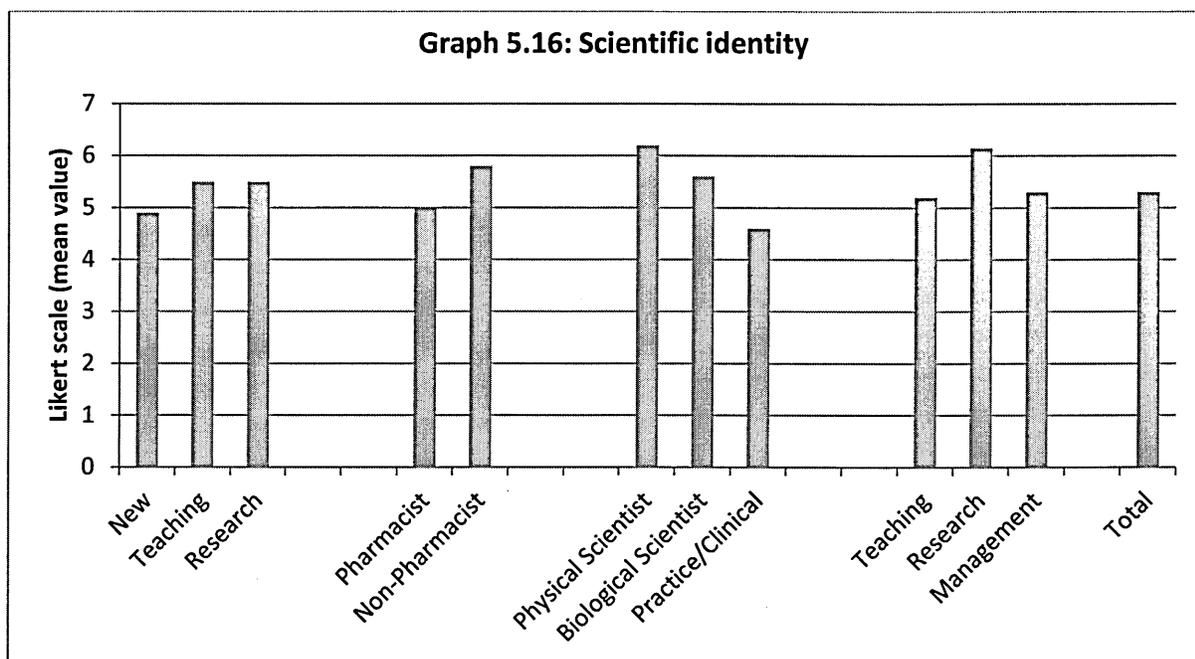
A set of mean Likert values were calculated for each theme using the combination of statement responses for each theme and the calculation process outlined in Chapter 4. The purpose of this stage was to look more closely at a number of specific variables in relation to the mean response for each theme. The absolute values are not seen to describe an objective reality but to illustrate potential issues that are developed further in the qualitative work. For each themed graph the following variables were investigated using SPSS software to isolate respondents by type:

- Type of School of Pharmacy (SOP): New/Teaching/Research
- Pharmacist or Non-Pharmacist
- Subject area: Physical Scientist, Biological Scientist, Practice/Clinical
- Main role profile: Teaching/Research/Management

Table 5.6: Summary matrix of analysis of questionnaire by theme

Graph	Theme	Statements from the questionnaire	Calculation for y axis (Likert scale mean value)
5.16	SCIENTIFIC IDENTITY	1 5	For (highest value) = 10 Neutral = 6 Against (lowest value) =2
5.17	INTEGRATION OF SCIENCE/PRACTICE	2 reverse values 6 7 8 14	For (highest value) = 25 Neutral = 15 Against (lowest value) =5
5.18	PRACTICE BASED CURRICULUM	9 reverse values 10 13	For (highest value) = 15 Neutral = 9 Against (lowest value) =3
5.19	MPharm AS WIDER EDUCATION	3	For (highest value) = 5 Neutral = 3 Against (lowest value) =1
5.20	EASE OF MPharm DEVELOPMENT	11 reverse values 12	For (highest value) = 10 Neutral = 6 Against (lowest value) =2
5.21	KNOWLEDGE APPLICATION	15 4	For (highest value) = 10 Neutral = 6 Against (lowest value) =2

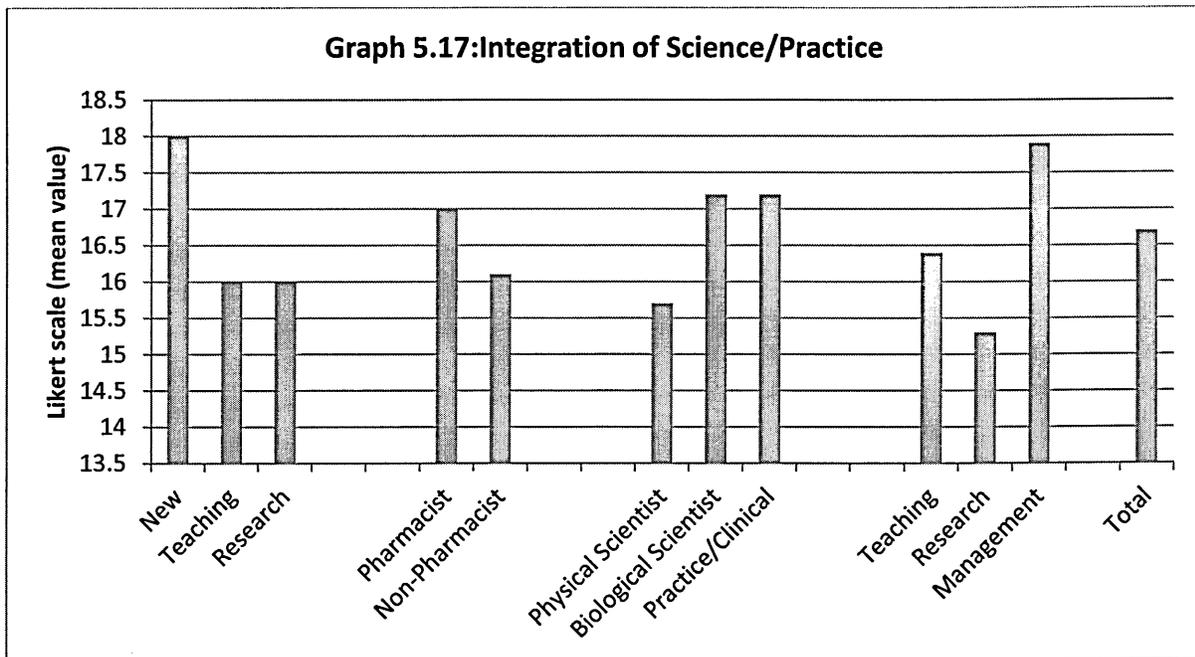
Theme: Scientific identity



Likert scale mean value (Graph 5.16)	
For (highest value)	10
Neutral	6
Against (lowest value)	2

The overall response for this theme (mean score for all respondents, as indicated by the total column) is below the neutral point. All types of SOP are below a neutral mean value and suggest that a pharmacist is not viewed mainly as a pharmaceutical scientist. This is more evident in newer SOP. Non-pharmacists are more positive about a scientific identity than pharmacists. However, both non-pharmacists and pharmacists are below the midpoint on the scale, so scientific identity is not seen as the main attribute by either of these groups. There is a difference between pharmacy practice respondents and physical and biological scientists. Overall scores are low on the scale of the pharmacist having a scientific identity, with only the physical scientists just above the midpoint. It is only the research-based respondents and physical scientists that show a slight tendency towards the pharmacist having a scientific identity.

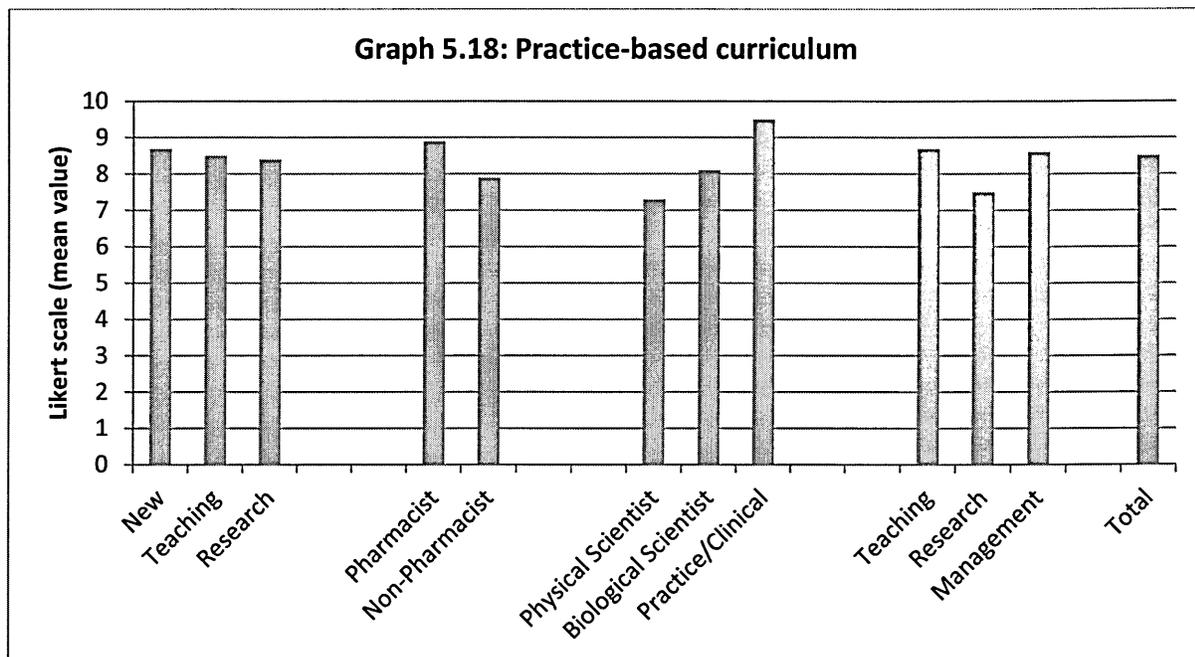
Theme: Integration of Science and Practice



Likert scale mean value (Graph 5.17)	
For (highest value)	25
Neutral	15
Against (lowest value)	5

The overall response for this theme (total column) is above the neutral point. All of the sub-groups are above the neutral point, indicating that integration of science and practice is viewed as important. Teaching and research-based SOP demonstrate a similar response but the newer SOP are more pro integration and demonstrate the highest level of agreement with this theme. Pharmacists are more positive than non-pharmacists about curriculum integration. Similar results are shown for both biological scientists and the pharmacy practice group. Physical scientists are less positive about curriculum integration. Respondents with a mainly management role demonstrate high levels of agreement with integration compared to respondents with a research role. Respondents with a mainly teaching role have similar levels of agreement to the sample as a whole.

Theme: Practice-based curriculum



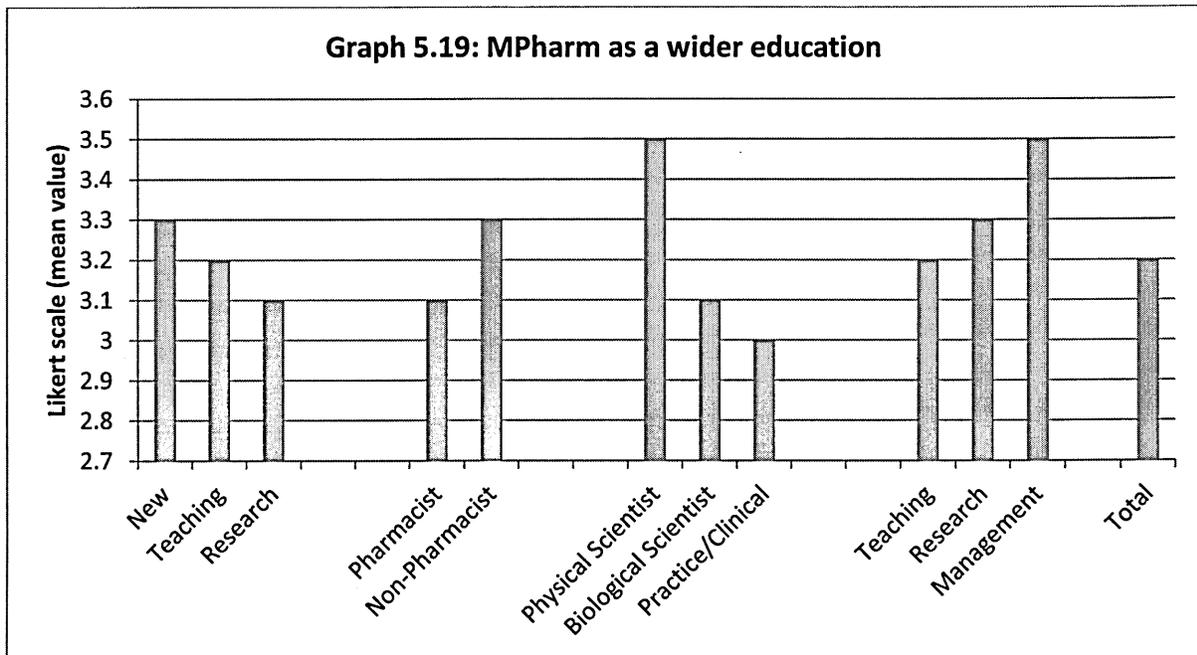
Likert scale mean value (Graph 5.18)	
For (highest value)	15
Neutral	9
Against (lowest value)	3

The overall response for this theme (total column) is slightly below the neutral point. All sub-groups are also below the neutral point with the exception of practice/clinical-based respondents who slightly favour a more practice-based curriculum.

The different types of SOP have similar levels of agreement with questionnaire statements that suggest a more practice-based focus, with a marginally more positive response from newer SOP. There is a minimal difference between pharmacists and non-pharmacists, with pharmacists being more positive towards a practice-based curriculum but overall both groups are hesitant about this curriculum trend. It is notable that the pharmacist sub-group do not exceed the neutral point whereas respondents teaching mainly pharmacy practice are the only group to show some agreement with positive practice-based

questionnaire statements. There is considerable cross-over between pharmacists and the pharmacy practice teaching group. On checking the data input into SPSS it is clear that some respondents who are pharmacists are involved in the teaching of science rather than pharmacy practice and this would impact on their viewpoint.

Theme: MPharm as a wider education

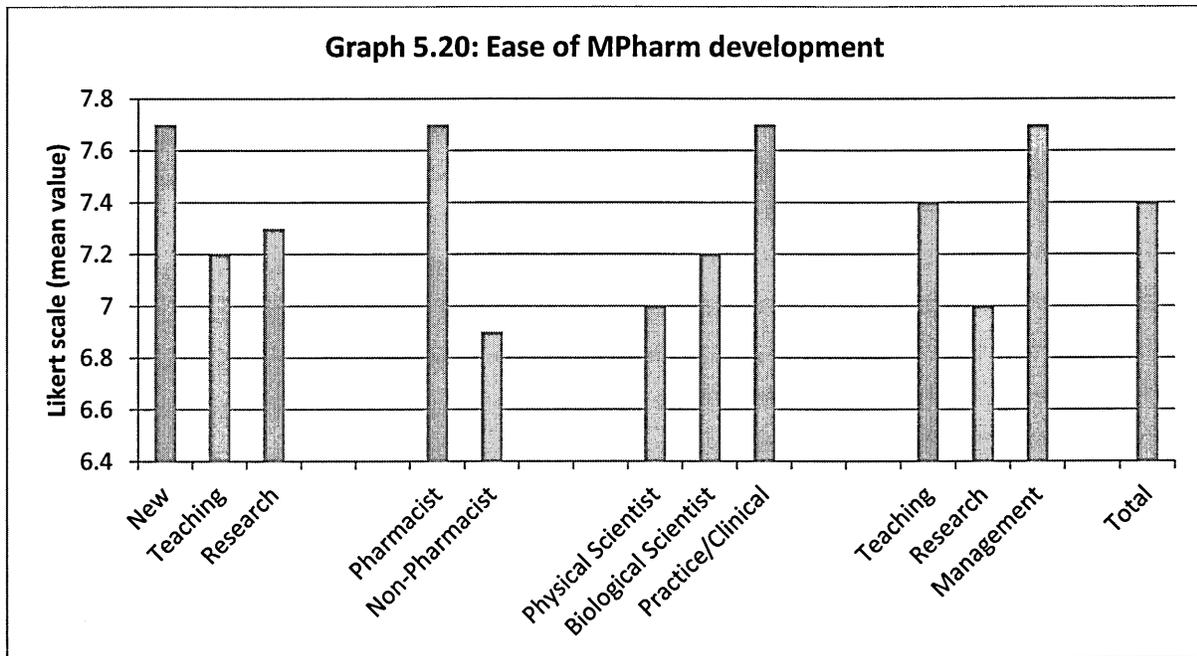


Likert scale mean value (Graph 5.19)	
For (highest value)	5
Neutral	3
Against (lowest value)	1

This theme is based on a single statement and the overall response for this theme (total column) is slightly above the neutral point, suggesting there is slight tendency for respondents to view the MPharm as a wider education rather than a training process. All subgroups are also above the neutral point with the exception of practice/clinical-based respondents who are neutral about this statement. Newer Schools of Pharmacy are slightly more positive about this statement compared to teaching and research-based institutions respectively.

Physical scientists and respondents who have a mainly management role are the most positive about this statement.

Theme: Ease of MPharm development



Likert scale mean value (graph 5.20)	
For (highest value)	10
Neutral	6
Against (lowest value)	2

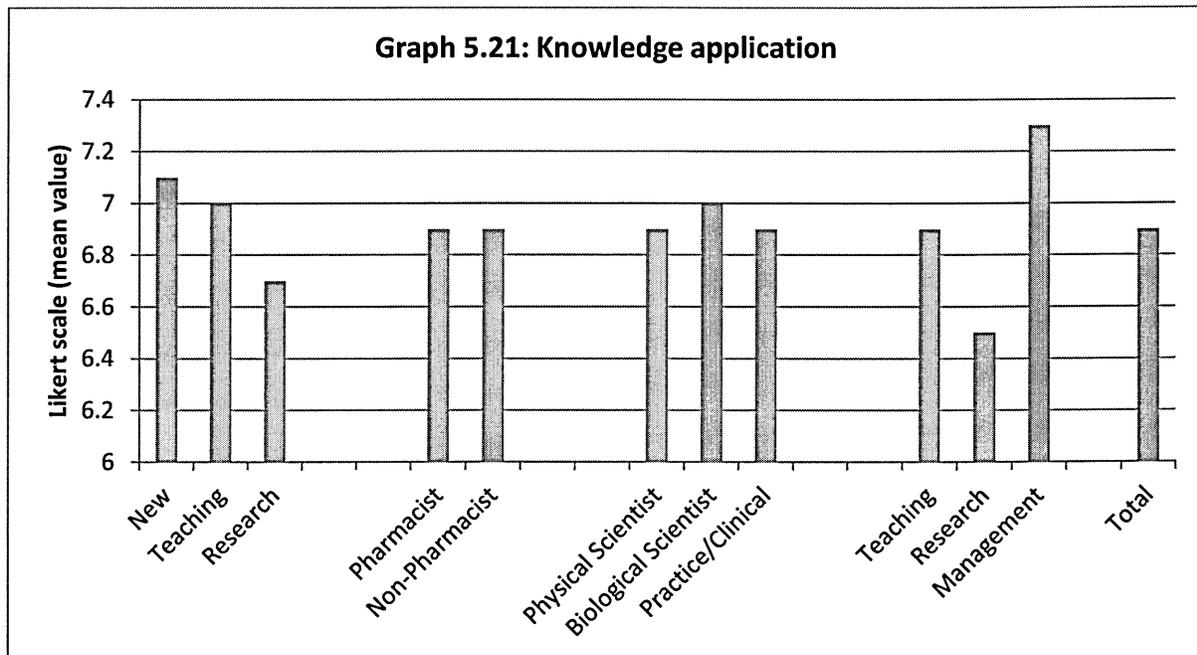
The overall response for this theme (total column) is above the neutral point.

The newer Schools of Pharmacy are more positive about the potential to develop the MPharm programme, compared to the other two types of institution.

The highest levels of agreement are seen by pharmacists compared to non-pharmacists. There was a similar contrast between the practice/clinical-based respondents compared to pharmaceutical scientists. This large similarity would be expected due to the cross-over between pharmacists and respondents teaching pharmacy practice. However, not all of the pharmaceutical scientists would be non-pharmacists. Respondents with a management role also demonstrate higher levels of agreement compared to colleagues who are

mainly involved with teaching or research. This may be due to the wider view necessary for their management role. Other explanations are that managers follow an 'official' line or the logic of their practice fits this viewpoint.

Theme: Knowledge application



Likert scale mean value (Graph 5.21)	
For (highest value)	10
Neutral	6
Against (lowest value)	2

The overall response for this theme (total column) is above the neutral point. All sub-groups are above the midpoint. There is agreement across all three types of SOP that application of pharmaceutical knowledge is important. There is slightly higher level of agreement from newer SOP followed by teaching based SOP and research based SOP respectively. Both pharmacists and non-pharmacists indicate a similar level of agreement and this is also shown across the different subject disciplines. Managers demonstrate the most positive agreement with this theme compared to teaching and research-based colleagues.

Stage 4: Initial summary of the questionnaire data and investigation of further variables

In the next stage of analysis I checked whether any differences highlighted in the previous stage are influenced by other variables. The two questions examined were:

1. Are there gender differences for the following findings that have been outlined in the data so far?
 - The newer SOP are more in favour of integration of science and practice than teaching and research SOP
 - Non-pharmacists view pharmacists as having a greater scientific identity than pharmacists
 - Non-pharmacists are less inclined towards curriculum development
 - Pharmacy practice respondents are more in favour of increased practice-based teaching than science-based colleagues

2. The newer SOP are more pro integration than teaching and research SOP. Is this the same for pharmacists/non-pharmacists?

Gender differences

Using SPSS a series of cross tabulations and graphs were processed to determine if there was any difference in gender viewpoint across the different types of SOP. This involved producing the same graphs for male and female respondents across the findings outlined under question one above. It was seen

that there were similar graphs for male and female respondents looking at the differences in the data so there is no evidence of a gender difference for these issues. Table 5.2 shows approximately equal total numbers of male and female respondents. However, there is an imbalance for gender in the cross tabulation between pharmacists and non-pharmacists shown in Table 5.7.

Table 5.7: Cross tabulation data for pharmacist/non-pharmacist/gender

	Male	Female	Total
Pharmacist	53	70	123
Non-Pharmacist	53	21	74
Total	106	91	197

There is a bias in the non-pharmacist group towards male as there are 53 male compared to 21 female respondents. Conversely in the pharmacist group there is a more female bias with 70 female respondents compared to 53 male respondents. According to the available data from the *Pharmacy workforce census* 2.8% of pharmacists work in academia and of these 51.2% are male and 48.8% are female (Seston and Hassell, 2009). This suggests that the high proportion of female pharmacist respondents in this study is not representative of the approximately equal gender balance within pharmacy academia.

Pharmacist/Non-Pharmacist

The cross tabulation for pharmacist/non-pharmacist by type of SOP demonstrated a bias towards pharmacists (rather than non-pharmacists) in newer SOPs compared to research-based and teaching-based SOP. In summary, it is the pharmacist/non-pharmacist variable that is influencing attitude rather than the gender of the respondent.

Stage 5: Analysis of questionnaire written comments

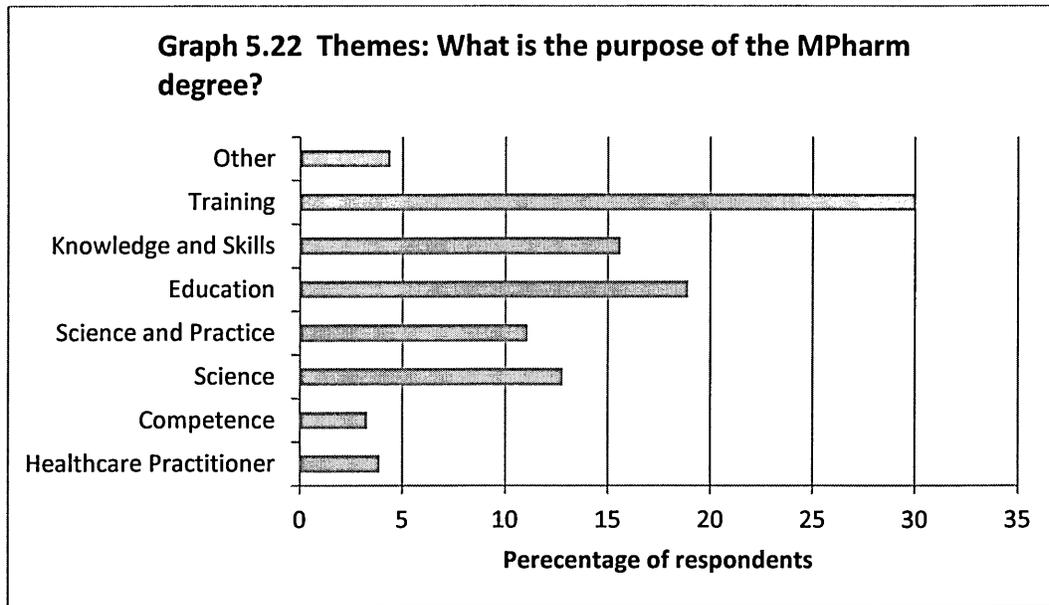
The questionnaire requested answers to three questions (Tables: 5.8, 5.9, 5.10)

All of the responses were collated and read several times before assigning one main theme code to the statement of each respondent. Where the response raised a number of issues, the first or main issue mentioned was assigned a code.

Table 5.8: What in your view is the MPharm degree for?

Main theme	Example comment within this theme	Code	Number of respondents	Percentage of respondents
Healthcare practitioner Preparation of healthcare practitioners for practice	<i>To prepare healthcare practitioners with a focus on hospital and community.</i>	HCP	7	3.9
Competence Development of competence in practice	<i>To be equally competent in clinical practice and pharmacology/pharmaceutical science.</i>	COMP	6	3.3
Science An emphasis on underlying pharmaceutical sciences	<i>To give students a firm foundation in science, that is relevant to the practice of pharmacy.</i>	SCI	23	12.8
Science and Practice The equal importance and link between pharmaceutical sciences and professional practice	<i>To produce pharmacists with more than sufficient scientific knowledge and practice skills in order that the individual is equipped to start a career in any sector of pharmacy.</i>	SCI/PRAC	20	11.1
Education An emphasis on education rather than training for a specific role	<i>To provide a broad education in the underlying pharmaceutical sciences.</i>	EDUC	34	18.9
Knowledge and Skills The link between knowledge and skills that can be applied to the workplace setting	<i>To provide a wide knowledge base and the opportunity to apply that knowledge in a safe environment.</i>	K&S	28	15.6
Training Pragmatic issues associated with training of the future pharmacist.	<i>To provide training for future pharmacists.</i>	TRAIN	54	30.0
Other Comment does not fit into any of the above themes	<i>A range of comments such as: Improving quality of pharmaceutical advice. Very broad and much that is irrelevant</i>	OTHER	8	4.4
		Total	180	100

Graph 5.22: Descriptions of the purpose of the MPharm degree by percentage of respondents who mention a specific theme using data from Table 5.8.

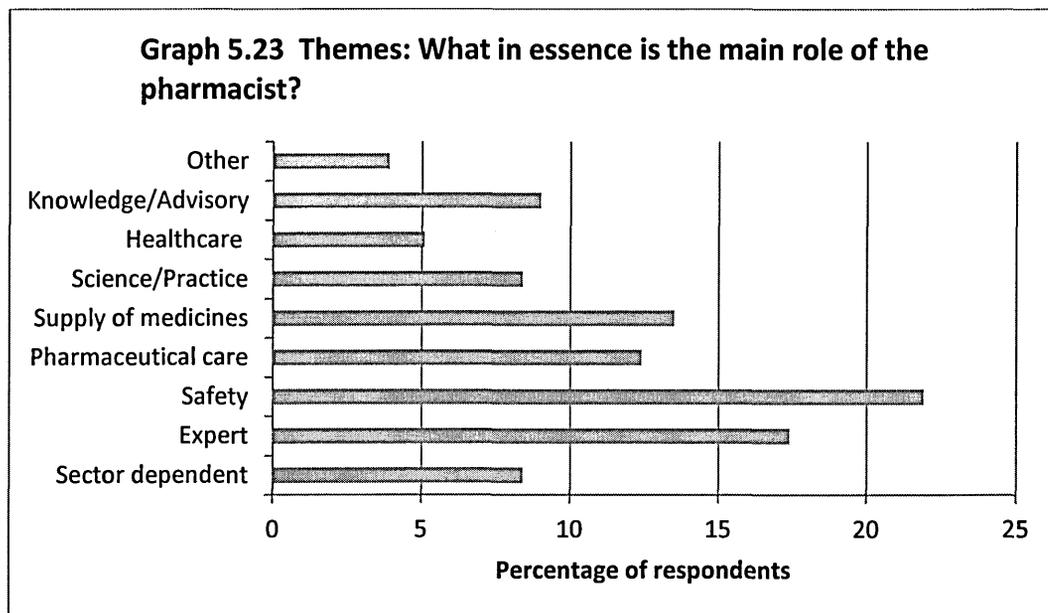


Almost a third of respondents described the purpose of the MPharm degree as a training programme. The themes of education, science alone and science and practice linked are also seen as important themes. The issue of competence is mentioned by the smallest number of respondents.

Table 5.9: What in essence is the main role of the pharmacist?

Main theme	Example comment within this theme	Code	Number of respondents	Percentage of respondents
Sector The answer to this question depends on the sector of practice.	<i>Depends on where they work.</i>	SECTOR	15	8.4
Expert Pharmacist is the medicines expert	<i>A resource and expert in drugs, medicines and their use.</i>	EXPERT	31	17.4
Safety The pharmacist is mainly concerned with medicines and patient safety.	<i>Patient safety</i> <i>Ensure the safe choice and supply of medicines.</i>	SAFETY	39	21.9
Pharmaceutical care The main role is to offer pharmaceutical care.	<i>Pharmaceutical care of patients</i>	CARE	22	12.4
Supply Supply function i.e. mainly dispensing.	<i>Dispense appropriate pharmaceutical medicine.</i>	SUPPLY	24	13.5
Science/Practice Mainly concerned with the interface between pharmaceutical science and pharmacy practice.	<i>A pharmacist is a pharmaceutical scientist working at the interface between prescriber and patient.</i>	SCI/PRAC	15	8.4
Healthcare professional Works as a healthcare professional and communicates with other healthcare professionals	<i>Adopt key roles in healthcare where specialism is in all aspects of medicine.</i>	HCP	9	5.1
Knowledge/Advisory Using knowledge to provide patient care.	<i>Medicines knowledge to advise the multi-professional healthcare team.</i>	KNOW	16	9.0
Other Comment does not fit into any of the above themes	<i>A range of comments such as:</i> <i>Very little use of specialist knowledge is made in most pharmacy jobs.</i> <i>Engaging with current evidence based practice.</i>	OTHER	7	3.9
		Total	178	100.0

Graph 5.23: Descriptions of the main role of the pharmacist by percentage of respondents who mention a specific theme using data from Table 5.9.

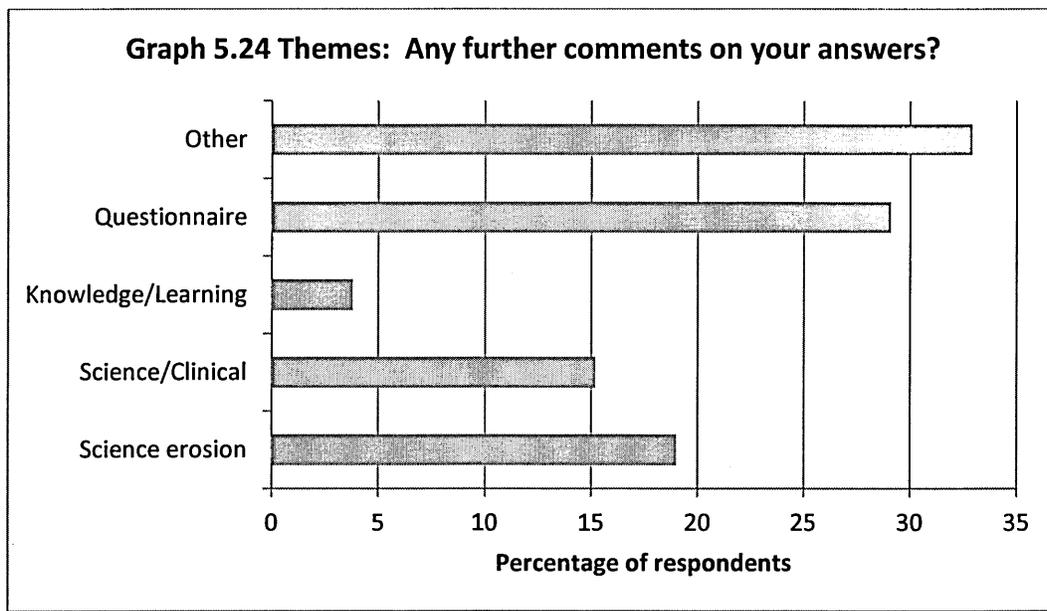


Approximately a fifth of respondents described the main role of the pharmacist as concerned with patient safety. Other important themes are 'medicines expert', supplying medicine and pharmaceutical care. Themes such as the interface between science and practice and the role of the pharmacist as a healthcare practitioner are not described as frequently.

Table 5.10: Any further comments on your answers? Please feel free to expand or qualify any of your responses in the above section.

Main theme	Example comment within this theme	Code	Number of respondents	Percentage of respondents
Science The erosion of pharmaceutical science from the curriculum.	<i>Science is being sidelined too much in the MPharm. It is seen as second rate and irrelevant and this is often reinforced by the ignorance and narrow-minded approach of the practice staff.</i>	SCIENCE	15	19.0
Science/Clinical The importance of integration and contextualisation of science and practice	<i>The MPharm should have a strong scientific content but in an applied context.</i>	SCI/CLIN	12	15.2
Knowledge/Learning The importance of pharmaceutical knowledge and ongoing learning	<i>We have a responsibility to teach not only professional aspects but a wide range of transferable skills that will be attractive to future employers, as well as education for education sake – the joy of learning.</i>	KNOW/LEARN	3	3.8
Questionnaire A comment on specific questions on the questionnaire	<i>A range of comments that could be used in the further development of the questionnaire.</i>	QUESTION	23	29.1
Other Comment does not fit into any of the above themes	<i>A range of comments</i>	OTHER	26	32.9
		Total	79	100

Graph 5.24: Descriptions of further responses and clarification by percentage of respondents who mention a specific theme using data from Table 5.10.



Approximately a third of responses defined as 'other' could not be clearly categorised. The diverse range of issues covered by these comments included:

- The struggle to identify if a more clinical curriculum is more useful for future practice
- Students having difficulty in seeing the relevance of the MPharm scientific content to their future career
- The view that students require more rigorous analytical skills

These comments could not be themed or amalgamated. Approximately a third of responses commented on specific questions on the questionnaire which would be useful if the questionnaire was being further developed. Approximately a fifth of responses were concerned about the erosion of pharmaceutical sciences from the MPharm curriculum.

Summary of questionnaire findings

A diagrammatic representation of the findings from the questionnaire study is shown in Fig 5.1.

Fig 5.1: Summary of overall trends from questionnaire study

+ /- = overall view of respondents in relation to questionnaire theme

+			<p>More obvious in:</p> <ul style="list-style-type: none"> • new Schools of Pharmacy pharmacists manager roles 	<p>More obvious in:</p> <ul style="list-style-type: none"> • pharmaceutical scientists who are non-pharmacists (especially physical scientists) 	<p>More obvious in:</p> <ul style="list-style-type: none"> • new Schools of Pharmacy pharmacists 	<p>More obvious in:</p> <ul style="list-style-type: none"> • new Schools of Pharmacy
THEME	<p>The pharmacist and profession has a SCIENTIFIC IDENTITY</p>	<p>The move within pharmacy education to include more PHARMACY PRACTICE</p>	<p>The INTEGRATION of pharmaceutical science and pharmacy practice within the curriculum</p>	<p>The view of the MPharm programme as EDUCATIONAL rather than a training programme</p>	<p>The ease of MPharm PROGRAMME DEVELOPMENT (working with colleagues across disciplines)</p>	<p>The APPLICATION OF KNOWLEDGE as a key role within both pharmacy education and the profession</p>
-	<p>More obvious in:</p> <ul style="list-style-type: none"> • new Schools of Pharmacy pharmacists 	<p>More obvious in:</p> <ul style="list-style-type: none"> • pharmaceutical scientists who are non-pharmacists 				

Overall the questionnaire results represent the MPharm curriculum as an educational rather than a training programme where there is the integration of science and practice and the opportunity to apply knowledge. There is a positive view about the development of the MPharm programme and collaboration with colleagues across science and practice subject areas. There is a negative response to the increase in pharmacy practice within the curriculum, particularly from pharmaceutical scientists. The portrayal of the pharmacy profession as having a scientific identity is also viewed negatively, particularly in new Schools of Pharmacy.

The positive view of the integration of science and practice, the ease of curriculum development and the importance of knowledge application is more pronounced in pharmacists and new Schools of Pharmacy. Pharmaceutical scientists, particularly physical scientists who are not pharmacists view the MPharm programme more as an educational rather than a training programme.

Reflexive summary

With my scientific educational background I expected that I would feel more comfortable with the questionnaire study, where responses to questions were quantified and graphs generated to display information about the sample group. However it became clear as early as the design stage where I was formulating and piloting questionnaire statements that this research instrument opens up a further set of unanswered questions, rather than providing specific definitive answers about the area of focus. I decided against the positivist generation of a range of statistics to highlight and defend my questionnaire findings summarised in Figure 5.1. By contrast I decided to problematise some of the

key issues raised from the questions that need further investigation by applying a constructivist approach to the interview study. This decision about my research methods reminded me of how many queries in a community pharmacy about symptoms are conducted by a sales assistant. Typically the assistant uses a medicines protocol which is a series of seemingly simple standardised questions that attempt to uncover the problem presented by the customer. In many cases the answer given by the customer is too complex or open ended to fit into the formula presented by the protocol and involves the intervention of a pharmacist. The pharmacist will use their tacit knowledge to ask further questions and engage in a deeper dialogue. This sometimes complex process will determine if the problem can be treated with an available medicine or requires referral to another healthcare professional. There is a parallel with this practice scenario and a research questionnaire that is viewed as a blunt instrument which only takes us so far in our exploration of a problem. The fruitful part of this research process has been an engagement with the individual that goes beyond a superficial response to a series of statements.

CHAPTER 6: INTERVIEW NARRATIVES AND DISCUSSION

The focus of this chapter is to present the findings from the interviews and discuss each theme with reference to the literature and methodology discussed in Chapters 2 and 3. The themes have emerged by the process described in the methods of research in Chapter 4. Each theme is presented in a common format which includes two parts:

- Interpretation
- Reflexive summary

The main part provides a narrative that links my interpretation of the interview data with the literature. In the second part each theme is summarised by a personal reflexive account that aims to highlight each theme within my own reflexive journey.

When considering the presentation of the interview themes I used Figure 4.1 with the overlapping domains of curriculum, knowledge and pharmacy culture to develop Figure 6.1. This is a new diagrammatic representation that draws attention to the tensed zone of pharmacy knowledge which relates to both pharmaceutical science and pharmacy practice. The diagram also links the interview themes to the three areas from the literature review that relate to theory and practice in professional education.

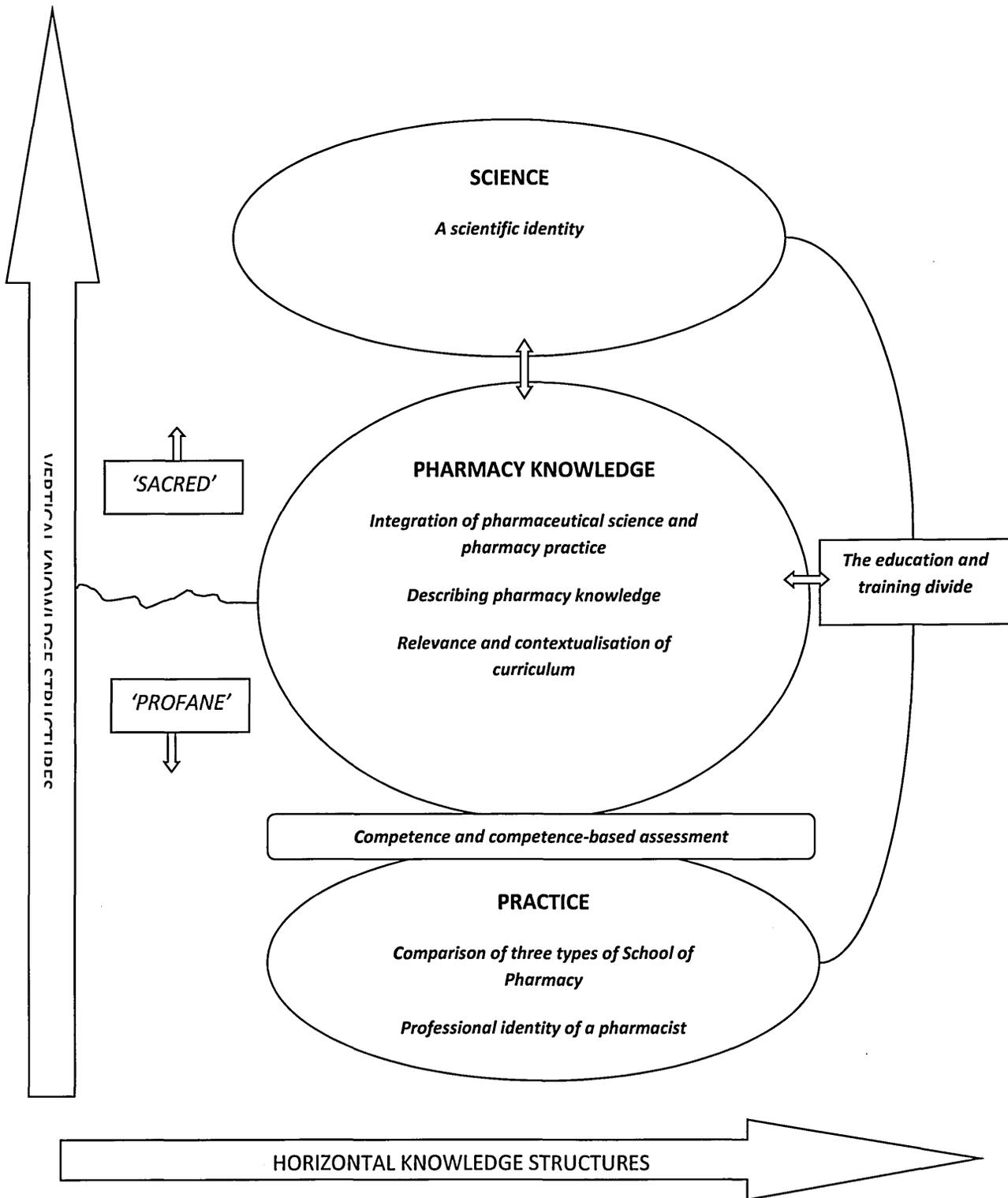
- The centrality of Schön's dilemma of how a professional articulates knowledge in practice as seen in the position of pharmacy knowledge placed between science and 'practice'.

- The Bourdieusian perspective on 'practice' explored through the tension between scientists and practitioners within the School of Pharmacy field
- The use of Bernstein's description of knowledge relations such as reference to vertical and horizontal knowledge across the range of themes

The interview themes are discussed in the following order:

1. A scientific identity
2. Integration of pharmaceutical science and pharmacy practice
3. Describing pharmacy knowledge
4. Relevance and contextualisation of curriculum content
5. The education and training divide
6. Competence and competence-based assessment
7. A comparison of three types of institution
8. The professional identity of a pharmacist

Figure 6.1: A representation of the interview themes



Respondent profile

The profile of the respondents is summarised in Table 6.1. To maintain anonymity, only basic profile information has been included to prevent individuals from being identified.

Table 6.1: Types of institution and interviewee profile

Code for institution	Type of institution and defining characteristic	Code for interviewee	Interviewee profile	Date of interview
N	Post-92 University that has recently established a new MPharm programme and a new School of Pharmacy	N1	Pharmaceutical Scientist Male Aged 50-59	25/05/11
		N2*	Pharmacy Practice Female Aged 40-49	25/05/11
		N3	Pharmaceutical Scientist Female Aged 30-39	25/05/11
		N4*	Pharmacy Practice Male Aged 40-49	25/05/11
T	Post-92 University with established MPharm programme (emphasis on teaching)	T1*	Pharmaceutical Scientist Female Aged 60-69	13/06/11
		T2*	Pharmacy Practice Male Aged 30-39	27/06/11
		T3*	Pharmaceutical Scientist Male Aged 50-59	27/06/11
		T4	Pharmaceutical Scientist Female Aged 30-39	28/06/11
R	Russell Group University with established MPharm programme (emphasis on research)	R1*	Pharmacy Practice Male Aged 40-49	29/06/11
		R2*	Pharmacy Practice Female Aged 30-39	29/06/11
		R3	Pharmaceutical Scientist Male Aged 50-59	29/06/11
		R4*	Pharmacy Practice Female Aged 40-49	29/06/11

*indicates respondent is a registered pharmacist

Theme 1: A scientific identity

Interpretation

The science-based respondents portrayed a strong scientific identity as would be predicted and this is demonstrated particularly by the statement from N1 at the top of Figure 6.2 who makes a strong personal alignment to his subject area. Schön's technical rationality described in *'The reflective practitioner'* as the dominant epistemology, firmly bounded, scientific and standardised (Schön, 1983 p23) is the main perspective portrayed by this theme. Respondent N1 was keen to explain the underlying importance of chemistry and how a background in science is linked to education as opposed to training.

N1: *"But you can't really understand pharmacology unless you have a reasonable understanding of organic chemistry and three dimensional chemistry, at the end of the day drugs are three dimensional models that fit into receptors. So if you want to **educate** a pharmacist **rather than just train them** I think they need a good solid background in various areas of therapeutic pharmacology, clinical pharmacology, a good solid background in ADME* which requires I think a significant knowledge and understanding of organic and physical and analytical chemistry. Occasionally even a bit of inorganic chemistry, with a few drugs."*

[*ADME = absorption, distribution, metabolism and excretion]

It was also clear that the scientists were looking more for a broader application of their subject area to health in general rather than to pharmacy in particular.

For example both N1 and N3 introduced the area of diagnostic testing as an important future area for healthcare that depended on the input of people with a background in chemical and biological sciences.

It can be seen from Figure 6.2 that within institution N the practice-based academic N4 was the least in favour of science and the language suggests that he is a reluctant scientist. However, this view is not reflected by other practice-

based respondents across all Schools as can be seen by Figure 6.3, which shows an overall positive view of science. Again the quotation from N4 (Figure 6.3) as he speaks about science as being knowledge from the past is not aligned to the positive comments from other practitioners. Whilst respondent N4 agreed that science was important, overall he felt that the value of science is of little use if this cannot be communicated easily to the end user (the patient). Science was seen as fundamental to the role of the pharmacist in terms of knowledge of drug action and how this could be translated into personalised healthcare and choice of medicine for the individual.

Figure 6.2: The ascending scale of respondent perception of the importance of science within School N.

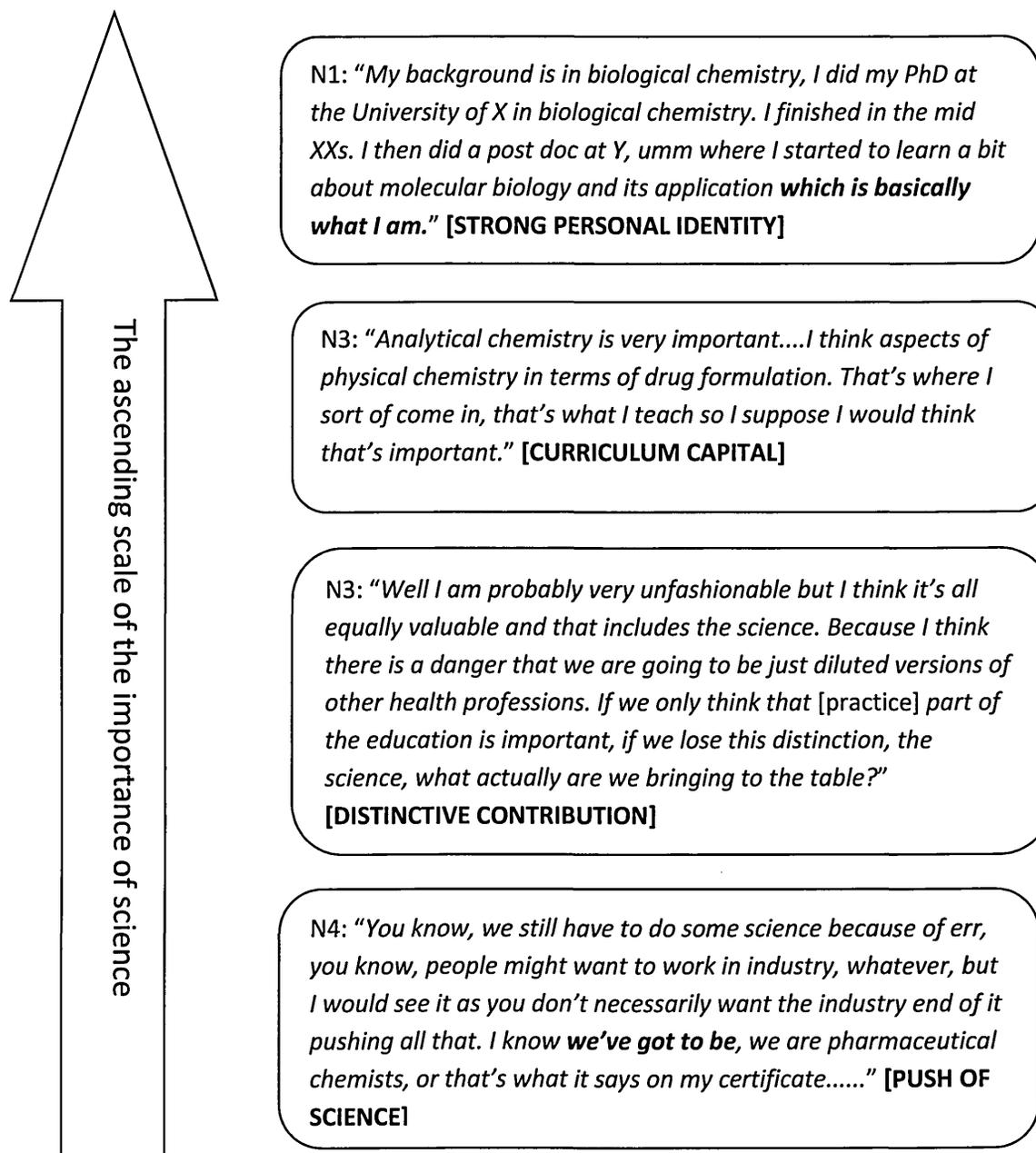
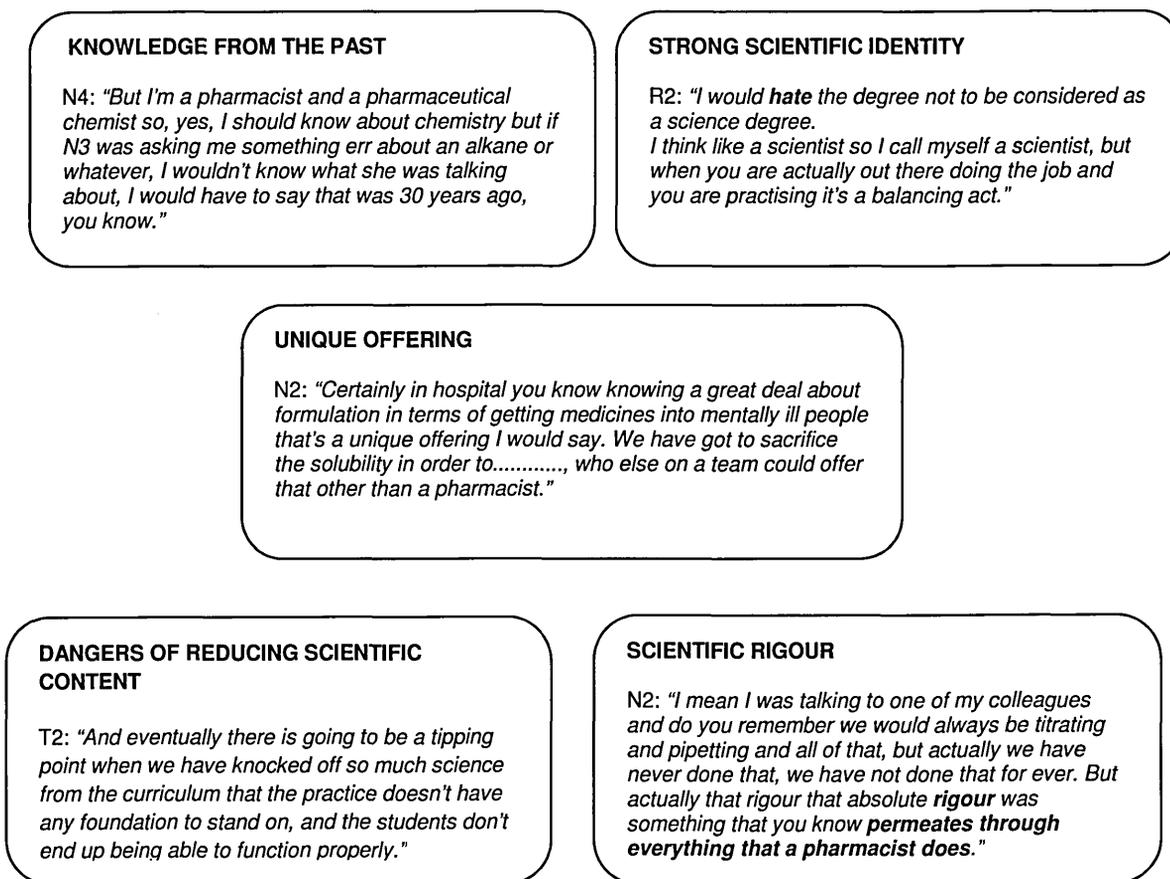


Figure 6.3: The pharmacy practitioner's positive view of science.



Respondent N4 referred to other schools as having a more scientific basis but probably lacking in relevance. This respondent was keen to emphasise that the key role of a pharmacist is to communicate knowledge and be able to relate separate pieces of knowledge within the field of medicines. Respondent N4 implies a more segmented horizontal language when describing science. The ease with which respondents align more closely with Durkheim's description of the sacred rather than the profane as highlighted by Bernstein (2000) is also a key area of interpretation within this theme.

The example was used of managing an anticoagulant clinic and how a nurse would follow an algorithm and adjust the dose of warfarin according to a rigid protocol. The argument was made that a pharmacist running the same clinic would have a more in-depth knowledge of all the other medicines used by the patient and any other issues that needed to be addressed. However, the argument was counteracted to some extent by the same respondent being less enthusiastic about the place of science within the armoury of the pharmacist's knowledge. Respondent N4 also used the example of having scientifically able students with high A-level science entry grades but with very poor communication skills. However, later in the conversation respondent N4 was also keen to defend the position of the pharmacist as a scientist when comparing with other healthcare professionals and scientists.

A record of this dichotomous viewpoint is important as it depicts the identity struggle between scientist and pharmacy practitioner. For this respondent there is a tension that exists between the direct relevance of practice, which somehow diminishes the importance of seemingly abstract science. However, this view is constrained by the recognition that science is a means of raising professional profile and stating that fundamentally a pharmacist is a scientist. The discussion of this theme also draws on Bourdieu's portrayal of scientific capital as all respondents have emerged from a formative scientific education. There is a consideration of the embodied cultural capital of respondents and how this can raise professional status as agents defend their own academic speciality. The mechanisms that orient scientific practice as described by Bourdieu (2004) are particularly relevant in a profession where the move is from pure science to an applied or integrated science.

Pharmaceutical science is viewed as an important area of the MPharm curriculum and all respondents across all institutions defend the high science content of the programme. One of the key areas to emerge from the exploration of science within the curriculum relates to the perceived view of students entering the programme. This is seen for example when respondents were asked if students ever challenge the intensive science content.

R2: *"I think there might be the why on earth do I need to know this, I have done this in my placement and the pharmacists there never use this. But I would hope they had a certain kind of **faith** in us that they **trusted** us that we knew, that we know what's best."*

This quotation implies a somewhat paternalistic view that science is somehow beneficial. The practice-based members of staff communicated a more protectionist view of science than I would expect. It is the science-based respondent R3 who points out that the scientific content of the curriculum in the past has possibly been too intense:

R3: *"How to use a spectrophotometer and run a NMR. As a pharmacist in Boots do you need to actually know that to do their day their day to day job? I think pharmacists that want to go into industry absolutely fine but you can cover these in a specialisation module that they can choose if they think that's the direction they want to go. I think there are aspects that I am not sure they need to know in as much detail as maybe has been taught."*

Some of the summarised arguments used by respondents to justify the emphasis on a scientific curriculum include:

- Practical work engenders useful generic skills such as attention to detail (R1)
- Students need to be exposed to areas that they are uncomfortable with to develop their thinking and analytical skills (R2)
- Students enjoy science practical work even though the work is not directly relevant to their career. For example the extemporaneous

dispensing of different products whilst not performed in mainstream practice gives the students an appreciation of the characteristics of a range of different products. (R1)

The usefulness of a curriculum based on scientific principles is a clear message from across all respondents. Respondent R2 who is a teacher-practitioner would “*hate the degree not to be considered as a science degree*” and is also keen to justify the science content in terms of future practice:

R2: “*Yes when I think about things the students will do when they go into practice they will see reps they will come in and they will show them papers, this shows this. And they have got to be able you, you know, to question and critique, I think that is fundamental.*”

It is notable that the majority of positive science comments come from a pharmacy practitioner rather than a pharmaceutical scientist. The scientist R3 is more cautious in his view.

R3: “*They sometimes question why they need to know about how a gamma radiation plant works, I would question that to be honest! It’s something that’s been inherited and passed down……. We have tried to trim it down to what we feel almost acts as a foundation for the clinical side or practice.*”

The importance of a scientific education rather than a more practical and applied training process is echoed by respondent T2 who teaches practice but has a strong scientific academic background. Respondent T1 describes her view that students perceive the theoretical science as lacking in relevance for their future role. The argument used by respondent T1 is that if these fundamental principles are not in place this will have an impact on future choices for the student. This respondent looks back at her own pharmacy education and describes the value of her formative scientific background.

T1: *"I still use my notes because the depth that had been gone into about chemistry and the pharmacology was absolutely superb, the depth was fantastic. And the breadth of it was pretty good as well, but the depth was really developing so that I felt at the end of it I had developed lots of thinking powers, I could dissect a paper and use what I had learnt to understand and extend it. I really did feel that they did such a good job in **educating**....."*

Respondent T4 is extremely candid when she states a pragmatic reason for not losing any more of the scientific curriculum.

T4: *"Well there is the obvious worry that people think if we haven't got any lectures we are not going to have any jobs. So people are protecting their own corner as well"*

However, this practical reason is not expanded and this respondent is keen to justify the scientific content of the curriculum and describes how students find this more relevant as they progress through the programme. This respondent also makes it clear that there should be no further loss of science from the curriculum.

T4: *"I think we have got to be strong and say no there is a certain level that we shouldn't go below. And I don't think we are particularly heavy on core science compared to other courses we don't do hugely too much. Maybe some of the practicals could be streamlined a bit more so we do less examples to make room for more placements. But I think the core understanding should stay, otherwise they are not going to be able to understand the bits later on."*

Having explained that the pharmaceutical chemistry content of the MPharm programme has gradually been reduced over a number of years, respondent T3 explains the value of this subject area within a pharmacy programme.

T3: *"What I am trying to do is get over general chemical principles of how people try and fit molecules to the receptor, or how they improve drug molecules.And the most important thing we do in pharmaceutical chemistry is the partition theory. And because that is all about when drugs dissolve, if they dissolve, where they dissolve, and can they be absorbed or excreted and can they be transported around the body."*

Respondent T2 is also very supportive of a rigorous scientific education and uses the area of extemporaneous dispensing (where a range of pharmaceutical products are prepared from raw materials) as an example of the usefulness of science. The process of preparing products in this way is seen as a valuable part of the education of a pharmacy student.

The overall importance and value of fundamental science to the future pharmacist is communicated clearly by all respondents irrespective of their academic background or institution. Science is seen as a fundamental part of the armoury that supports the pharmacist in his/her claim to professional status. One of the main reasons why science is seen as essential to pharmacy is the application of knowledge and the contribution that the pharmacist can ultimately make to patient care. A clear outcome from the research is that there is a certain amount of tension for the practitioners who are engaged in academic practice as they clearly recognise the power of their own scientific knowledge but are not directly involved in the delivery of science. For the scientists this tension is less acute as they are more engaged in a totally scientific paradigm and able to compartmentalise practice as an area that science can be applied to. This difference in 'science' and 'practice' culture within a School of Pharmacy will be explored in the next theme. The importance of science links clearly to Välimaa's statement that pharmacy is multidisciplinary (Välimaa, 1998). The multidisciplinary nature of pharmacy is a strength but also a challenge for academics where various components are being eroded from the curriculum. In contrast to the questionnaire study, the interview narratives describe an underlying scientific rigour where science permeates all that a pharmacist does, which is a strong image to emerge from this theme. This

clearly links to a technical rationality as a dominant epistemology as described by Schön (1983). The main outcome from this theme is that an appeal to scientific identity strengthens the claim to professional status.

Reflexive summary

Homoeopathy is a controversial subject within any scientific academic community. The main reason for this is that it is a system of treatment that does not depend on a pharmacological paradigm that relates to molecules of active ingredient, receptor sites or modes of action. The NHS website acknowledges that homoeopathy remains available on the NHS though it is unproven as a treatment (NHS, 2010). This is not a subject area I wished to discuss as part of my research, mainly as it is not directly relevant to my research questions. It was therefore, surprising to me that 3 of the 12 respondents introduced this topic into the interview conversation spontaneously. This was unexpected because in each case it appeared out of context and was used as an opportunity to define the difference between the science and practice-based academic.

A clear example of conflict between a science-based respondent N1 and the practice-based respondent N4 was when this subject was brought into the conversation by respondent N1. This subject arose when discussing possible words that could be used to describe a pharmacist. The word 'rational' was used by N1 who then expanded to give his view on homoeopathy.

*N1: "Rational, unfortunately I am afraid there are some community pharmacists who even in this school think it is perfectly appropriate to teach homoeopathy. Umm for which there is absolutely no evidence we, and I am **afraid for a chemist that is sort of red rag to a bull.**"*

At this point the clearly defined 'objective' scientific culture is not far from the surface of the interview narrative and is in direct contrast to a practice culture where a range of social factors are seen as important in the way that medicines are perceived and taken by the public. From a personal perspective this is one of the key areas of difference between science and practice and will be explored more fully in the discussion of the next theme.

There was more of an undercurrent of comparison between science-based academics and practice-based academics at institution N. Early in the interview the issue of conflict within the academic community was raised by respondent N1 when he stated that there are essentially two cultures present within the room.

N1: *"I think there is some difference because there are two cultures in pharmacy, of which basically those two cultures are in this room i.e. you and me, the scientific culture and a social err community culture."*

I found this direct statement quite unsettling as it is a conflict that is clear but kept below the surface and rarely discussed in explicit terms. He expanded his view by talking about his experience of an inter-professional teaching exercise that required academic staff from different disciplines. He described how the science-based members of staff had a 'reductionist' approach and reduced the problem they were faced with to a series of stages and delegated discrete tasks to different members of the group. By contrast the practitioners (representing the social/community culture) tackled the problem completely differently by looking more holistically at the problem and drawing in views from all members of the group. In describing this experience respondent N1 stated that the thought process of the science-based member of staff compared to the practice-based member of staff was very different. He concluded that this type

of conflict is useful, using the analogy that without friction a car would not be able to move. It is notable that all of the interviewees were keen to stress that the department was happy and the light hearted dialogue between subject groups was not really significant. Respondent N2 stated that when science-based staff used comments such as: "*you are not a scientist you are a pharmacist!*" this was nothing more than an acknowledgement of differences of opinion rather than a deeper underlying difference. The interview narrative describes a subtle conflict within this academic community that whilst not negative, would benefit from a greater airing than it is currently given, to support a deeper understanding of how these different insights impact on approaches to pharmacy education.

The science-based respondent N3 summarised the difference as:

N3: "I think there is a different way of thinking, because we are trained in a way to think very black and white. And in pharmacy practice I think it can be very colourful in how perhaps you interpret things, it's not always right and wrong, a spectrum. And I think sometimes the science we try to know, it's either yes or no."

When I first started work in a School of Pharmacy I was surprised to be introduced to people as a 'practice person' as a way of identifying and distinguishing me from colleagues engaged in the teaching of science. This seemed a false label where science and practice have a separate identity. I would be more comfortable being described as a pharmacist than a 'practice person' as the term pharmacist suggests more of a hybrid identity than an artificial distinction between science and practice. It is important to note that pharmacy education uses the labels of 'science' and 'practice' but the label

'pharmacist' is not clearly understood. This leads to the consideration of how science and practice are integrated which is the next theme to be discussed.

Theme 2: Integration of pharmaceutical science and pharmacy practice

Interpretation

The integration of science and practice is at the heart of Schön's '*reflection in action*' which involves thinking on your feet and improvisation. There is a natural tendency towards safer technical rationality and what Schön describes as a "*lack of reflective conversation with the situation*" (Schön, 1983 p268). Schön challenges the principle of integration where knowledge from research is integrated into the professional curriculum and draws attention to outstanding practitioners who are described as having more wisdom, artistry and talent rather than professional knowledge. Integration of subject material across teaching teams is important across all institutions. The new school perception was that they were in a stronger position to achieve this ideal than the more established schools. However, the modular design of degree courses where elements of curriculum content are separated out is viewed as a barrier to integration.

N2: "Our course is modular so everything is divided into modules so we don't help ourselves. We are saying we are an integrated course but because we deliver modules we then separate it out. And that creates a false division and that is just to do with teaching teams, you know, this module will be run by people from pharmacology, this will be run by ... and I think that's very dangerous."

The view of members of School N is that individual modules can be integrated and this can be seen quite readily in areas such as the linking of cell biology theory and the mechanism of action of antibiotics. However, it was acknowledged that there are areas where the integration of science and

practice seem a little strained and links can appear artificial, particularly with some of the more theoretical principles of physical science and everyday practice. There was the suggestion that integration is a challenge but this can be overcome by studying the same area repeatedly but within different disciplines. For example the theory of local anaesthetics can be looked at from a physiological, biochemical and pharmacological viewpoint.

N2: "In the first year, they do local anaesthetics, they will do it in physiology, they will do it in chemistry and they will do it in biochemistry. So they will do the same area in three different domains. And of course that's the beauty of being a new department, because rather than we have always done this, actually there was none of that it was this is how we are going to do it across, and it is good."

The assumption made by the new school was that they are in a stronger position to achieve integration as there are less established teaching teams and a greater likelihood of individuals working together. This quotation also underlines the 'blank sheet' culture of School N described later in this chapter.

The view stated could be challenged in that true integration is about breaking down subject areas and disciplines so that the area of focus (local anaesthetics) transcends separate subject areas. Ideally links need to be drawn between subject areas in order to be able to study the area with greater depth and insight. Conversely it could also be argued that different subject groups produce different social constructions and this adds to our overall understanding of an area. There is some hesitation from respondent N4 when asked about the integration of the programme.

N4: "Yes, no, we've got, actually it works quite well. We've got a pharmaceuticals team and a chemistry team and then the practice team's the biggest. But umm it works quite well because we, most modules we have maybe one or somebody from another part of, like all of the medicines and

professional practice have somebody from a different discipline included to ensure it's a sort of a holistic practice."

Numeracy was a skill area that was cited as a useful tool for integration by both respondents from School N with a science background. The opinion was expressed that numeracy and patient safety are inextricably linked and more needs to be done to support students in this area. This emphasis can be linked to Bernstein's genericism (Bernstein, 2000) in the form of key skills to improve integration of subject knowledge.

N3: "Yes actually an understanding of how to accurately interpret data you get from analytical techniques. If they are improperly interpreted that can mean something different than if you really understood, you know, the background correction to what a number actually is. To versus just getting something from the instrument and it might not be the true number. So kind of being devil's advocate and making sure you understand that accurate is a real representation of what is happening versus something that might just be an error. So I think that skill is important not only in data instrumentation but also in other aspects of the practice."

This respondent also made it clear that scientists and practitioners do not always understand the role of their colleagues.

N3: "I think as far as kind of the process of running modules and teaching and things yes we are on the same page. But our career paths are very different and sometimes I think we may not have an appreciation of what the other one does as much....."

The scientific emphasis of the established curriculum within pharmacy education compared to the expectation from within the profession for a more clinical MPharm is a notable tension within the interview narratives. This naturally leads to a discussion of curriculum integration between science and practice as a means of addressing this specific issue. Overall, the respondents agree that integration is an important direction of travel but a number of

problems are raised with this approach. For example some parts of the science curriculum are more difficult to integrate with practice than others.

R1: *"I think the key areas are probably around pharmaceuticals those are the easy bits, and I think some of our science topics can be difficult.....we do want them to get an understanding of these groups and functional groups of a molecule but that can be difficult I think to see."*

When respondent R2 is asked about integration, the response is more negative and the division of scientific and practice identity is more obvious.

R2: *"Currently it's not, I work in practice, urm and I do help out with some microbiology that's about the only integration I have come across."*

This response is expanded by explaining the usefulness of working with colleagues from different disciplines but this respondent holds the view that it can be a difficult process. The science-based respondent R3 also had some reservations about integration:

R3: *"I think it is, urm, where appropriate. I think there are some, I can see there are probably some areas that it might be difficult to do it, and it would be wrong to **force** that integration where it's not natural. I think there are some areas you can see a natural affinity."*

The concept of 'forced' integration describes a recognised division between disciplines and suggests that there needs to be a more natural and organic approach to integration. The use of the term 'force' also appeared in the narrative from respondent R4.

R4: *"And I think we're kind of **forcing** it here, that's my kind of impression."*

However, R4 also makes it clear that the more traditional two plus two model where the science is covered in the first two years of the programme and practice in the second two years of the programme can be problematic. For example the undiluted pure science at the start of a programme can have a negative effect on the motivation of students. The new degree course being

developed at institution R in common with all new MPharm degrees is more integrated where the aim is to make the links with practice more explicit.

An important sub theme to emerge within the discussion of integration is that integration involves the integration of people and is not simply about integration of different subject disciplines.

R4: *“Because I think we can’t just put the **blame** on the scientists and say but they don’t teach our students and show them how it relates to practice, because actually they might find it hard to see all of those links. So by bringing two or a number of people from these two areas together I think we can work together and so oh this is where the links are, this is, you know you may find this helpful, why don’t you use a pharmacy example rather than a pure chemistry example when you teach that particular thing....”*

The emotive reference to “*blame on the scientists*” confirms the difference between the practice and science teaching team. Respondent R1 commented on improved integration by the inclusion of practice staff in developing a science-based module or a scientist having an input into a practice-based module.

R1: *“Yes the pharmacists did go and they helped the scientist when they designed their teaching..... where we have worked less well is going the other way.”*

Using a Bourdieusian outlook the study of a School of Pharmacy field requires an appreciation of the dispositions of individuals and this is seen clearly in the differences between scientists and practitioners. As part of the literature review and my reflexive approach I have already considered potential scenarios in a School of Pharmacy that relate to Bourdieu’s field theory. The increasingly blurred edges of science and practice and the way in which the autonomy and position of science is threatened by social interests described by Bourdieu

(2004) in *'Science of Science and Reflexivity'* offers useful insights for the discussion of knowledge integration in a culture dominated by a scientific identity. Clearly there is an issue with the direction of integration when this involves using different people, where movement of practice into science is viewed as more effective than the reverse move of science into practice. The science-based respondent R3 viewed this as more of a numbers issue where different subject specialists are not evenly balanced and this can lead to problems. For example when speaking about the pharmacy practice team they are described as thinking very differently to the science-based members of staff.

R3: *"They can, they can think very differently. I think its err a bit easier when you are down to you know four or five individuals in a small group, as against the X [science discipline with only one member of staff] team **versus** pharmacy practice."*

The modular organisation of the degree programme is viewed as a barrier to the fuller integration of science and practice and this is highlighted by respondents T2 and T4.

T2: *"And X [name of colleague] sat in with me last year and was surprised with them not having a clue about what we were talking about, despite them having done it for two or three years with him, and they were sitting there saying oh no we have never done anything like this before. And it's because it's a separate module and they **compartmentalise** it, so last year's stuff I don't need to know any more. And worse than that was last year I was having a discussion about blood pressure and diabetes where they are actually concurrent modules running together but they were different modules and the students weren't thinking what I learnt in that one was applicable to this one."*

The problem of a lack of integration is seen by respondent T4 as partly a student responsibility to be able to make links within and between modules. Integration should not be seen as the sole responsibility of the programme team. This respondent cites one problem with modularity as the necessity to give feedback which can generate a lot of assignments and results in an

impractical workload for staff teaching a large cohort. A more realistic option is for integration of work that is both horizontal (across a year) and vertical (throughout the programme) to provide a more holistic learning experience.

T4: "And I think one of our problems is sometimes we don't always have enough confidence in our students, or we are not prepared to put the onus on them to learn for their own sake, rather than us saying well if we don't teach and assess it the students will not learn it. That's maybe a culture change we need to make so that there is more onus on the students doing it for themselves and less onus on making sure the staff teach it....."

The view is also expressed that integration needs to be earlier in the programme in order to avoid surface learning.

T2: "I think more the types of questions we need to ask need to be more integrated from the very beginning. And it shouldn't be the case that you can just get through your first two years just by learning lecture notes and regurgitating them in a vague fashion....."

One of the concerns over integration is that it is possible to over integrate and the programme content becomes fragmented.

T4: "I think the danger is if you try to integrate it too much it becomes very bitty and unless the modules are very well organised you end up with they are doing a bit of this and a bit of that, rather than just see the overall relevance. Unless it's timetabled really well and it can follow on properly I think it can end up a bit messy....."

The pragmatic issue that good integration is very dependent on people working well together is also highlighted.

T4: "I mean there is a difficulty if you have too many people on a module and it's difficult to work out how everything is going to fit together.....and you have got to get everyone to work together as well which is a challenge. Getting us to all do the same thing is not very easy."

The interview narratives on integration have opened up some useful insights into the world of pharmacy education and potential future implications for the pharmacist in practice. Whilst there is a need for the use of tacit knowledge

within the pharmacy profession there is a question mark over whether a modular approach to the delivery of a pharmacy programme is favourable for the inculcation of this type of knowledge. Integration is a key area of interest in trying to gain an insight into pharmacy knowledge in relation to the pharmacist and his/her world. The Mode 2 knowledge referred to by Gibbons (1994) where knowledge is created within a broader, transdisciplinary social and economic context is dependent on close integration and co-operation between different subject disciplines. This ideal needs to be brought more to the fore of thinking in pharmacy education where Halliday's (1987) syncretic knowledge describes the amalgamation of both descriptive (scientific) and prescriptive (practice) based knowledge. The interview narratives highlight some of the pragmatic problems that impact on the achievement of this ideal integration. Practical issues such as how module teams work together, understanding the different roles across the science/practice fence and the 'direction' of integration may all affect the ideal of a closer integration of pharmacy knowledge. There is a sense of interest-based interpretation of socially constructed knowledge as described by Young (2008) as different subject specialists can identify a problem and the integration issue is viewed as both a problem and a solution. One of the main difficulties associated with integration can be highlighted by referring to Bernstein's vertical and horizontal knowledge discourse (Bernstein, 2000). An integrated pharmacy module attempts to integrate vertical scientific knowledge and horizontal practice-based knowledge. The image of a triangle with a broad base leading to a powerful apex within a vertical discourse suggests that integration is more likely at the lower levels but this becomes more difficult towards a more abstract apex. For example a 'vertical' scientific area such as chemistry that follows strict rules, sequence and pedagogy may be linked to 'horizontal' practice of using

chemical knowledge to apply to the practice of antibiotic prescribing. Both types of knowledge are important but the approach used for each type is not necessarily compatible within a modular structure. Bernstein's vertical and horizontal discourse also offers some insight into the direction of integration where practice into science is viewed as more feasible than science into practice. The interview narratives suggest that horizontal, segmented knowledge can be transferred into a vertical hierarchical knowledge structure, whereas the reverse journey where more abstract theoretical knowledge is placed within a practice-bound context is difficult to achieve. The terms used by Bernstein of a singular that faces inwards and a number of singulars that amalgamate to form a region of practice is a useful model for pharmacy education. Bernstein's description of singulars and regions can also support our understanding of integration with increasing genericism as a form of glue in bringing together science and practice. The key issue is that the region faces outwards towards a field of practice. It is important that if a modular structure is used that there is a clear relationship with practice. It would appear that within pharmacy education the term practice is too narrow in that it can be seen as relating to practice in the academic sense (teaching of practice) rather than the wider area of work of the future pharmacist.

Reflexive summary

From a Bourdieusian perspective the integration of science and practice is a challenging ideal as the scientific subject specialist and pharmacy practitioner occupy different spaces within the pharmacy education field. The habitus of the teacher-practitioner is very different to that of the laboratory research scientist. Consequently the unconscious accumulation of social, cultural and knowledge

capital is different for these different players. Many of the moves to integrate science and practice within the pharmacy curriculum are superficial. Examples such as the inclusion of scientists and practitioners on modules outside their own subject area and the combination of science and practice content within modular schemes do not fully address the challenge of integration. A more positive approach to integration could be achieved by a greater awareness of the habitus of individuals within the field.

The modular argument such as the one outlined by Jenkins and Walker (1994) describes many advantages of using modules on a degree programme, such as improving learner autonomy, student choice, flexibility and adapting to new modes of learning and assessment. The main disadvantages of the modular approach centre on the lack of cohesion of the student experience (Billing, 2007). A curriculum that is commodified as discrete packages of learning is linked to outcomes-based assessment. Hussey and Smith (2003) argue that learning outcomes need to be reclaimed from a monitoring and audit function and returned to the more supportive purpose of improving teaching and learning. Their paper distinguishes between different types of learning outcomes such as predicted (intended) and unpredicted (emergent) learning outcomes. There is a concern that an uncritical acceptance of prescriptive, standardised outcomes will create *“cynical, instrumental attitudes to learning in teachers and students alike and remove critical dimensions of student-centred learning from higher education.”* (Ecclestone, 1999 p29). In an article on the modularisation of nursing programmes Gass et al.(2004) question whether a modular framework prepares students for their future professional practice.

The discussion relating to modular degree programmes and the integration of science and practice has caused me to reflect on my own experience as a student of pharmacy. The pharmacy course I studied did not have a modular structure but the work each year was divided into broad subject areas such as pharmaceutical chemistry, pharmacology and pharmaceutics. There were no explicit learning outcomes or overt links between subject areas. However there was an expectation that students would read around an area to ensure that they understood how knowledge linked together. For example it would be necessary to revisit aspects of physical chemistry in order to be able to understand some areas of formulation covered under the broad subject title of pharmaceutics. Looking back it was the open-ended approach of having a subject rather than a modular heading that encouraged a more holistic approach to individual learning. My experience as a student (open subject approach) and later as a teacher (modular approach) has consolidated my view that modularisation is the enemy of true integration of knowledge.

Theme 3: Describing pharmacy knowledge

Interpretation

The focus of this theme is my interpretation of how respondents describe knowledge. Schön's observation from '*The reflective practitioner*' (Schön, 1983) that professionals find it difficult to articulate the areas that lead to professional competence rings true during the analysis of the interview narratives. It is clear that all participants had quite different perceptions about knowledge in relation to pharmacy. In general the practice-based academics view knowledge as something that has ongoing application to a specific problem and this could be labelled as a pragmatic approach to knowledge. Pharmacy knowledge from the

practitioner's viewpoint is seen as fluid and changeable and applied to an unpredictable and changing practice. For example respondent N4 described knowledge by referring to the principles of continuing professional development (CPD) and the theory associated with the CPD cycle of reflection, planning, action and evaluation. There was the discussion of practising pharmacists that attend a continuing education event and may feel that they are 'knowledgeable' about a particular area but have not yet applied this learning to practice. Such lack of action and application was viewed by this respondent as the extreme opposite of how knowledge must be embedded in application for it to work. This view echoes the criticism of Kolb's learning cycle (Kolb, 1984) discussed earlier where the cycle is viewed as a series of distinct stages. This respondent does not refer to Kolb's cycle directly but describes a series of blurred stages which must blend together in order for knowledge to be brought into practice. By contrast the science-based respondent N1 spoke repeatedly about 'knowledge decay' and the retention of knowledge, suggesting that remembering and retaining information is important. Using the example of pharmaceutical chemistry he suggested that after graduation there would be the decay of knowledge to the point where there would be little 'knowledge'. This scientific view echoes Schön's description of the dominant epistemology of practice as 'technical rationality' (Schön, 1983).

Overall the science-based respondents are more concerned with learning discrete areas of work rather than application to practice. Respondent N1 justified his view somewhat by stating that it was only by learning disparate pieces of knowledge that the student was in a position to develop their knowledge and create new knowledge. Table 6.2 describes the key contrasts between how knowledge is described between science and practice-based

academics. This table also shows that there is some common ground as both scientists and practitioners describe the importance of application of knowledge and the translation of scientific principles into practice. It is significant to note that this common ground is particularly evident in respondents T1 and T2 who have a hybrid background as they have links with practice but have an academic scientific background. Respondent T3 who is a pharmacist but teaches pharmaceutical chemistry makes it clear that scientific knowledge in the past has been too dependent on memorising a number of unrelated facts. Instead there should be more emphasis on the action and uses of drugs and placing science (in this example pharmaceutical chemistry) into an applied context.

T3: "Students shouldn't memorise structures, chemical structures, you know. If I can't remember them, if I want a chemical structure you look it up. So that's one of the bits where I think at one stage people used to memorise structures, they would memorise melting points, memorise all sorts, but I don't think you can do that.....I think the emphasis now is more on how the properties of the drug influence its action and uses. Rather than just how do we make it. So we do a lot less pure organic chemistry..."

Table 6.2: Differences in how knowledge is viewed between the scientist and the pharmacy practitioner

SCIENCE	PRACTICE
<p>Knowledge decay (Knowledge is acquired and decays)</p> <p>N1: <i>"Their knowledge of chemistry will start decaying as soon as they have graduated, and in five or ten years down the line they probably won't remember very much."</i></p>	<p>Knowledge is ongoing and utilised according to the requirements of practice (Continuing Professional Development)</p> <p>N4: <i>".... I have known lots of people that used to come along to a workshop that really should not have been practising but because they thought by coming to a workshop that, and they got that certificate and they've stuck it on their wall, that they were somehow very knowledgeable, but I don't think they could apply it."</i></p>
<p>Large unique and broad body of knowledge</p> <p>T3: <i>"Pharmacists do actually have a tremendous body of knowledge. We have a breadth of knowledge that nobody else has, you will find chemists who can tell you more about synthesis of drugs or analysis of drugs, and they will often seem to have a greater depth of knowledge. But you will then find they don't have the pharmacology, they don't have the understanding. You have pharmacologists who have very deep detailed knowledge of the action and use of specific groups of drugs, they are not as good at other things."</i></p>	<p>Importance of being able to access rather than learn a body of knowledge</p> <p>R1: <i>"As a school here we have focused heavily on knowledge and knowledge was a big part of our curriculum. I have been arguing for some time that and it's not that knowledge is unimportant but I think that there is a lot of knowledge which is available and readily available but a big part is being able to access it, that is actually very difficult."</i></p>
<p>The vital underpinning of science</p> <p>T4: <i>"If you lose all the underpinning of the science then you might have a superficial knowledge or very people skills, or be able to dispense really well, but when people come to you with a more challenging question they expect you to be able to explain things and you are going to find it very very difficult as a pharmacist if you haven't got that underpinning."</i></p>	<p>Communication in a practical setting</p> <p>R2: <i>"I hopefully get them [students] to speak out loud this is how you use an inhaler and this is how you use an oral syringe, so that when I send them on the summer placements or their Pre Reg and then on to be a pharmacist you know they can string a sentence together and actually explain that. It's all good them knowing the theory but we know that they can actually verbalise it in a way that someone can understand."</i></p>
<p>Common ground: Application of knowledge (the translation of scientific principles)</p>	
<p>T1: <i>"Somebody came in one time, it was 3 or 4 years ago now, and asked why the dose of his atenolol at 25 milligrams was 10 times the dosage of his bendroflumethiazide, and he was an engineer. Now I am not convinced that our students could handle that..... And if a doctor was to come and ask that same question, which they easily could, I am wondering how many of our students would fare."</i></p>	<p>T2: <i>"I think where pharmacy is different from most other degrees in that it's also a sort of an apprenticeship, it's quite a practical subject and you do need to apply pretty much all of it. And the students need to know things when they leave that they didn't even know existed when they started. So from that point of view it's definitely an education. They also need to have practical skills and the ability to apply the knowledge they have got which is more of a training issue. But I don't think it's either/or those, I think its holistic it's a five year apprenticeship for doing something rather than a four year education and one year training."</i></p>

The difference between the scientific and practice view was particularly obvious in the discussion of knowledge. For the scientist, knowledge was often equated with memory and a certain amount of learning and is seen as essential before being able to apply and use knowledge to develop a subject. There was the suggestion of trying to make pharmacy students run before they could walk, by asking students to make applications before they had sufficient underpinning knowledge. The practice view was more about knowledge as a discovery process and how the current career of pharmacy has become unrecognisable when compared to the respondent's own experience of qualifying as a pharmacist. This view was encapsulated in the observation that the more you know the more it uncovers what you do not know and how students find this a difficult concept to embrace, following on from a very prescriptive A-level programme.

A clear theme from the respondents at institution R was that the scientific content and understanding of the pharmacist is what makes his/her knowledge unique. This adds weight to the prime position of science within the MPharm curriculum and the view that a scientific foundation is vital for the future pharmacist. It is important in the narrative to differentiate between the meaning of the term knowledge for different respondents as there are some differences between the way this term is discussed.

For example respondent R3 spoke about the "*distilling of science*" to what the pharmacist needs, which implies a reductionist approach to knowledge. For respondent R4 a key issue is the importance of students being able to access "*information*" rather than the teacher giving information. Respondent R2 speaks of knowledge as something that goes beyond the MPharm programme and is a

distinctive feature of the qualified pharmacist in terms of their attitude. This respondent speaks of attitude towards knowledge as a distinguishing feature once the pharmacist has qualified and divides pharmacists into two broad groups. One group wants to expand their knowledge and consequently their practice whereas the other group is content with the knowledge that they have on qualification and are resistant to the principles of continuing professional development.

Bourdieu(1992) makes the observation that practice is often described negatively as it is seen at a lower level than logic or discourse. This observation is useful in the interpretation of how pharmacy knowledge is described by individuals in the pharmacy field. During the interpretation of the interviews I have attempted to gain some insight into the individual perspectives by drawing on Bourdieu's concept of individual habitus. In many cases the artificial opposites of science and practice are used as a vehicle to understand the individual but this is recognised as a blunt instrument. The polarisation of the 'scientific' and 'practice' viewpoint is evident within the interview narratives and there is a clear indication that the scientist and the practitioner have a different habitus and mode of operation within their field. For example the term knowledge decay indicates a culture of objective knowledge whereas the practitioners more fluid descriptions of knowledge are more in harmony with Mode 2 knowledge as portrayed by Gibbons (1994). Bernstein's horizontal and vertical knowledge model (Bernstein, 2000) can also be applied to the differences seen in how knowledge is described by different academics with the practice-based academics presenting localised horizontal knowledge whereas scientists present a more vertical hierarchy of knowledge.

A particular strength of the interviews is that respondents often stated a particular viewpoint or scenario that indicated a particular stance on how they viewed or described knowledge. Some examples are summarised in Table 6.3.

The first illustrative quote in Table 6.3 that describes the problem of antibiotic resistance highlights the importance of communication of knowledge and knowledge being able to work in practice. This involves being able to overcome medical dominance as described by Freidson (2006) in order for knowledge to be utilised for the ultimate benefit of the patient and also being able to respond appropriately to prescribing pressure. This high level skill is not something that can easily be incorporated into an undergraduate programme as it involves substantial practice and reflection in order to gain confidence in this complex area.

The second quotation depicts the under utilisation of knowledge and the frustration of respondent T1 at her lack of autonomy within the pharmacy profession. This is a significant issue within the profession and again medical dominance is one of the significant barriers to making pharmaceutical knowledge work in practice. This is also associated with the professional frustration reported by Boardman et al. (1999).

Table 6.3: Personal views that describe knowledge

Viewpoint	Quotation
<p>Communication of complex issues</p> <p>Confronting the problem of antibiotic resistance and the pressure to prescribe and supply broad spectrum antibiotics is dependent on scientific knowledge and being able to communicate effectively with others.</p>	<p>T4: <i>"I think they should be concerned with the patient, there are occasions when being concerned for the patient might be in conflict with being concerned with patients in general. And I think they need to be mindful of that, where is the greater good of something. Things like antibiotics prescribing policies, you know that if the doctor has decided that they want to have an extremely broad spectrum antibiotic in this case, even in a specific infection, that's good for that patient because that's definitely going to wipe out what is causing the problem for them. Urm from that patient point of view everything is fine. Whereas if you are looking at it from the pharmacist point of view he might be thinking well that's unnecessary, you know what the causative organism is or its likely to be you should be using something with a narrow spectrum. So in 15 years time we can still use the broad spectrum of antibiotics and it hasn't developed as much resistance as would be the case if we just used it for everything now."</i></p>
<p>The under utilisation of knowledge</p> <p>Frustration and not being able to use knowledge in practice and a lack of autonomy</p>	<p>T1: <i>"And I wanted to be making decisions and I realised that if you were a pharmacist you were going to have to do what you were told, and the prescriptions were going to come in, you were not actually going to have any input into anybody's decision making. And I just couldn't bear it, I just thought I have done all this and I'm going to be stuck just following instructions."</i></p>
<p>Teaching methods responsible for a lack of knowledge</p> <p>Poor previous knowledge and techniques for student learning perpetuated within the university system</p>	<p>T2: <i>"People aren't learning as much and I think quite a lot of that is to do with how students are taught. Not just at university but actually prior to that with everything being very modular and you have a test and you just need to learn for that test and you can completely forget it. And that doesn't work too badly for GCSEs and A levels so they can get the grades they need for that but they are not actually learning anything. And so they come to university not really knowing much because they have just cram learned it for the exams or they didn't do it in very great depth and were coached for doing exams. So they have got poor knowledge to start with and the techniques by which they have been learning they continue at university, and to some extent we let them get away with it."</i></p>
<p>Unique knowledge within the pharmacy profession</p> <p>The specialist knowledge of the pharmacist and the importance of being able to apply this knowledge</p>	<p>T2: <i>"So quite often its doctors they are speaking to, doctors don't know anything about pharmacy, it never even crosses their mind that the tablet they are giving to patients have anything other than drugs in them and there is anything in the coating that might cause a problem for whatever condition the patient has. Equally very very limited knowledge of pharmacology, no knowledge of pharmacokinetics really, other than it exists, so if they had to calculate individualised dosage regimes or something it's a complicated thing to do. And it's not something that you can just sort of as a pharmacist think alright I know how to look up things on the internet I will just quickly go and teach myself....."</i></p>

The third quotation where respondent T2 expresses his view that the method of learning at school for exam preparation does not prepare students for the type of learning required on the MPharm programme. This comment can be linked to the problems associated with the commodification of knowledge. The commodification of knowledge as described by Abbot (1991) where knowledge is treated like a product that can be packaged conveniently into appropriate pieces rather than taking a more holistic view of a curriculum. A programme that is designed to result in a practitioner will require an emphasis on tacit knowledge as well as the more obvious focal knowledge and this is implied by the view of this respondent. The final quotation draws attention to the unique nature of pharmacy knowledge and how when the pharmacist is communicating with a doctor there is a knowledge gap and it is the skilled practical thinking as described by Scribner (1986) that is required for a successful outcome.

Reflexive summary

In the writing of this section and examining various ways in which pharmacy knowledge is described I have been reminded of an incident that occurred during my own pre-registration training in a hospital pharmacy. I was dispensing a bottle of eye drops and was intrigued to see that the manufacturer of the product referred to the plastic eye drop bottle as an 'occumeter'. I mentioned this to a colleague and commented that I could not see any difference between an eye drop bottle and an occumeter. It appeared that the manufacturer was trying to use a more technical term for an eye drop bottle when one was not needed as there was no difference between an eye drop bottle and an occumeter. My colleague disagreed with my comment stating that in his view

the term occumeter was a more accurate and specific term for an eye drop container.

The use of a superfluous technical term to obscure the simplicity of an already established description of an eye drop bottle illustrates three key issues associated with pharmacy knowledge. Firstly it has a number of implications in terms of using knowledge as power and trying to keep knowledge locked within a group (profession) by using the Bourdieusian concept of individuals within a field advancing what they perceive to be cultural capital. Secondly the use of a more complex term is unhelpful in the communication or advancement of knowledge. For example this term is unhelpful for both patients and practitioners as it does not support ease of communication or interaction. Finally this incident highlights how important the use of language is in making knowledge statements and reveals some insecurity about professional identity within the pharmacy profession. Describing knowledge in the world of pharmacy has helped to frame the Bourdieusian concepts of field, habitus and capital. My reflection on this incident at a formative stage of my career has confirmed that the pharmacist occupies a specific field and his/her habitus is tuned to this field. The established hospital pharmacist colleague did not perceive any problem with the use of the term 'occumeter' as this would help him to advance and confirm the position of a pharmacist in a hospital setting. At this stage I was unfamiliar with the politics of a practice setting and my habitus was student-centred. There are parallels within pharmacy education where the habitus of the laboratory scientist compared to a healthcare practitioner will influence his/her respective view of knowledge.

Theme 4: Relevance and contextualisation of curriculum content

Interpretation

This theme is underpinned by Schön's 'rigour or relevance' dilemma (Schön, 1983 p188) where the balance within pharmacy education is in favour of providing a relevant curriculum and subject content is contextualised. This approach is also more closely aligned to Scribner's use of 'skilled practical thinking' that is embedded in the larger purposive activities of daily life (Scribner, 1986). Schön's work on the relationship between technical rationality and the social context where he cites the example of a civil engineer who is more concerned with what road to build rather than how to build the road (Schön, 1983 p187) is also useful in the discussion of this theme. A lack of contextualisation can lead to a "*lack of reflective conversation with the situation*" (Schön, 1983 p268) but this conversation needs to be based on a theoretical knowledge. Both respondents R1 and R2 speak about the curriculum in terms of preparing students for practice with respondent R2 describing "*preparing a good pre-reg*" and both respondents being focused on the quality of student entering the pre-registration year following the MPharm programme.

Respondent R2 highlighted the fact that many of the pharmacy practice team maintain a practice base and continue to be experienced practitioners whilst still teaching students. The advantage of this is that they bring current examples and "*credibility*" into the classroom. This is an example of integrating practice with practice teaching, but does not illustrate the more challenging task of integrating science and practice as discussed previously in Theme 2.

The relevance of the course content becomes clearer as the course progresses. The respondents state that the heavy bias towards scientific content early on in the programme may make some students disillusioned as they feel that the

course content is not relevant. One of the issues of using relevance as a measure of whether to include specific content in a curriculum is the inevitable loss of subject areas. In the current climate where there is an increasing clinical emphasis, this loss generally involves science subjects rather than practice areas. Respondent R1 mentioned the potential problems associated with this approach and the need to look at the end product of what knowledge and skills a pharmacist needs.

R1: "There have been mutterings we have lost a lot, we have tried to explain we are not pushing it out and we are trying not to lose practicals, we want to keep them in. I am not sure how well that has gone across and everybody fully understands but we have said it quite a few times. It's much more thinking about what they need to do and what would be helpful for them, rather than you know well 40% of that is useful We would rather think which are the ones that are really necessary."

Respondent R4 mentioned that it is clear that some areas of the curriculum are naturally relevant to the future pharmacist and used pharmacy law as an example. However, this respondent stated that for some other areas of the curriculum it becomes more difficult to argue a case for their inclusion. An example used is trying to justify the teaching of research methods content in a curriculum designed for future pharmacists that will mostly not use this type of material. One way of justifying research methods content is that it will help to prepare students for their final year project or future use of audits in practice. It is clear that a discussion based on increased relevance of programme content naturally leads back to a further consideration of integration of science and practice.

R4: "In the research methods bit we have just, urm, had a module review meeting and we are going to bring in some science, so it's a more rounded module which isn't just about practice, a lot of the general things, you know, research process applies across the board it doesn't have to be a practice project. But by bringing in a scientist to help you it will integrate a little bit more."

Respondent T2 also states how important it is to ensure that curriculum content is related so that students can put the work in context. There is the view that students are less likely to be disillusioned if they can see why they are learning.

T2: "You can learn lots of facts about pharmacology or physical chemistry, urm the students can quite quickly become disillusioned I think and this is nothing to do with me working in a shop telling people what creams to buy. And because they don't understand at that point they put no effort into learning it long term. And then by the time they get to their Pre-Reg and they realise that actually its fundamental to know about lipophilicity or something to determine whether this drug gets through the skin or not, at that point they are four years down the line and they have missed the opportunity to learn it properly."

This quotation aligns more closely to the concept of 'fractal divisions' as described by Moore and Muller (2002) where there are elements of horizontality seen within vertical structure and vertical elements seen within horizontal structure. The reference to "*learning it long term*" suggests that the scientific principles are more likely to be inculcated if they are applied to everyday examples. Within institution T, contextualisation is seen as an important component of integration. It is acknowledged that this can be difficult for pharmaceutical scientists who do not have a pharmacy background. There is also reference to the lack of pharmaceutical scientists who are registered pharmacists with a background in pharmacy practice. This observation is noted in the context of observing how academics work well together to help each other to contextualise their work.

Respondent T2 has a hybrid background as he is a practising pharmacist who teaches pharmacy practice but has a scientific academic history. He is able to

give a powerful example of how he offers integrated teaching on a hospital ward.

T2: *“So when I am out doing my second year visits I make sure at that stage I am explaining what we are doing as a pharmacist in a hospital setting first of all, but also I try to give them examples from there about how their pharmacology is relating to the drug charts, and how the pharmaceuticals they are learning relates to this and how that affects the appropriateness of the dosage forms. And then beyond that physiological chemistry, why we are giving this patient a potassium infusion.”*

Schön’s development of the concept of a practicum as a *“setting designed for the task of learning a practice”* (Schön, 1987 p37) is also relevant to the discussion of this theme. There is very limited literature on the teaching of pharmacy students in a practical setting but there is the suggestion that the didactic methods of the classroom are transferred to teaching in a practice setting (Strand et al., 1987). Respondent T2 acknowledges some of the practical issues associated with the integration of practice within scientific content. For example if the placement experience is simply experiential there can be a possibility that the student experience does not match the ‘theory’. However the effective use of a teacher-practitioner can overcome this problem.

One of the key words used within School N was ‘contextualisation’ of the curriculum and this came across from all respondents. However, it became clear that this word had different meanings for different members of staff. For example the science-based respondents expressed contextualisation of content in terms of relevance and the motivation of students to learn.

N3: *“Well I definitely think things need to be put into context with the students for them to appreciate why they are learning something. I think that is very important because if you just put the information out there and don’t explain to them why it’s going to be important, how it’s going to be used in the future next year when you graduate, then they don’t really get motivated*

sometimes. And don't understand why they are doing it or it's not going to be important so they write it off."

The practice-based respondents were more focused on drawing out the relevance of the scientific components of the course. For example respondent N4 stated that students needed the building blocks of science.

N4: "I think, you know, if you teach them like, cell biology in the first year it's pretty hard going. It's basically A level biology and the staff, because it's taught by life sciences, um they teach it but um it lacks context sometimesby the time you get to the second and third year they realise that they need the building blocks of the science."

There is a clear distinction between specific contextualisation of material that can genuinely be applied to a pharmacy setting and forcing material to appear relevant. However, whilst there may be a certain amount of science that is irrelevant in terms of direct application to everyday practice, the associated transferable skills will be extremely valuable. One example used was the place of analytical chemistry, which has little direct relevance to future pharmacists but has enormous value in terms of developing numeracy and a feel for accuracy.

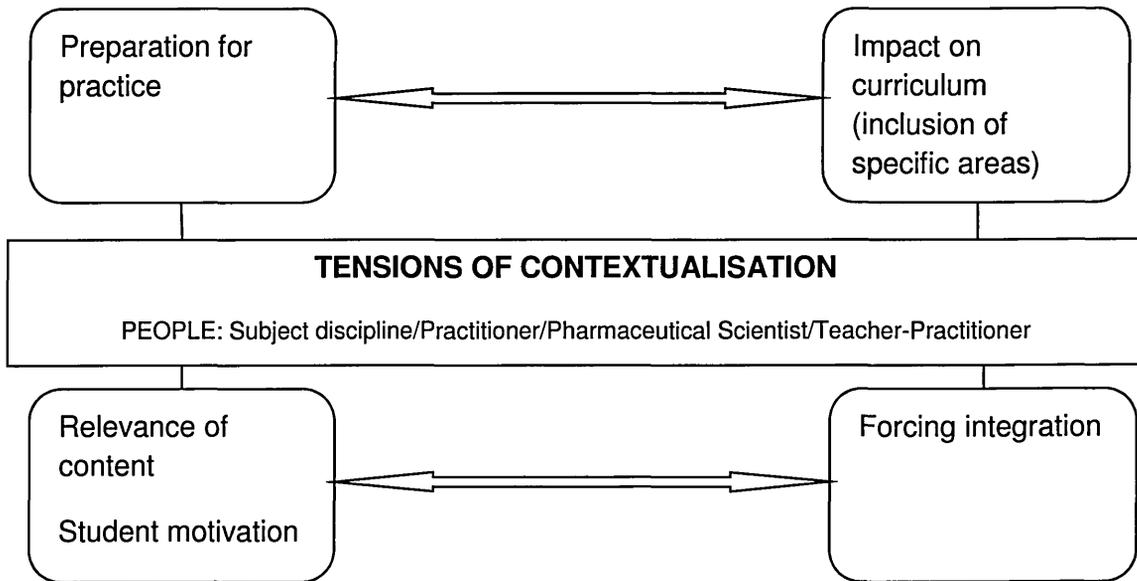
N3: "I think it's always a struggle to get them to appreciate this is important and it will help them, not only in just knowledge but also in all the other skills that they pick up while studying analytical science. But I try to emphasise those points though, the numeracy and also the way technology is."

There is an issue in the way that practitioners view the motivation of students in relation to the view of the practitioner on the link between science and practice. There needs to be a closer alignment between the practitioner and the student viewpoint for contextualisation of subject content to take place.

Contextualisation is a key term used within pharmacy education and for some it is seen as synonymous with making the undergraduate curriculum more

relevant for the future pharmacist. However, this definition is rather simplistic and various tensions have emerged from this research when considering the contextualisation theme and these are summarised in Figure 6.4.

Figure 6.4: Tensions of contextualisation



In the literature review one of the areas of discussion in relation to professional identity is the inaccessible nature of knowledge to the lay person (Bissell and Traulsen, 2005). There is a tension between knowledge that is locked in and therefore inaccessible to a wider audience which elevates professional status and the converse trend which is to make knowledge more explicit and applicable to a practice context, which lowers professional status. My interpretation from the interviews is that by making scientific knowledge more relevant to pharmacy practice there is somehow a standardisation process where knowledge is commodified and packaged into an oversimplified unit. The respondents do not refer directly to the commodification of knowledge but there is an undercurrent that suggests that professional status is threatened by

introducing more pharmacy practice into the curriculum. The scientist is keen to maintain control over their scientific knowledge domain and the practitioner is motivated to elevate practice-based knowledge by the contextualisation of curriculum content. From a Bourdieusian perspective the contextualisation of pharmacy knowledge can be viewed as a means of practitioners gaining more capital within the academic pharmacy field. The move towards a contextualisation of the curriculum also opens up questions of how this direction of travel can affect the status of a profession that is closely aligned to its scientific identity. Amongst the respondents interviewed there is a clear demonstration of Bourdieu's description of agents working in a field to increase specific cultural (knowledge) capital of the academic community of educators. However all of the respondents (agents) describe different motivating forces that determine their position. For example:

- it may be a desire to see students more prepared for future practice
- a concern over loss of scientific curriculum content
- the value of a combined Teacher-Practitioner role
- the problems associated with scientists without a pharmacy background

All of these individual views will determine how the agent may react in response to the current challenge that the traditional scientific curriculum needs to be contextualised. The use and interpretation of language is important when discussing this theme as the term contextualisation has a different set of meanings for different groups and agents across the science and practice divide. The intersubjective agreement and active dialogue moving towards a consensus as defined by Habermas (1972) is conspicuous by its absence.

There can be a pretence of communicative action through the notions of collegiality and a harmonious relationship between different disciplines.

Reflexive summary

As a pharmacy student the only clinical visit that I encountered was a short placement in a medical centre observing the consultations of a medical general practitioner. It was towards the end of the first consultation that I began to realise that the medicines being prescribed for the patient were the same as the medicines discussed in a cardiovascular pharmacology lecture the previous week. From a personal perspective there was a sudden sense of knowledge alignment with the object (medicine) and the person (elderly patient) sitting a short distance away. The theory of the medicine and its scientific mode of action until now had been separated from the practical, personal and individual issues associated with the patient. This was an important turning point in my own thinking about pharmacy and the development of my construct that for pharmacy knowledge to work the pharmacist needs to develop a more holistic view of the social object of medicine and the agency of individuals.

Brown et al. (2007) in *'Identities at work'* emphasised the importance of identity as being critical to learning in general and professional formation in particular.

The report by Guile and Ahmed(2009) on modernising pharmacy careers highlights the importance of all stakeholders supporting the process of recontextualisation of knowledge, skill and identity. Student interviews undertaken for this report describe a fragmented image of how different subjects are taught in 'silos' and an absence of cross-referencing in both teaching and assessment. Guile and Ahmed (2009 p34) suggest that the

development of pharmaceutical identity should be an explicit feature of discursive culture about learning, rather than a taken for granted feature of formation. There needs to be a different conceptualisation of the relationship between theory and practice that is based on the notion of 'recontextualisation' of knowledge and skill in different contexts (Evans et al., 2010). This presents the challenge of how to incorporate different forms of knowledge structure within the same curriculum that is meaningful and cohesive for learners (Hoskin and Anderson-Gough, 2004). An appreciation of Bernstein's descriptive language of vertical and horizontal knowledge and the relationship of different types of knowledge is critical to an understanding of this area. My experience within pharmacy education has confirmed this view that in order to be more structuring than structured as a profession there is a need to contextualise pharmaceutical science within a practice setting rather than simply study units of work labelled as 'science' or 'practice'.

Theme 5: The education and training divide

Interpretation

Bernstein's distinction between vertical and horizontal knowledge Bernstein (2000) is key to the discussion of this theme where sacred scientific knowledge is contrasted with profane case-based work. Vertical knowledge seen as institutional, individual and based on graded performance is contrasted with horizontal knowledge based on a local, communal setting and meeting competence standards. Both specialised vertical knowledge and practice horizontal knowledge are important preparation for practice and this theme aims to unpick the distinction between these types of knowledge. A useful area of the interview discussion was to determine how respondents viewed the general

move towards increased practice-based content of the MPharm programme.

Typical responses are shown for School N in Figure 6.5.

The greatest opposition to an increase in practice teaching came from the practice-based respondent N2. This respondent described her fundamental opposition to this move and expressed the view that the individual had no idea what they would need for practice until they were actually in practice. Similarly this respondent who described herself as a “*practice person*” also thought that the inclusion of social and behavioural sciences in the curriculum had gone far enough and was really in response to a requirement of the regulatory body to include this type of emphasis. Respondent N2 highlighted the value of students gaining practical experience rather than treating these issues as something that should be ‘taught’. By contrast the other practice-based respondent N4 is more in favour of an increased practice component and sees this as fundamental in improving communication skills. There is the perception that other institutions may perceive this as too much of an increase in practice-based curriculum content. The observation by Young (2008) that Bernstein views knowledge as moving away from ‘inwardness’ leading to less favourable conditions for knowledge production and professionalism can be applied to the interview narratives.

Figure 6.5: Describing the MPharm programme as education or training

EDUCATION			TRAINING
<p>N2: "I am fundamentally opposed to it really, as a practice person, yes I am, I am. Because I think until you start to learn things you can have no idea what you are going to need."</p> <p>N2: "I teach on the final term, the psychology and sociology of a pharmacist and you teach all these things, and they say it's all so obvious and it is because it's the experiences of your life and what makes people take medicine, not take medicines, what type of people could you predict. And all these things that we were never taught were we..... And you do wonder whether we are teaching something as an exercise which is really an experience."</p>	<p>N2: "When they are doing it they don't see the point, they arrive here they have done science A levels haven't they, so they want to get straight in to what they think is pharmacy. You know one lady said to us we don't do enough dispensing, it's all about science. Well yes if you want to be a dispenser there is a career path there, it's not here but you can go off and train and do a BTEC that is a career path. What are we?"</p> <p>N3: "I don't really get like that, I guess I think of it as 50/50 when I am teaching because I think it's important for them to know the content and memorise some things. But it's also good for them to know the process of what problem solving is."</p>	<p>N4: "I think universities would say we're too heavily onto practice but that's.... I wanted to do that. So I'm very happy that we've got a very good science background that we can contextualise it and our students can communicate it. So if you're brilliant at science but you can't talk to a patient, I always tell all of the students it's the case that you can come up with the most pharmaceutically brilliant product but if they won't take it it's not going to work."</p> <p>N1: "So it's important that what they know is that process of dispensing, and all its legal ramifications etc, and drug interactions that they should know off the top of their head."</p>	

The science-based respondents described how the increase in practice teaching was to be encouraged and supported. Both respondents N1 and N3 cited their involvement with practice assessments that involved role play. This involvement of all members of the teaching team in practice-based events gave the impression of a more collegial approach to practice teaching and assessment. The practice-based respondents N2 and N4 viewed the MPharm as a hybrid of education and training. Respondent N2 commented on how students viewed the scientific theoretical base of the programme and how in some cases students feel that they are not doing enough 'pharmacy' or what they perceive to be applied to future practice. Respondent N3 who teaches analytical chemistry was keen to quantify and separate the education and

training components of the MPharm, seeing this issue as an approximate 50/50 split and defined education as more about memorising information and training as centred on problem solving.

The contrast between education and training continues to reinforce the lack of professional identity within pharmacy. This is particularly poignant in the quotation from respondent N2 which ends with the rhetorical question: "*What are we?*" when recounting the issue of a student questioning why there was not more dispensing and pharmacy related activities on the programme. One of the driving influences to describe the MPharm as education rather than training is the elevation of professional status that comes with an underlying education rather than a specific training. Young (2008) draws attention to the differences in parity of esteem between education and training and how it can be difficult to inhabit the area between these two domains. This is particularly relevant to the pharmacy context as currently the profession attempts to inhabit this middle zone. Bernstein's description of horizontal and vertical knowledge (Bernstein, 2000) also assists our understanding of this contrast between vertical education which in the case of pharmacy is built on science and work-based horizontal training. Durkheim's dichotomous use of the terms sacred and profane highlighted by Young (2008) in his discussion of vocational education can be applied to the interview narratives. For example there is a distinction between the sacred scientific knowledge base used to predict beyond the present situation into a different context and the profane practice case-based approach where each situation is categorised and responded to in a more formulaic way. Within pharmacy education there is clearly a division between what Bernstein called singulars (scientific disciplines facing inwards) and regions (practice

settings facing outwards). This reveals a confused professional identity as the middle ground indicated by some respondents suggests a tension where individuals are pulled in both directions.

Reflexive summary

I can empathise with the comment from respondent N2 who recounts the incident where a student feels there is not enough dispensing on the pharmacy programme and *"it's all about science"*. I too was surprised at the high scientific content when I started as a student. I felt at the time that there was only a small area of the programme that was useful for the future pharmacist. The vocational aspects of the course were separated out from the mainly academic content. My expectation was that I had entered a training course rather than a period of education that would lead to a degree in pharmacy. Instead I found myself studying scientific subjects and attending long laboratory sessions in such subjects as botany, microbiology and analytical chemistry. It is only in retrospect and many years later working as an educator that I can see the value of a rigorous scientific education in being able to understand and communicate with others about the wider subject of pharmacy. The minimal training aspect of my degree programme as a student was obvious on the day of the final results when a few students had failed to satisfy the examiners in the practical pharmacy (dispensing) exam. The classification of their degree had been determined and was published on the notice board with all the other candidates, with the statement that the degree would be withheld until they had satisfied the examiners in the dispensing exam. This was a clear message that the undergraduate programme was about a scientific education with a token acknowledgement of the training process and preparation for future practice.

Almost 30 years later where the emphasis is increasingly on preparation for practice there is a tension with the underlying focus on scientific education. This observation relates closely to the history of pharmacy education based on scientific knowledge and the claim of pharmacy to professional status.

Theme 6: Competence and competence-based assessment

Interpretation

According to Schön (1983) professionals find it difficult to articulate the areas that lead to professional competence. This lack of articulation can be linked to Schön's observation of how the science-based practitioner appears to engage in a limited reflection in action by selecting the right problem from a 'stock' of already known problems. Schön's view of the science-based practitioner can be aligned to the current emphasis on a series of competencies that must be achieved to fulfil a professional role. Within the analysis of this theme there is a discussion of how competence can be defined and articulated and this leads to further consideration of literature that examines the concept of competence.

The literature suggests that there is no common consensus or approach to the term competence and this is evident in the wide range of definitions used by different organisations (Storey et al., 2002). There is the implication from Benner (1984) that a competent practitioner is one who views their actions in terms of long term goals and competence is only seen as a specific level and does not imply proficiency or expertise which goes beyond the competent level.

When attempting to unpick the comments of respondents I found the dichotomous definition by Eraut summarised in '*Competency in Healthcare*' (Storey et al., 2002 p7) a useful starting point. Eraut describes two types of competence as either 'socially defined competence' or 'individually situated

competence'. Socially defined competence is the ability to perform the task required to the expected standard. By contrast individually situated competence is an underlying characteristic of an individual that is causally related to criterion referenced effective performance. Here, there is a contrast between an absolute term defined by an external body and a relative term that is emerging and being constantly remodelled. It would seem reasonable to assume that the development of experience, knowledge and competence fluctuates throughout practice. Many definitions of competence focus on outputs and achievements in the workplace, rather than personal behavioural characteristics or attributes such as knowledge and understanding that underpin future performance.

Before discussing the views of different respondents it is useful to offer a brief review of the increasing emphasis on competence-based teaching and assessment within pharmacy education. The most significant recent move in this area has been the GPhC publication of *'Future pharmacists: Standards for the initial training and education of pharmacists'* (GPhC, 2011) . This document describes a series of standards against which MPharm providers are measured when submitting a pharmacy degree course for accreditation. An important section of this document is Standard 10 which provides a description of a number of outcomes which must be met in the training and education of future pharmacists. For each outcome there is a hierarchy of outcome levels (knows, knows how, shows how and does) based on Miller's triangle (Miller, 1990). Miller developed the triangle for clinical work, though it can be argued that this can also be applied to science. For example, one outcome is: *'Clinically evaluate the appropriateness of prescribed medicines'*. For this outcome there is a requirement at the MPharm level for the student to 'Shows how' and at the Preregistration level 'Does'. The MPharm provider is required to demonstrate

how they would assess each specific outcome. Typically the assessment of this type of work could take the form of an objective structured clinical exercise (OSCE) where a student would be required to demonstrate (shows how) his/her ability to evaluate and comment on the treatment sheet of a patient. An OSCE is a commonly used method to assess a variety of practical activities, usually in a role play situation. Typical examples would include negotiating with a prescriber about a prescribing error, counselling a patient on the use of a device such as an inhaler or responding to symptoms. Both behavioural and technical aspects of the student's response are assessed against specific 'ideal' criteria. The main model of competence portrayed by respondents is the use of an absolute term where competence is socially defined by the standards set by the regulatory body and against which the trainee is observed and assessed.

Table 6.4 provides a sample of comments from respondents on their view of competence and I have attempted to distinguish between Eraut's socially defined (absolute) competence which I have labelled (A), compared to individual (relative) competence which I have labelled (R). The table contrasts practice-based respondents with science-based respondents and uses the following four headings:

1. Competence as defined by a group of peers

Both the science-based respondent and the practice-based respondent referred strongly to a socially defined competence. This definition of competence is not surprising as this is the dominant culture within pharmacy education with an emphasis on GPhC standards or outcomes and how these standards can be achieved. However, as the interview conversation progresses and the

comments are unpicked there is an increasing complex response and a move down the continuum from an absolute to a relative definition of competence.

2. Competence is about the present rather than the future

Again, both N2 (practice-based) and T1 (science-based) continue to display a tendency towards an absolute term and express their concern that competence based on this model is not future-proofed. For respondent T1 the main issue with this type of approach is that it does not make students fit for future practice, as skills and practice change rapidly. This view was also echoed by respondent T3. A concern expressed is that competence-based assessment is essentially a snapshot activity where you limit what is being observed and this can have implications for future competence or lack of competence in a changing practice setting. Respondent T1 was anxious that students are able to solve a problem by working their way backwards from a practice situation by applying scientific principles they have learnt at university.

There is no articulation of the potential for using a relative model of competence at this stage or a discussion of the issues surrounding application of knowledge, skills and understanding within a continuing professional development framework.

3. Competence-based assessment: hesitation from practitioners compared to scientists.

It is not until the issue of competence-based assessment is discussed in more depth that a difference starts to emerge between the pharmacy practitioner and the scientist. Respondent N2 in particular was very clear about her hesitation

about the use of the term competence within pharmacy education. Respondent N2 quoted the lack of confidence in the Millers triangle approach of knows, shows, shows how and does and the problems associated with competence-based assessments such as OSCEs. By contrast the science-based respondents could see the value of OSCEs and see these exercises as useful in terms of contributing to the education of the student in a different way to a more traditional curriculum. The overall impression from School N was that OSCEs were well established but not used as the definitive way of assessing knowledge. Respondent N2 is clear that a socially defined (absolute) definition is inadequate when compared to the uncertain environment of everyday practice. By contrast N3 is more comfortable to speak of a socially defined model of competence that is achieved by practising and doing. The isolation of competence from subject knowledge and understanding was also a concern for practice-based respondent T2. The example of speaking to a patient and applying a competence based framework is a useful example that highlights the importance of this skill for the pharmacist.

*T2: "I think competency is not something you can take separate from the knowledge, you need to have knowledge there as well assessed in its own separate way.....But if they don't have any underlying knowledge there it might be that a question comes back from the patient and that completely stumps them at that point because they have got no library of **information** to access, to work on it."*

This respondent uses the term information in the example of responding to a patient query to illustrate his view. The retrieval of information portrays a lower level of skill than applying understanding and working back to answer a patient question using scientific principles as described by respondent T1. Respondent T2 recognised the culture of working towards competence but did not feel that the necessary support infrastructure was in place to help students improve.

4. *The contrasting view of competence*

Practice-based respondent R2 provides a succinct definition of a relative model of competence when she speaks of competence being knowledge application and using knowledge *differently* for the benefit of the patient and the profession. By contrast N1 (science-based) is confined by an absolute definition of competence and does not see subject development and individual development as part of a competence-based framework and views this as a separate issue.

One of the important areas to be raised as a result of the discussion on competence was the essential difference between the pharmacy and medical curriculum. Pharmacy was viewed as a scientific programme of study with some patient context whereas the medical programme was seen mainly as a patient orientated programme. There was also a discussion of the problems within pharmacy education caused by using paper-based exercises of the “*fictitious Mrs Jones*”:

R1: *“Whereas our students go out in the third and fourth year but they still for the majority of the time here they are talking about Mrs Jones who doesn’t exist she’s on paper. And to be honest if Mrs Jones doesn’t take her medicine in the end it doesn’t really matter because she doesn’t exist. Which is very different from actually dealing with someone sitting over the road and going to see them. That lack of patient contact I think is probably a drawback for our students, they don’t treat the patient early enough.”*

Table 6.4: Definitions of absolute (A) or relative (R) competence by practice and science-based respondents.

Practice based respondents	Science based respondents
(1) Competence as defined by a group of peers	
N2: "It's the ability to do a task to the standard set by the norm for a group of people who do it, that's our standard ..." (A)	N1: "A competence is what the General Pharmaceutical Council defines as a competence." (A)
(2) Competence is about the present rather than the future	
N2: "Well I think the danger of that is it's an absolute term, it's completely meaningless and it leaves out any sort of maturation in terms of how people have varying degrees of competence. I am very unhappy, I know you can't be half competent or anything, it is an absolute term, but urm I am a bit unhappy with it. Because once you declare someone to be competent in something at what point when something changes do they cease to be competent, and who will judge the beginning and the end of competence. I suppose, you know, you are going to monitor competence how are you going to do it, weekly, monthly, yearly, you know." (A)	T1: "You can have training to produce competence I am sure you can do that. And I am sure that when our students leave here they can begin the process of becoming into the job as it is currently. But I am not convinced that it's future proofed for future competence and I am not terribly convinced that if pressed they could answer questions where they would have to reach back on their logical ability or their ability to use logic in a scientific arena. And so in that respect I am not sure that they can be truly competent." (A)
(3) Competence-based assessment: hesitation from practitioners compared to scientists.	
N2: "As undergraduate schools we are not demonstrating our confidence. We release people who have never passed an OSCE, not our criteria, they passed everything else. But nobody is making OSCEs absolutely critical, no one at all, to progressing to the next year or passing the degree." (R)	N3: "But until you actually are faced with going through and speaking and knowing what to say, you can only get that by practising and doing. so I think it is very beneficial." (A)
N2: "I don't know why they [GPhC] have just suddenly launched on Millers triangle now.....why talk about does in terms of undergraduate education? You are not doing it until you are doing it, nobody is. Do you remember that first day of being qualified, flipping heck, there are all sorts of things coming down and you think what now. But that's does, I was in the same dispensary a week before that wasn't does. I hope that won't mean that things get lost under that mantel, you know. That you come out with these broad terms and you end up saying well I don't see why they need to know about.....whatever." (R)	
(4) The contrasting view of competence	
R2: "And if competence is a way of describing perhaps more what I do like, which is being able to apply that knowledge and use it and think a little bit differently, show that you can use that knowledge to the benefit of the patient and profession, that's what, yes competence I would say is probably the right way to go." (R)	N1: "In fact if pharmacy is a university based subject, it must not be just about gaining certain competencies that you are able to do certain things. Because robots can do certain things it doesn't mean that they can think. And It's important that people can actually take part in pharmacy as a subject and be involved to a greater or lesser extent in the development of the subject." (A)

Overall the discussion of competence revealed that the use of this term is mainly restricted to frameworks that assume that assessment is based on directly observable actions. The competency-based approach consists of functional analysis of occupational roles, translation of these roles into outcomes, and assessment of trainees' progress on the basis of their demonstrated performance of these outcomes. The medical literature provides examples of a lack of confidence in a competence-based approach that is based on a functional analysis of the end point (job) of the practitioner. For example in an evaluation of competence-based medical training Leung and Diwaker (2002) state that caution should be exercised in adopting a competency-based approach universally across all stages of medical training for which well defined and validated competencies are unavailable.

In summary, all of the respondents at School T (with the exception of T4) had a more negative view of the increasing emphasis on competence within the MPharm programme. Respondent T4 is a pharmaceutical scientist who views the MPharm programme as more vocational and links competence to important patient safety issues.

From a theoretical viewpoint competence that is defined socially and has an absolute perspective should fit in well with my view of the profession that it is more concerned with outcomes rather than processes. It could be predicted that the objective culture of pharmacy should align well with a competency framework where specific outcomes can be observed and documented.

However, the views of practice-based respondents draw out a number of disadvantages of this interpretation of competence. The main issues are the

lack of future proofing associated with this approach and the pragmatic problems linked with competence-based assessment. In her discourse on competence Wolf (1989) states that whilst competence is about the ability to perform against set standards it is the setting of these standards that is context specific. Furthermore competence must always be thought of as a construct so cannot be observed directly. Wolf's view is that the emphasis on observed consistency of outputs has resulted in the confused notion that competence is about very specific practical activities. It is the blurred interface between knowledge, understanding and competence that needs further exploration. Direct measures of competence are themselves highly contextualised and it is difficult to acquire evidence by focusing on competence alone (Wolf and Burke, 1989 p40).

It was noted that two respondents when speaking of competence made a humorous aside about "*incompetence*" being a possible outcome if a narrow vision of competence was envisaged. This highlighted how the use of language was particularly important when examining this theme. The McDonaldisation theory proposed by Ritzer (2000) can be linked to an oversimplified standards-based competence model that depends on direct observation. During the research process I became more aware of the underlying discomfort about this approach to pharmacy education. Parker (1994) comments on the importance of an individual subjectivity as opposed to a collective objectivity and how this is important in the foundation of a professional mentality and approach to an unpredictable clinical situation. I can identify fully with the viewpoint of respondent N1 who expresses concern that as pharmacy is a university subject there must be a move to develop the subject and a competence-based

framework is not necessarily the most effective vehicle to achieve this aim. In order to communicate the value of pharmacy to the wider healthcare agenda it is important that the pharmacist is able to structure rather than being structured. A competence-based framework does not appear to draw on the use of tacit knowledge as described by Polanyi (1967) as a tool to improve the understanding of the area in focus. Many competence-based exercises in my experience can be quite formulaic and students can look for certain markers or clues in the case or task before applying a pre-packaged piece of learning. This implies a fragmented approach to pharmacy knowledge rather than an acknowledgement of different types of knowledge as described by Bernstein (2000). Bernstein's description of horizontal knowledge as more aligned to competence, in contrast to the graded performance associated with vertical knowledge is also useful in the exploration of this theme. Bernstein's use of the term genericism relating to core skills (Bernstein, 2000) and the concept of trainability is especially relevant in the discussion of current pharmacy education. The concern expressed by Young (2008 p147) that a standards-based approach to knowledge collapses the distinction between the sacred and the profane and the potential impact that this may have on the learner is echoed in some of the interview narratives.

Reflexive summary

This discussion of competence reminded me of part of my community pharmacy career working for a large multiple organisation where the appraisal of members of staff was based on the question of "what looks good?" This question was addressed to a range of scenarios where the pharmacist interacts with a patient or customer and there was a standardised 'ideal' response documented by the

company demonstrating what would look good in this specific situation. The question “what looks good?” is very open as it immediately invites questions such as:

Who is defining this standard?

How is this standard agreed?

Can this standard be applied in a generic way?

Behaviour that did not fit into the defined ideal role would be seen as somehow substandard and remedial action would be taken to ensure that the person could meet the ideal standard. It is interesting to note that competence here was not defined by peers (as suggested by interview respondents) but by a hierarchical structure that defined the standard. There is a certain parallel here with pharmacy education as the standards are not defined and adapted by a localised dynamic community of practice but by a regulatory body. Some of the reservations communicated by respondents about a competence-based approach within an education setting mirror my own experience within a practice setting. To ask the question “what looks good?” suggests that there is only one answer to this question. My experience within both education and pharmacy practice is that there may be several answers to this question and a standardised format is not always appropriate. For pharmacy to be developed as a subject there needs to be a broader interpretation of competence within a fluid and changeable practice setting. This observation links to my third research question which explores the constraints, influences and tensions in the delivery of the pharmacy curriculum. It can be argued that a significant constraint is a lack of consensus about how competence is defined and a polarised view towards the measurement of observable behaviour. One of the

key obstacles to this taking place is that the MPharm programme is still viewed as primarily a scientific course with some patient context, which is in significant contrast to other healthcare professions. My interpretation is that this scientific emphasis has been translated into an oversimplified or commodified interpretation of competence within pharmacy education.

Theme 7: Comparison of institutions N, R and T

Interpretation

Visiting different types of School of Pharmacy (SOP) offered the opportunity to reflect on some of the characteristics of different types of institution. This is not a case study project where data is being gathered from a number of sources in order to make claims about the nature and features of different institutions.

However, the assignment of a label to each SOP has supported me in unpicking the comments of different respondents, when looking at other themes, according to their location and view within an institution. Figure 6.6 defines the label I have applied to each SOP and supports this label with some illustrative quotations.

Figure 6.6: Assignment of a label to three different types of School of Pharmacy

Institution N
The “blank sheet” curriculum
<p>N1: <i>“I know our degree because it was a blank sheet we were constructing it from scratch x years ago, then it already is very heavily clinically contextualised. Umm and I know that’s the way that some other schools are moving urm. I also know that some other schools are very, old fashioned is the wrong word, but traditional in their approach to what a pharmacist needs to know.”</i></p> <p>N4: <i>“Because it was a new, school, we can decide that’s what you’re going to have in it but you can do it your way, urm we’ve been able to do that. While other courses are pretty fixed, it’s been done this way for 20 years so, you know, I think we’re very lucky that we’re dynamic.”</i></p>

Institution R
The increasing importance of teaching
<p>R1: <i>“I think there is a lot of teaching, we have worked and are working quite hard towards that and towards creating professionals that employers want, we’ve engaged with them and we have asked them what they want. We have got to move so with this new programme we are producing we have got to move as a school. I think we’re probably in a point of transition. I think a lot of our teaching has vision.”</i></p> <p>R2: <i>“Research is quite high up on the agenda, but educationally led now. It’s swinging a little bit to the students and making sure the student experience is as best as it can be.”</i></p> <p>R3: <i>“We are in a research intensive university so the emphasis is still on research. The university over the years has gradually recognised that some don’t go down that route urm and there are excellent teachers and courses. So the university has recognized that and starting to do that now. And certainly within pharmacy I don’t think our primary function is research.”</i></p>

Institution T
A co-operative and formal ethos
<p>T3: <i>“I think that, it’s a formal school, it’s quite a umm, there is by and large quite clear boundaries between most staff. And it’s probably not as collegiate as it should be, if you use that expression where the degree and the future movement of pharmacy is a co-operation between staff and students. I think there is more of an expectation or more of a culture where the staff will teach the students and the students expect to be taught. Rather than necessarily this co-operation.”</i></p> <p>T3: <i>“There is possibly a bigger gap between staff and students than there used to be. I think it’s sheer numbers, that the numbers of students and the interest of the students are different.”</i></p> <p>T4: <i>“There is a discipline to the lab work definitely, we are quite [strict]. It’s important that they do things properly because I think that helps.”</i></p>

School N: The "blank sheet" curriculum

One of the overall themes to emerge from studying conversations with academic members of staff from the new School of Pharmacy is that they all emphasise that they have started with a 'blank sheet' in terms of course design. This view is expressed by all four respondents and is articulated by repeated referral and comparison to other Schools of Pharmacy where the curriculum is viewed as more fixed and determined by staff interests and ingrained methods of delivery.

My impression from conducting the interviews is that institution N has taken on a label of being new and innovative and is keen to compare their new programme in a positive light compared to the curricula of more established schools. Immediately this sets up a difference in the perceived culture of the new school. There was the overall position that other schools tend to be traditional in their approach whereas a new school with a 'blank sheet' has the opportunity to deliver a more innovative programme. This unprompted response is a key feature of the culture of institution N. The constant comparison with other institutions allows the new School of Pharmacy to have some reference point and acts as a validation for what is taking place in uncharted territory, with no previous institutional history of teaching pharmacy.

It is significant to note that institution N depicts an image of Mode 2 knowledge as described by Gibbons et al (1994) where it is important to describe knowledge in terms of a new context rather than Mode 1 knowledge generated within a historic disciplinary framework. There is a clear sense from N respondents that new is positive and helps to release the institution from the

confines of a more traditional curriculum. It should be noted that this viewpoint is not substantiated but appears to be strongly held.

From a Bourdieusian perspective institution N is occupied by a variety of academics with differing habitus. One of the problems associated with any new enterprise is the lack of track record. The accumulation of cultural capital is an urgent requirement in order to improve position within the pharmacy education field. The lack of history in delivering a pharmacy programme is turned around by institution N and instead portrayed as a positive attribute. Cultural capital is increased by making the claim that the institution is not bound by a historical scientific curriculum and offers a programme that is more relevant to future practice.

School R: The increasing importance of teaching

This established institution has a reputation for high quality and high volume research output and I expected that this research culture would be the key influence on the issues discussed within the interviews. However it was clear across all respondents that the teaching of pharmacy undergraduates is an increasing emphasis within this School of Pharmacy. The interview narratives describe an academic community in transition with a clearer emphasis on teaching than would be suggested by the external research image. There is repeated reference to the teaching focus during the interviews that demonstrate that this is an important cultural issue within this School of Pharmacy. However, there is an undercurrent in some of the language used that this is not a natural move and has somehow been forced by policy rather than individual motivation. The use of individual language has been critical in the interpretation of each

institution and the assignment of a label. For example the term 'teaching' is linked with areas such as improved student experience and the recognition of individuals as good teachers. These areas are not discussed further as they are outside the remit of the research area. From a Bourdieusian perspective the accumulation of capital within the pharmacy education field is associated with a closer alignment with teaching than traditionally associated with this institution.

School T: A cooperative and formal School of Pharmacy ethos

This well established School of Pharmacy has a long history of teaching pharmacy. This would suggest that the main emphasis of the School would be on delivery of the curriculum and issues associated with teaching. However, an overriding theme for this institution is the portrayal of a cooperative and formal ethos. There is a sense of clearly defined scientific disciplines and respondent T4 comments on the *"strict laboratory environment"*. The relationship between staff and students is seen as formal with clearly defined roles of teaching and learning. Respondent T2 explains that they would like to see university less like a school and implies that students should take more responsibility for their learning within a professional environment. In comparison to N and R, institution T appears to have more of the identity of a school rather than a fluid community of practice described by Duncan-Hewitt and Austin (2005) where both teachers and learners are engaged in the production, transfer and utilisation of knowledge. The less collegial environment lends support to the notion of knowledge increasing power and knowledge being transferred and assessed rather than used for mutual benefit between teacher and learner.

Reflexive summary

Visiting different Schools of Pharmacy to conduct the research interviews reminded me of a previous career role where I was working for a large community pharmacy multiple as a training manager. As part of my work I was required to make an annual visit to all of the Schools of Pharmacy that had a Teacher-Practitioner (TP) employed by the pharmacy company. The TP role was seen as an important position within each institution as the individual worked in both a practice and academic environment and was well placed to share different insights across these two areas of practice. The meeting involved the Head of School, the TP and myself as a representative of the company. The main agenda for the meeting was to look at ways in which the institution and the company could work more closely together using the TP as an agent. As the employer the company had a commercial interest in obtaining value for money from the TP and I felt almost an intruder entering the world of higher education as I had no inside knowledge or experience of working in higher education. The formation of personal views and labels assigned to different institutions during these meetings was based on a commercial viewpoint rather than inside knowledge of the issues faced by individual Schools of Pharmacy.

By contrast I approached the research interviews with experience of higher education and teaching pharmacy undergraduates. Whilst in theory I may have a more informed view of higher education and did not feel like an intruder I recognise at the outset that the labels assigned to each of the three institutions are blunt approximations. However, it is the use of these labels that have

supported my initial construction of pharmacy education in different locations and has been part of my reflexive approach to the research.

Theme 8: The professional identity of a pharmacist

Interpretation

The exploration of professional identity within pharmacy has drawn on two main strands of literature:

- Schön's swamp of practice and the uncertainty faced by the professional who is unable to always articulate the artistry involved in professional practice
- Bernstein's insight into knowledge relations, particularly the use of more powerful vertical knowledge which leads to increasingly abstract and therefore more inaccessible knowledge

This theme is discussed under the following subheadings:

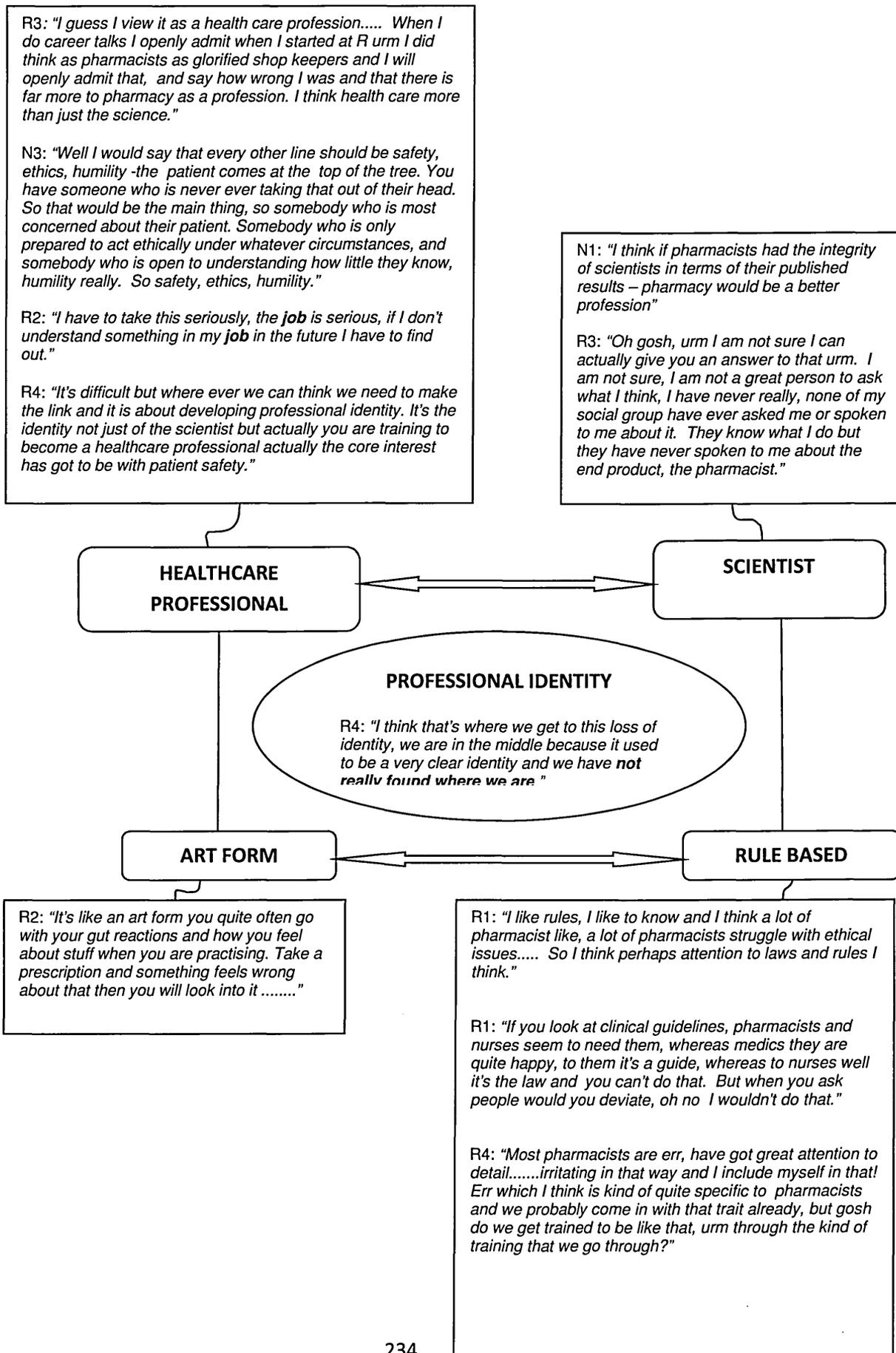
- Tension between healthcare professional and scientist
- A lack of professional satisfaction
- The invisible pharmacist
- The contrast between community and hospital practice
- Safety, ethics and integrity

Tension between healthcare professional and scientist

When describing a pharmacist, respondents would generally use the term 'healthcare professional'. The use of this term contrasts with the language of

'science' and 'practice' that is widely used and accepted within pharmacy education. Figure 6.7 represents some of the tensions that exist when attempting to define the characteristics of a pharmacist. The main tension in professional identity is between a healthcare professional and a scientist. This is a key theme as it influences the driving forces that define how future pharmacists are educated. When practice-based respondents were asked to make some generalisations about particular characteristics of pharmacists, respondents R1 and R4 highlighted the stereotype of a pharmacist overly concerned by regulations and attention to detail. Respondent R4 posed the interesting question of whether this is an inherent trait of people entering the profession or if this is something that is a result of the training and education of a pharmacist. By contrast respondent R2 had a more holistic view of the pharmacy practitioner and described practice like an "*art form*". This is a more unusual creative description of a pharmacist and echoes Schön's description of the reflective practitioner (Schön, 1983). The quotation in the centre of Figure 6.7 which encapsulates the loss of identity is referring to the historical roots of the pharmacy profession where there was more emphasis on extemporaneous dispensing and how the role of the pharmacist was much clearer in the past.

Figure 6.7: Contrasting views on the professional identity of a pharmacist



A lack of professional satisfaction

A major issue arising from conversations on professional identity is dissatisfaction with practice as it exists compared to the aspiration for what practice could be and a sense of unfulfilled potential. This echoes the study by Boardman et al. (1999) who found that about one in three pharmacists were dissatisfied with their work. There are also comments relating to pharmacy being hidden as a profession and misunderstood. Some of the ways in which pharmacy has developed are also seen more due to economic drivers than a real utilisation of a pharmacist's knowledge or skills. The comment from respondent T1 about what pharmacy offers portrays a sense of frustration about current pharmacy practice and the lack of drive and initiative within the profession. This theme is considered against the backdrop of McDonaldisation theory (Ritzer, 2000) and a rules-based approach observed within pharmacy practice.

T1: "And really offering nothing above a repackaging service. But if you could actually move into a different arena there would be so much scope. So for example we now have walk in centres, and I cannot help feeling that we really missed a trick there...."

The invisible pharmacist

Respondent T2 portrays the pharmacist as "invisible".

T2: "In hospital largely we are invisible, people don't know they have seen a pharmacist. Because we look like doctors and we walk around there and we don't speak to the patient as much as the nurses and doctors do. And when we are seen generally people don't read your name badge and they will just assume because you are not dressed as a nurse or a physio you are a doctor....."

Pharmacy was also portrayed as a very misunderstood profession by the public, where the role of the pharmacist was seen as inferior to the role of a medical

practitioner which relates to medical dominance as described by Freidson (2006).

The contrast between community and hospital practice

There is a clear contrast between hospital and community pharmacy described by respondent T2. This difference is important when considering the preparation of a future healthcare professional for their future role in community or hospital practice.

T2: *"In hospital where we are actually dealing with questions which are of the technical, clinical or scientific mix. I think it can be in contrast to community, it may be changing a bit now because you have got more services being offered by community pharmacists..... But a large proportion of us not being seen as scientists in a community setting is I think the result of the downfall of the extemporaneous dispensing."*

Safety, ethics and integrity

In terms of the wider pharmacy profession the main terms used to define pharmacy culture were: safety, ethics and integrity. The school's fitness to practise procedure that relates to student conduct is seen as very important and involves staff across all subject disciplines. A link was made by respondent N1 with honesty and integrity of the pharmacist as a professional and the work of the scientist in general. The following quotation from respondent N1 pinpoints again a perceived difference between pharmaceutical science and pharmacy practice.

N1: *"Actually one of the things, ethical contextualisation of, basically honesty and integrity are absolute within science, the whole house will come crumbling down if people falsified their data.....But actually I think to be honest there is a higher ethical and moral base within the natural sciences almost than any other area of human activity, certainly more so than in the law and medicine."*

There was a clear and unified impression from all respondents that their work within a School of Pharmacy impacts on patient safety, irrespective of their subject area. The science-based respondent N3 also highlighted the characteristics of safety, ethics and humility.

When describing the professional identity of the pharmacist there is an element of uncertainty in the interview narratives. There is the suggestion that the strong scientific educational background has been used as marker for professional status. To some extent this status is being threatened by the push towards a more practice-based content within the curriculum. With an increased practice emphasis there is a more uncertain feel to the professional status as it is not always clear what part a pharmacist plays within a practice setting. It is therefore more comfortable to point towards the security of the pharmacist's scientific background knowledge as being the solid foundation of his/her claim to professional status. This is a debate that has not been examined in detail in order to understand the profession and the educational requirements of future pharmacists. The push for increased practice-based curriculum content has resulted in an exposure of the distance between scientific content of the MPharm programme and the practicalities of applying this knowledge within a practice setting. This spotlight on a theory-practice gap has highlighted the urgent need for the Habermasian ideal of communicative action involving pharmaceutical scientists and pharmacy practitioners. Within the interview dialogue the dominant paradigm is that pharmacists are healthcare professionals but this is not aligned to the way that the MPharm course is funded or managed. This underlying tension within academic pharmacy is part of a much larger picture of a confused professional identity and public

perception of the role of a pharmacist. It is clear from all respondents irrespective of institution type, that professional issues and socialisation of the students into a professional environment are important factors in the education of a future pharmacist. The more difficult question that this research uncovers is: what exactly is the professional identity of the pharmacist being portrayed to the pharmacy student?

Reflexive summary

My reflexive summary is related to the comment by R1 about the “*fictitious Mrs Jones*” where there is a distinction between the limited value of a simulated practice exercise compared to the issues faced by students on a hospital ward or community placement. In my experience both the education and practice of pharmacy tends towards a safe paper exercise rather than the more messy social reality of interaction with patients. There is a historical component to this as the pharmacist has traditionally reacted in response to a prescription, where a decision has already been taken by a prescriber on how to treat a patient. It can be argued therefore that the professional responsibility of the pharmacist is diminished due to a reactive rather than proactive role. This traditional role is no longer accepted as the norm and pharmacists have moved into other areas of responsibility in their role as ‘medicines expert’. However, the historical impact of limited professional responsibility has resulted in restricted ways of working and narrow boundaries of responsibility for direct decisions that affect patient care. As a pre-registration student in a hospital pharmacy most of my work was fulfilling a series of tasks to ensure I was ‘competent’ in a number of areas. These activities included dispensing prescriptions, manufacturing medicines on a large scale and being able to ensure the quality of these products. All of these

activities I found quite constraining as they were tightly regulated and conformed to a strict protocol. None of these activities appeared to have a professional feel as they did not involve any decision making. It was not until later in my pre-registration training that I was asked to complete a project on how patients used inhalers for asthma and other respiratory problems that I began to see that the pharmacist could have a professional role. Having spent some time observing ward rounds and an outpatients clinic, I was given the task of assessing how inhalers were used both on the ward and in the clinic and then asked to prepare a training package to help patients who were struggling to use these devices correctly. This role 'felt' professional mainly because of the level of autonomy and uncertain responsibility I was given as a student to complete this task.

The view that knowledge associated with professional work cannot be commodified (Abbott, 1991) has directed me towards literature that emphasises the uncertainty of working within a professional context. A paper by Southon and Braithwaite (1998) is critical of many current health reforms as they are based on a simplified view of specific tasks. This simplification is inconsistent with the complexity of health service provision and does not recognise professional input within an uncertain environment. This criticism is consistent with Coles (2002) description of professionalism as being able to engage in complex and unpredictable tasks on behalf of society using individual discretion to decide what is 'best' in a particular situation rather than what is 'right' in an absolute sense. A Canadian-based study confirmed that social work students view the acknowledgement and examination of uncertainty as central to competent social work (Spafford et al., 2007). This study contrasted social work

students with medical and optometry students who revealed a 'novice rhetoric of uncertainty' where the emphasis was on seeking guidance, deflecting criticism, owning limits and showing competence. These findings can be related to the study by Rosenthal et al. (2010) which describes pharmacists as being paralysed in the face of ambiguity. Professionalism is closely related to uncertainty and involves knowledge being used and challenged in unfamiliar areas. This is an area that needs closer investigation within the pharmacy profession.

CHAPTER 7: CONCLUSION AND EVALUATION

During the writing of this concluding chapter I have been mindful of my research questions, guiding personal constructs and reflexive narrative approach to this work. The exploration of pharmacy knowledge and how this knowledge is related to professional practice has offered a number of important insights into the world of pharmacy education. This chapter starts with a discussion of my four key findings and how these relate to the research questions. The second section is an evaluation of the research project in terms of rigour, reliability, validity and a discussion of the generalisation of my findings. Thirdly there is an explanation of the contribution of this work to pharmacy education and the wider profession. This section also includes some suggested future research to follow on from this investigation. The final concluding section is incorporated into a reflexive summary entitled: 'The prescription metaphor'.

1. Key findings

The four key findings are aligned to the four research questions as stated on page 89. Each key finding is discussed with reference to the literature and specific themes discussed in the analysis of the interview narratives as summarised in Table 7.1

Table 7.1: The relationship between the key findings and the interview narrative themes

Key finding		Relationship to interview narrative themes
1	There is a wide spectrum of views on what constitutes pharmacy knowledge.	<ul style="list-style-type: none"> • A scientific identity • Describing pharmacy knowledge
2	The newer Schools of Pharmacy display a more practice-focused ethos in comparison to research or teaching-based Schools of Pharmacy.	<ul style="list-style-type: none"> • A comparison of three types of institution • Competence and competence-based assessment • Relevance and contextualisation of curriculum content
3	There is a clear polarisation between the views of pharmaceutical scientists and pharmacy practitioners which impacts on how the undergraduate curriculum is viewed and delivered.	<ul style="list-style-type: none"> • Integration of pharmaceutical science and pharmacy practice • The education and training divide
4	The lack of clarity about the professional role of the pharmacist is demonstrated within the academic community.	<ul style="list-style-type: none"> • The professional identity of a pharmacist

Key finding 1: There is a wide spectrum of views on what constitutes pharmacy knowledge.

Pharmacy knowledge and how this is communicated by members of the academic community within Schools of Pharmacy is a key area of focus for this research. The wide spectrum of views on what constitutes pharmacy knowledge is evident from the range of beliefs expressed about the role of science for pharmacists from both scientists and pharmacy practitioners. There is some concern from practitioners about the way in which current pharmacy knowledge is locked into the profession and cannot be communicated to the wider healthcare community and public. My research adds further evidence to the study by Wright et al (2006) that the MPharm degree is essentially viewed as a science-based educational programme with some practice context. This is in contrast to other healthcare professions such as medicine, dentistry and nursing where the underlying emphasis is on a practice-based curriculum. There is a tension between the traditional position of scientific knowledge within the pharmacy undergraduate curriculum and the expectation of the regulatory body for practice-based outcomes as part of its accreditation process.

Schön's topography of professional practice described as the high hard ground of technical rationality and the lowland swamp of practice (Schön, 1983) describes a tension, which in turn produces a spectrum of viewpoints between these two extremes. This picture can also be related to Polanyi's distinction between focal and tacit knowledge where tacit knowledge is used as a tool to handle what is in focus (Polanyi, 1967). One of the problems of using tacit knowledge in this way is that it is deeply embedded in the culture and practice of

the individual and is therefore difficult to transfer. Schön's work on reflection within different professional contexts leads to the question: is the context of pharmacy understood? This research provides some evidence that there is a lack of clarity about the way in which pharmacy knowledge is utilised which has resulted in an uncertain professional identity. One of the aims of the research was to ascertain what knowledge is valued within the academic community. Whilst the interview narratives reveal a strong alignment with scientific knowledge which can be linked to a more secure professional status there is also an undercurrent that pharmacy practice is essentially about problem solving. However, it is not always clear what specific contribution a pharmacist makes to problem solving within the healthcare team. This lack of relationship between technical rationality and the social context contributes to a fragmented view of pharmacy knowledge amongst the academic community. There is a drive to include 'science' within 'practice' but one of the reasons this is not embedded easily is that there is some uncertainty about describing 'practice' or the type of knowledge that this includes. The pharmacist in common with other healthcare professions has a responsibility to increase his/her knowledge by the process of continuing professional development. The current emphasis for achieving this is through participation in a cyclical process based on Kolb's cycle (Kolb, 1984) which depends on a concrete experience and subsequent observation and reflection. There is a question mark over this process if the pharmacist is unable to determine what areas of knowledge are important for his/her own practice. With the current emphasis on a reformation of the pharmacy curriculum and the integration of pharmacy knowledge it is increasingly important to ask the question: what areas of pharmacy knowledge are important for the future profession? A key finding from this research from a

pharmacy educator perspective is the lack of clarity in answering this question. All respondents have emerged from a formative scientific educational process and the interview narratives demonstrate an overall alignment with the importance of science within the pharmacy curriculum. However this can be seen across a spectrum ranging from a view of science as knowledge from the past to the imperative scientific rigour that permeates all that a pharmacist does in practice. When describing pharmacy knowledge, there is a definite contrast between practitioners and pharmaceutical scientists. Practitioners describe knowledge as being fluid and changeable and make reference to a CPD cycle, whereas scientists describe the learning of discrete areas and 'knowledge decay'. The common ground for all respondents is that pharmacy knowledge involves the translation of scientific principles into a practice setting. The meaning of 'practice' and how the emphasis on this domain is more apparent in a new School of Pharmacy is discussed in the next key finding.

Key finding 2: The newer Schools of Pharmacy display a more practice-focused ethos in comparison to research or teaching-based Schools of Pharmacy.

My research on three different types of School of Pharmacy has drawn out some of the differences between institutions. The questionnaire findings demonstrate that the newer schools, in comparison to established schools were less positive about the scientific image of pharmacy but more positive about integration of science and practice in the curriculum. Respondents from the newer schools also agreed that it was easier to work with colleagues across disciplines on curriculum development, compared to respondents from other schools. An important observation is that the newer schools portray a more

practice-based ethos. The positive approach to practice was confirmed by the interview narratives from the respondents from institution N. During the interviews there was an impression that respondents wanted to justify their stance and demonstrate the status of their own institution. This was particularly noticeable in the 'blank sheet' label I assigned to the new school and the way respondents perceived a more traditional delivery of the pharmacy curriculum in other schools. From a Bourdieusian perspective there is a significant amount of established cultural capital that is perceived to be less fluid within more established Schools of Pharmacy compared to a new School of Pharmacy. The increasing emphasis on practice within pharmacy education appears to have been interpreted differently by the more established schools R and T. The respondents in the research-based institution were keen to portray a positive interest in the quality of teaching and student experience. The teaching-based institution appeared to have a more formal ethos and emphasis on professional standards of conduct in contrast to other Schools of Pharmacy.

The dilemma of 'rigour or relevance' framed by Schön (1983 p188) appears to be more biased in favour of relevance in the new Schools of Pharmacy where there is a move away from technical rationality. The continuing professional development process underpinned by Kolb's learning cycle (Kolb, 1984) used widely in practice and also within the undergraduate curriculum elevates everyday knowledge and the impact of this knowledge on practice. The increase in practice-based teaching is also more closely aligned to the term competence. Overall, the interview narratives portray an emphasis on absolute competence at a required standard as defined by Eraut (1994). One of the problems associated with this approach is that competence is set in the present

rather than the evolving practice of future competence. Of particular interest is the hesitation about competence that comes mainly from practitioners rather than scientists. There are contrasting views from different respondents but in general the practice-based respondents are more closely associated with Eraut's relative definition of competence (Eraut, 1994) which is more individualised and fluid. This viewpoint is in direct comparison to scientists who overall present a more absolute definition of competence. One interpretation of this is that an absolute definition is more closely aligned to the emphasis on objective knowledge traditionally associated with the laboratory scientist. Practitioners are more closely involved in competence-based assessment and are aware of some of the challenging issues associated with this approach. Alternatively this diversity of opinion is a product of the way that pharmaceutical scientists as opposed to healthcare practitioners view the world. Some scientists portrayed a naive positivist culture when speaking about this type of activity compared to pharmacy practitioners.

The theme of relevance and contextualisation of the curriculum also addresses Schön's description of a lack of reflective conversation with the situation (Schön, 1983 p268). However, this reflective conversation appears to conflict with the scientific pedigree of the profession and the associated professional status that this brings. A Bourdieusian perspective would state that a more practice-centred approach to the curriculum is ultimately transferring capital from the scientist to the practitioner. Some of the more negative issues associated with an increased practice emphasis is that the MPharm curriculum becomes too focused on preparation for preregistration training and there is forced integration and commodification of knowledge. A more positive

perspective on this approach is that contextualisation is important as it places learning more within the profession and supports the thinking behind more innovative approaches such as the creation of a Community of Practice (Duncan-Hewitt and Austin, 2005). Guile and Ahmed (2009) suggest that the development of a pharmaceutical identity is important and should be more explicit within the teaching and learning community, rather than a taken for granted feature. This observation is challenging and encourages pharmacy educators to have a clearer vision of the end product of a pharmacist and what this implies for the curriculum. Overall my research findings concur that the contextualisation of pharmaceutical science within the teaching of practice is important. However this ideal requires practitioners to have the ability to refer confidently to science which is not used in their everyday practice and for scientists to be able to communicate meaningfully with practitioners. Bernstein's vertical and horizontal description of knowledge structures and relations (Bernstein, 2000) is key to our understanding of this challenge. This social realist approach also supports our understanding of the direction of integration as discussed in the next key finding.

Key finding 3: There is a clear polarisation between the views of pharmaceutical scientists and pharmacy practitioners which impacts on how the undergraduate curriculum is viewed and delivered.

This study confirms the polarisation in the views of pharmaceutical scientists and pharmacy practitioners who constitute the academic community of a School of Pharmacy. Whilst this difference would be expected I have been surprised by the extent of the diversity of viewpoint between 'scientist' and 'practitioner'

revealed by this research. Schön's description of the stark choice between high ground rigour and swampy practice (Schön, 1983 p42) is particularly relevant in the academic pharmacy community. The dichotomous language used in the literature such as: convergent and divergent (Becher, 1989) , focal and tacit (Polanyi, 1967), Mode 1 and Mode 2 (Gibbons, 1994), are useful tools in the exploration of undergraduate pharmacy knowledge. Whilst recognising that these are artificial opposites, the extreme ends of the theory-practice spectrum have offered reference points in the exploration of this area.

The differences in cultural capital in terms of knowledge, experience and connections are very different for the scientist and practitioner. A Bourdieusian perspective supports an understanding of the differences observed within a School of Pharmacy. The School of Pharmacy is a fluid structure where the battle lines are drawn between the conservation of a scientific education and the transformation of the profession through a pragmatic skills-based curriculum. The academic community can be viewed as a community in tension, where the internal principles of sociability of a specific scientific field conflict with the requirements of the profession for an increasing standards-driven curriculum. The fit between individual habitus and the field of operation becomes more difficult as the differences between scientists and practitioners are made more obvious in the move towards an integrated curriculum.

There is a clear divergence in how the integration of science and practice within the curriculum is viewed where the driver for integration is an attempt to contextualise theoretical content. This aim of integration is seen as important by both groups but there is some hesitation from practitioners who see this as

sometimes being forced and not always a helpful solution. The theoretical insights from Bernstein's description of vertical and horizontal knowledge (Bernstein, 2000) support our understanding of the science-practice polarisation as individuals and groups draw on different forms of knowledge. Respondents have described a forcing of integration and how the integration of individuals can be a limiting factor in the integration of knowledge. The research also reveals a useful insight into the direction of integration where the integration of practice into science is seen as more achievable than the opposite movement of science into practice. This can be interpreted by reference to Bernstein's description of horizontal segmented knowledge being transferred into a vertical structure whereas abstract pyramidal theoretical structures do not fit as readily into a horizontal practice-based structure (Bernstein, 2000). This implies that there is a responsibility for the academic practitioner to move practice knowledge into the pharmaceutical science domain. However this theoretically more favourable direction of integration is dependent on the practitioner having a current understanding of science which becomes more difficult as the practitioner has moved further away from his/her formative scientific roots.

Division between scientific and practice-based thinking was also seen in the way that the curriculum is described as education or training. Again, there is a separation between scientists and pharmacy practitioners, where scientists in general are more in favour of the MPharm being described as an educational rather than a training process. A view that both scientists and pharmacy practitioners share is that it is the translation of scientific principles into practice that is more important than learning detailed scientific content. This view

appears to contradict the more favourable direction of integration of practice into science as discussed above.

The emphasis of the professional regulator on the demonstration of a series of professional standards (GPhC, 2011) suggest that the current emphasis is on training rather than education for future pharmacists. This aligns with Young's observation that Bernstein views knowledge as moving away from 'inwardness' leading to less favourable conditions for knowledge production and professionalism (Young, 2008). The polarisation of science and practice that has contributed to a split between knowledge and skill has resulted in a confusing middle ground and a blurred professional identity. The drive for integration of knowledge is seen as a solution to the problem of a separation of education and training and the lack of parity of esteem between these two areas. The theoretical insights from Schön's rigour or relevance dilemma, Bernstein's description of knowledge relations and Bourdieu's field theory are vital for our ongoing understanding of this area.

Key finding 4: The lack of clarity about the professional role of the pharmacist is demonstrated within the academic community.

The lack of clarity about the professional role of the pharmacist in a practice setting is demonstrated in the views of respondents. There is a wide range of descriptions used for the pharmacist such as 'invisible' and 'rules-based' that describe a mismatch between how the pharmacy profession is viewed compared to the educational requirements and aspirations of the profession.

There is a lack of consensus within the literature on the basic traits of a professional but one of the key traits cited by Bissell and Traulsen (2005 p192) is: *“theoretical knowledge underlying the practice of the professional”*. However, insights from my research suggest that it is difficult for science to underpin pharmacy practice due to the way that scientific knowledge is structured compared to practice knowledge in this field. This difficulty is compounded by the blurred professional identity of pharmacy and a lack of clarity about the role of the pharmacist within the healthcare team. Professional identity can be examined more closely by looking at the characteristics of knowledge within the pharmacy profession. The theoretical framework and findings from this research suggests that in order to increase our understanding of pharmacy professional identity there is a need to develop the following:

- Innovative ways of moving from the comfort zone of technical rationality towards reflection in action
- Increased awareness of how different agents operate within the pharmacy education field and their specific contribution to pharmacy knowledge
- An application of the social realist perspective where both knowledge and the social basis of knowledge are acknowledged

This research indicates that pharmacy educators recognize the importance of knowledge and in particular scientific knowledge but there is limited description of how this knowledge has arisen or how it is used within the profession. The interview narratives portray an overall tension between the pharmacist as a scientist and a healthcare professional. This can be described as a conflict

between 'rule-based' approaches as opposed to an acceptance of uncertainty that is more typical of clinical practice. The tendency towards a scientific identity does not correlate with the everyday practice of community pharmacy which is the largest sector of the pharmacy profession. This lack of clarity about professional identity within the academic community will continue to hinder the design and delivery of the MPharm curriculum.

It is useful to relate this lack of professional identity to other professions closely associated with pharmacy. The publication of the GPhC standards for the initial education and training of pharmacists (GPhC, 2011) has been compared unfavourably with *'Tomorrow's doctors: education outcomes and standards for undergraduate medical education'* issued by the General Medical Council (GMC, 2009). It is argued by Anderson (2011) that *'Tomorrow's doctors'* had a positive impact on the education of medical practitioners whereas *'Future pharmacists'* lacks detail and appears to be a missed opportunity to shape the future of the profession. *'Tomorrow's doctors'* expands on three key themes of medical education under the headings: the doctor as scientist and scholar, as practitioner and as a professional. There is a clear link with professional role and identity of the future medical practitioner which is not obvious in the GPhC documentation for future pharmacists. This lack of explicit discussion about the role and purpose of the pharmacy profession impacts on our understanding of professional education within this context and is an important outcome from this research.

In the evaluation of the interview narratives I have discussed how professionalism is closely associated with uncertainty and complexity (Coles,

2002). The study by Spafford et al (2007) compares the way in which social work students embrace uncertainty compared to medical and optometry students who reveal a 'novice rhetoric of uncertainty'. The uncertain professional identity of pharmacists revealed by my research is related to a conflict that is rooted in an appeal to traditional scientific identity, amidst the current move towards a more practice-based culture. Within healthcare professions in general there is concern about the movement of healthcare work from one professional group to another. For example the movement of routine work of doctors to nurses, driven by market forces, results in changing roles and identities and creates a culture of uncertainty (Williams and Sibbald, 1999). The historical move of the work of a pharmacist from dispensing to the provision of a range of services more closely associated with the medical or nursing profession has also resulted in a confused professional identity. The findings of my research imply that the pragmatic move to change the emphasis of the MPharm curriculum to a more integrated, practice-based curriculum has further compounded this lack of professional identity.

2. Evaluation

Rigour: reliability and validity

I consider my research findings to have a consistency and trustworthiness in the sense that the methods used for both the questionnaire and interview study have followed a rigorous and reproducible pattern of recording and analysis. There is the strong possibility that the course of the interview conversation would have been different with a different researcher. However, the questionnaire format is fixed for all respondents and it is from this instrument that the guiding themes emerged. Reliability is important in any research but

there is a danger that an overriding emphasis on reliability can impede the creative and reflexive research process that was required for this type of investigation. Consistent methods of analysis have been used for both questionnaire and interview data but my reflexive insights are personal and it could be claimed that these are not reliable as they are biased by my own culture, past experience and viewpoint. To partially address this problem the reflexive summary that corresponds to different sections of my findings was not written until I was clear about the emerging findings from my sample group.

Validity is vital to any research project and I consider that the research questions have arisen from my personal experience within the field and this is demonstrated in the strength of my findings. When discussing the social construction of validity, Kvale (1995) states that truly valid research, in the postmodern era, would be research that makes questions of validity superfluous because of its craftsmanship and strong results. The results from this research are summarised and grounded in the person of the researcher. My validity is based on coherence where I have been concerned to look at the internal logic of statements made by respondents and link them with my own experience in a hermeneutic approach. This is in contrast to a positivist matching or correspondence to the view of an objective world, which would be inappropriate for this type of study.

Generalisation

It is important to ask the question if the results from my study can be transferred and applied to pharmacy education in general in the UK. One of the strengths of this study is that the interview phase was preceded by a questionnaire study

that examined a large sample of Schools of Pharmacy in the UK. The findings from the questionnaire study can be generalised to some extent, on the basis that the sample is broadly representative of pharmacy educators. However, making any knowledge claims on the basis of the questionnaire alone was not the aim of this research. The questionnaire as part of a larger mixed methods study was seen as a way of leading into the interview phase and developing a constructivist approach to gain an insight into themes arising from the questionnaire. The value of this work has been the exploration of personal tacit knowledge of pharmacy educators, how this is verbalised and in turn how I have used a personal reflexive tool to summarise and communicate my understanding of the area of focus. In his book '*After Method: Mess in social science research*' Law (2004) argues that methods do not necessarily describe social realities but help to create them, which suggests that methods of research are essentially political. I can identify strongly with this argument as I look back retrospectively at my research where I see myself as a central figure framed by the formulation of my own research questions. This has been of enormous personal and future professional value as it has encouraged me to consider my own practice as an educator and how this impacts on future practitioners.

This research is seen as a starting point in the exploration of this important area. Future work that could be developed from this exploration is to design a study that examines specific subject areas of the MPharm curriculum and how these relate to and impact on professional practice. It would be useful to follow up this work with some detailed comparative case-based work on different Schools of Pharmacy. The use of focus groups as a research instrument would

be beneficial to observe the direct interaction between scientists and practitioners in the pharmacy education field.

3. Contributions to the field

According to a recent discussion paper from the NHS modernising careers programme, undergraduate education for pharmacists has not changed significantly for over 40 years (MEE, 2011). The potential of the undergraduate curriculum is not utilised as fully as it could be by the practising pharmacist and this has resulted in professional frustration and poor professional image. This research raises awareness of three important issues within the world of pharmacy education. Firstly it draws attention to the widely used labels of 'science' and 'practice' and how these common terms are an oversimplification and potentially misleading way of presenting a more complex academic community. The use of these terms should be challenged and the practice of scientists and the science used by practitioners should be stated within a more open dialogue. Secondly this work has exposed some of the ways in which academics from different disciplines view the increasing emphasis on a competence-based approach to the preparation of students for their future professional role. The drive for a competence-based model and the positivist mindset of a profession that has scientific roots can be linked. The move towards practical outcomes needs further consideration in a profession that appears to contribute to healthcare mainly through knowledge rather than direct action. Finally a more integrated approach to the delivery and assessment of pharmacy knowledge is seen as the main solution to the gap between 'science' and 'practice'. It is questionable when applying Bourdieusian constructs whether deeper integration can take place whilst educators continue to occupy separate

spaces and apply different approaches. The application of Bernstein's description of vertical and horizontal knowledge can also contribute to our understanding of the integration of science and practice. Overall there needs to be a clearer articulation of what integration means and how this is affected by the social interaction of the academic pharmacy community.

Recently within pharmacy literature there is an increasing discussion of the value of pharmaceutical science in clinical practice (Airley, 2012) and contextualisation of science within the MPharm curriculum (Fergus and Kostrzewski, 2011). There is the argument from Florence (2011) that a loss of physical and chemical sciences will impact not only on future practice but on the future form of pharmacy education. The profession of pharmacy should celebrate and strengthen its unique scientific knowledge base and aim to create new knowledge (Harding and Taylor, 2011). Brown (2011) states that the pharmacist in the community or hospital setting must have a scientific foundation to his or her work, if they are to be believed or respected. My research shows that an appeal to science strengthens the claim for professional status but there is also some uncertainty about the scientific identity of the pharmacist particularly in the new Schools of Pharmacy.

Whilst there is a substantial body of literature on teaching and learning there is much less on the philosophical perspectives that can stimulate meaningful dialogue about pharmacy education (Robinson, 2002). Anderson Harper et al. (1996 p314) state that *"rarely is ideology clearly and explicitly exposed in the pharmacy curriculum development and planning process"* and suggest that those developing curricular plans may not even be consciously aware of the

world view orientations that they hold. My study has made a contribution to addressing this imbalance by opening a discussion about the nature of pharmacy knowledge and how this can be identified and utilised in practice.

4. Reflexive summary: The prescription metaphor

Within the pharmacy profession there is the shift away from the pharmacist being involved with all stages of the supply process and being confined by the prescription and the constraints that this object imposes. The prescription is an essential objective vehicle by which medicines are delivered to the population but it is only one way of providing medicine. Other approaches to patient care that centre on the health and social needs of the patient and an interdisciplinary framework may provide an increased and more flexible access to the social object of medicine. Similarly for the pharmacy education researcher there is a prescriptive objective element that must remain in view. This objective element is the 'ideal pharmacist' end product required by society and confirmed by the regulatory authority. However, if I only remain in this restricted prescriptive domain then there is a shallowness of research experience that ignores the many layered hidden reality. Instead my research process has involved a blend of creativity and robust procedures to tackle the ontological question: what is pharmacy knowledge and how is this related to practice? My personal view is that I need to look creatively beyond the strait-jacket of what is traditionally perceived as scientific objectivity in order to make a meaningful contribution to the future of the profession. This has involved me in a personal reflexive journey that required an open self-assessment of my own subjective values and personal position within the field.

(Word count: 62,853)

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APPENDIX

1. Ethical approval of research project
2. Cover letter for questionnaire
3. Participant information for interview
4. Questionnaire
5. Semi-structured interview schedule
6. Questionnaire rationale document
7. Summary of numerical data from questionnaire
8. Provisional interview summary document
9. Sample interview transcript for respondent N2



SHARPENS YOUR THINKING

Our Ref AM/SW/25-2010.

Jon Waterfield

Dear Jon

Request for Ethical Approval of Research Project

Your research project entitled "**What is the relationship between undergraduate pharmacy education and professional practice?**" has been submitted for ethical review to the Faculty's rapporteurs and I am pleased to confirm that they have approved your project.

I wish you every success with your research project.

Yours sincerely

A handwritten signature in black ink, appearing to read 'A Macaskill', written in a cursive style.

Professor A Macaskill
Chair
Faculty Research Ethics Committee

Office address :

Research Support Team
Faculty of Development & Society
Sheffield Hallam University
Unit 9, Sheffield Science Park
Howard Street
Sheffield
S1 2LX
Tel: 0114-2256236
Fax: 0114-2253673
E-mail: s.wharam@shu.ac.uk



SHARPENS YOUR THINKING

Date: 5th November, 2010

Dear (insert name)

I am an academic member of staff at the Leicester School of Pharmacy and currently undertaking some research as part of my Doctorate in Education studies at Sheffield Hallam University. The study is essentially an exploration of pharmacy knowledge and its relationship with professional identity.

This will focus on certain key areas:

- the distinction between pharmaceutical science and professional practice areas of the MPharm curriculum and how this issue is viewed
- the differences that exist in professional opinion on the preparation of the future practitioner for professional practice
- the ongoing education vs. training debate within a vocational pharmacy education programme

I would be grateful if you are able to spend **10 minutes** completing the enclosed questionnaire and returning in the prepaid reply envelope by 22nd November. The project has been ethically approved by both Sheffield Hallam University and De Montfort University. Each questionnaire has been coded so that I can send out a reminder letter in due course to improve the response rate. The code will not be used for any other purpose. **All replies will be treated in the strictest confidence and any participants or institutions will be totally anonymous and will not be identified in any future publications.**

If you would like to find out more about the background to my studies I have provided a link to an article that I have recently published in *AJPE*: 'Is pharmacy a knowledge based profession?' <http://www.ajpe.org/aj7403/aj740350/aj740350.pdf>

If you have any queries related to this project please do not hesitate to contact either myself or my Director of Studies, Mike Coldwell m.r.coldwell@shu.ac.uk

I would like to take this opportunity to thank you in advance for returning the questionnaire and sharing your views.

Yours sincerely,

Jon Waterfield MRPharmS

Principal Lecturer in Pharmacy Practice
Leicester School of Pharmacy,
Room H2M6A,
Hawthorn Building,
The Gateway,
Leicester. LE1 9BH

JWaterfield@dmu.ac.uk

APPENDIX 3: Participant information for interview (follow-up letter for respondents who expressed an interest in interview).



SHARPENS YOUR THINKING

Date : (insert)

Dear (insert name)

I would like to invite you to participate in some educational research that explores pharmacy knowledge and professional identity. This is part of a pharmacy education project for my EdD based at Sheffield Hallam University.

The study consists of a one hour tape-recorded, individual interview that follows on from your questionnaire. The semi-structured interview aims to explore your views on pharmacy education with particular reference to your views on what areas of pharmacy knowledge are important for the practising pharmacist. Participation in this research is voluntary and participants have the right to withhold information and withdraw from the study at any time.

Any information that you give will be anonymised in any subsequent report or presentation of this work. All information given will be treated in the strictest confidence. A full report of this work will be available on request.

The interview has been arranged for (insert date and time) at (insert venue). I would be grateful if you could complete the attached consent form and bring this to the interview.

Further information on this part of the project is provided in the information sheet attached. If you have any queries related to this project please do not hesitate to contact either myself or my Director of Studies, Mike Coldwell m.r.coldwell@shu.ac.uk

I would like to thank you in anticipation of your support in the exploration of this important area.

Yours sincerely,

Jon Waterfield

JWaterfield@dmu.ac.uk

ANSWERS TO SOME COMMON QUESTIONS

1. What is the title of the project?

An exploration of pharmacy knowledge and professional identity

2. What is the project about?

The study is essentially an exploration of pharmacy knowledge and its relationship with professional identity. The overall aim is to explore the views of pharmacy educators on the nature and position of pharmacy practice within the Master of Pharmacy (MPharm) undergraduate curriculum. This will focus on certain key areas:

- *the distinction between pharmaceutical science and professional practice areas of the curriculum and how this issue is viewed*
- *the differences that exist in professional opinion on the preparation of the future practitioner for professional practice*
- *the ongoing education vs. training debate within a vocational pharmacy education programme*

3. Why have you asked me to take part?

Following on from the questionnaire respondents were asked to indicate their willingness to participate in the interview phase of this research project. You have been selected from a pool of respondents who indicated that they are willing to participate in an interview.

4. What will I be required to do?

This part of the research consists of an interview that will last approximately one hour. The interview is informal and you will be invited to expand on some of your views about pharmacy education as indicated in your questionnaire.

5. Where will this take place?

The interview will take place at a mutually convenient venue.

6. How often will I have to take part, and for how long?

This is a single one hour interview.

7. Who will be responsible for all of the information when this study is over?

The investigator and the supervisory team at Sheffield Hallam University will have responsibility for the data.

8. Who will have access to it?

All data in connection with this project is stored on a password protected computer and any hard copy material is stored in a locked cabinet. The data can only be accessed by the investigator and the supervisory team.

9. What will happen to the information when this study is over?

On completion of the EdD all raw data will be stored by the researcher on either a password protected computer or locked cabinet and will only be referred to in the event of a future query relating to this work.

10. How will you use what you find out?

The data will only be used for the purpose of writing the EdD thesis and any associated publications.

11. Will anyone be able to connect me with what is recorded and reported?

All data is anonymised by the use of a coding system where participant names and names of institutions are not used. It will not be possible to identify individuals from any presentation of the work connected with this project.

12. How long is the whole study likely to last?

The study is likely to last approximately 2 years.

13. How can I find out about the results of the study?

After completion of the EdD thesis, summary information about the results will be available from the investigator on request.

14. What if I do not wish to take part?

Participation in this research project is totally voluntary and you are under no obligation to take part.

15. What if I change my mind during the study?

Any participants are free to withdraw from the study at any stage and do not need to give a reason for their withdrawal.

16. Who do I contact with any concerns about this study?

If you have any concerns about this study please contact the Director of Studies for this research project:

Mike Coldwell, Director of Centre for Education and Inclusion Research at Sheffield Hallam University. Email m.r.coldwell@shu.ac.uk

PARTICIPANT CONSENT

I am willing to participate in a piece of educational research on pharmacy education which I understand involves participation in an individual one hour interview that is tape-recorded.

Please initial next to the statements below to indicate your consent to participate in this research.

- I consent to participation in the interview. _____

- I consent to the interview being tape-recorded. _____

- I understand that my participation is voluntary and I have the right to withhold information or withdraw from the study at any stage. _____

Signed _____ Date _____

Name _____ (PLEASE PRINT)

APPENDIX 4: Questionnaire

*This questionnaire is the initial part of a study that aims to explore the views of pharmacy educators on the nature of pharmacy knowledge in relation to professional identity. The questionnaire should take **no longer than 10 minutes to complete**. Please return the questionnaire in the reply envelope provided.*

I would like to take this opportunity to thank you in advance for returning the questionnaire and sharing your views. If you have any queries related to this project please do not hesitate to contact either myself or my Director of Studies, Mike Coldwell. m.r.coldwell@shu.ac.uk

Jon Waterfield MRPharmS
JWaterfield@dmu.ac.uk
 Leicester School of Pharmacy

Please indicate your *immediate response* and level of agreement with the following 15 statements, by ticking (✓) the box which most closely represents your views.

Statement	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
1. The pharmacist should be thought of as primarily a pharmaceutical scientist.					
2. Students should have a broad foundation in pharmaceutical science before any pharmacy practice teaching is introduced.					
3. The MPharm degree should be viewed more as a broad education rather than training for a future role in community, hospital or industrial practice.					
4. A problem based approach to delivering the MPharm curriculum is more beneficial for learning than an emphasis on syllabus content.					
5. Pharmaceutical science is more important than application of clinical practice based knowledge during the MPharm programme.					

Statement	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
6. MPharm students are generally able to make the link between scientific components of the programme and their future practice.					
7. Pharmaceutical scientists and pharmacy practitioners work together to contextualise the pharmaceutical science content of the MPharm curriculum.					
8. A lot of effort is made in the delivery of the MPharm programme to link pharmacology to a pharmacy practice context.					
9. Social and behavioural sciences do not need to be included in the MPharm programme.					
10. The MPharm curriculum should only include areas that are directly relevant to community, hospital and industrial practice.					
11. It is difficult to creatively develop the teaching of my subject area on the MPharm programme.					
12. Members of the MPharm teaching team are generally keen to develop cross curriculum links between subject areas					
13. The MPharm programme should focus more on competence based outputs that are linked to professional practice rather than pharmaceutical science.					

Statement	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
14. A lot of effort is made in the MPharm programme to link pharmaceutical chemistry/pharmaceutics to a pharmacy practice context.					
15. Specialised application of scientific knowledge should be the main attribute of the pharmacist.					

What in your view is the MPharm degree for?

What in essence is the main role of the pharmacist?

Any further comments on your answers. Please feel free to expand or qualify any of your responses in the above section. (Continue overleaf if necessary.)

Please answer the following questions about your profile by ticking (✓) the appropriate box

1. Gender

Male		Female	
------	--	--------	--

2. Age

20-29		30-39		40-49		50-59		Over 60	
-------	--	-------	--	-------	--	-------	--	---------	--

3. Pharmacist status

Registered pharmacist		(Please go to Question 4)
Qualified as a pharmacist but not currently registered		(Please go straight to Question 5)
Not a pharmacist		(Please go straight to Question 5)

4. Previous experience as a pharmacist. I would describe my main career background as a pharmacist before working in academia mainly in:

(Tick a maximum of 2 boxes to reflect your main career)

Hospital Pharmacy	
Community Pharmacy	
Industry	
PCT role	
Management role associated with pharmacy	
Academia	
Other (describe below)	

5. Current Role

Tick the 1 box that most closely relates to your current role

Lecturer/Senior Lecturer/Principal Lecturer	
Research Fellow/Senior Research Fellow/Principal Research Fellow	
Teaching Fellow	
Teacher Practitioner	
Reader	

Professor	
Other (describe)	

6. Main subject area

Tick one box

Pharmaceutical chemistry	
Pharmaceutics	
Pharmacology	
Pharmacy Practice/Clinical Pharmacy	

7. Work profile

Tick one box

Mainly teaching with some research	
Mainly research with some teaching	
Mainly management with some teaching/research	
Teaching with no research	
Research with no teaching	
Other (describe below)	

Thank you for taking the time to complete this questionnaire, your contribution is much appreciated. Please return the form in the envelope provided.

Interview

In March/April 2011 I am hoping to obtain a more detailed insight into some of the issues that have arisen from this questionnaire by conducting a number of semi-structured interviews. The interviews will last approximately one hour and take place at a location and time convenient for you.

If you would like to volunteer to be interviewed and contribute further to this research project, please complete the box below. You will be contacted early in 2011.

Yes I am willing to participate in a 1 hour interview

Name _____

Email address (insert) _____

Please leave blank if you do not wish to participate in an interview.

SEMI-STRUCTURED INTERVIEW

Name _____ Venue _____ Date _____ Time _____

Questions will be drawn from six different domains. As the conversation progresses these will be ticked off a matrix as the topic is covered either by the interviewee or prompted by the interviewer.

Overall research question for the interview:

What types of ideas, norms and beliefs about the pharmacist contribute to the development of the MPharm programme?

Issues from questionnaire to follow up:

INDIVIDUAL

- Prof history – journey to SOP?
- Do you feel what you teach (subject area) is of value to the pharmacy profession – what aspects of your work with students do you feel are most important?
- How do you feel about teaching on the MPharm programme?

PHARMACY AS KNOWLEDGE BASED PROFESSION

- How important is knowledge for the pharmacist?
- To what extent is/or should the future pharmacist be prepared for their future role by the MPharm programme?
- Within a climate of increasing ‘competence’ – what do you understand by this term?
- To what extent do you agree with a more competence based approach to teaching/assessment?

INTEGRATION OF CURRICULUM

- How do areas that you teach fit in with other areas of the curriculum? – examples/problems/practical issues

SCIENTIFIC IDENTITY OF PHARMACIST

- What do you understand by the term ‘science’ as applied to pharmacy? (issues to probe ‘science underpinning practice’ ‘science versus practice’ ‘science integrated with practice’)
- How important is a scientific education for a future pharmacist in community/hospital?
- Pharmacists are often described as “experts on medicines” – to what extent do you agree with this description? (other descriptions of a pharmacist?)

INCREASING THE PRACTICE COMPONENT OF THE CURRICULUM

- How do you feel about the increase in the practice component of the curriculum? – problems/positive features/practicalities?
- What has been lost/gained by increasing the practice component of the curriculum – view on current/ potential impact on future of profession?

THE VIEW OF THE PHARMACIST (either direct = pharmacist interviewee or indirect=non pharmacist interviewee)

- What types of values/norms/beliefs distinguish pharmacists from other professions – stereotype/true in your experience?
- What type of thinking/approach would be 'ideal' for a pharmacist? – why?
- How well do pharmacists and non pharmacists work together in an academic context – issues of integration of subject areas/working together/different values?
- How important is the MPharm in instilling values of patient safety/concern for the individual
- How would you describe the 'culture' of your own School of Pharmacy? – pharmacy bias/scientific research/integrated – patient orientated – how has this culture arisen?

APPENDIX 6: Questionnaire rationale document

Research Question	Issue to identify	Pro-(theme)	Agreement = FOR	Agreement = AGAINST	Statement on questionnaire (for agreement using Likert scale)
1. What areas of pharmacy knowledge are viewed as important by pharmacy educators within different higher education institutions?	What is the attitude towards the pharmacy profession being fundamentally scientific?	science	x		The pharmacist should be thought of as primarily a pharmaceutical scientist.
	Are pharmaceutical subject areas seen as distinct and separate disciplines?	integration		x	Students should have a broad foundation in pharmaceutical science before any pharmacy practice teaching is introduced.
	Is there more concern with application of	application	x		A problem based approach to the MPharm curriculum is more beneficial for learning than an

						emphasis on syllabus content.
					x	Pharmaceutical science is more important than application of clinical practice based knowledge during the MPharm programme.
					x	Specialised application of scientific knowledge should be the main attribute of the pharmacist.
					x	The MPharm curriculum should only include areas that are directly relevant to community, hospital and industrial practice.
					x	MPharm students are generally able to make the link between scientific components of the programme and their future practice.
					x	Social and behavioural sciences do not need to be included in the MPharm programme.
					x	Members of the MPharm teaching team are generally keen to develop cross curriculum links between subject areas.
knowledge rather than acquisition of knowledge?						
Is it important that the content of the MPharm is relevant to future practice?						relevance of knowledge
Are social and behavioural sciences seen as important?						Social and behavioural sciences
Is there any perceived conflict between science based and practice based areas of the						Science/practice conflict
2. What indicators of support are there for an increased practice based curriculum from a sample of both science based and practice based educators?						

	curriculum?				
	Is the move towards a more competence based practice based curriculum a positive step in achieving competence/preparation for practice?	training	x		The MPharm programme should focus more on competence based outputs that are linked to professional practice rather than pharmaceutical science.
	Is it necessary for pharmaceutical science to be contextualised (in a practice setting by a pharmacist) for the learner?	contextualisation of knowledge	x	x	A lot of effort is made in the MPharm programme to link pharmaceutical chemistry/pharmaceutics to a pharmacy practice context.
			x		A lot of effort is made in the delivery of the MPharm programme to link pharmacology to a pharmacy practice context. Pharmaceutical scientists and pharmacy practitioners work together to contextualise the pharmaceutical science content of

3. What constraints, influences or tensions are evident in the delivery of the pharmacy practice curriculum?	Is there enough freedom to creatively develop the MPharm?	Is the broad process of learning as important as the formalised learning outcome process?	ease of curriculum innovation		x	the MPharm curriculum. It is difficult to creatively develop the teaching of my subject area on the MPharm programme.
						The MPharm degree should be viewed more as a broad education rather than training for a future role in community, hospital or industrial practice.

APPENDIX 7: Summary of numerical data from questionnaire

Percentage of overall respondents matched against Likert scale statements

	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total	Theme
1	The pharmacist should be thought of as primarily a pharmaceutical scientist.	6.6	41.1	22.3	23.4	6.6	100	SCI
2	Students should have a broad foundation in pharmaceutical science before any pharmacy practice teaching is introduced.	15.7	31.5	8.6	31.5	12.7	100	INT
3	The MPharm degree should be viewed more as a broad education rather than training for a future role in community, hospital or industrial practice.	9.6	26.9	12.8	35.5	15.2	100	EDU
4	A problem based approach to delivering the MPharm curriculum is more beneficial for learning than an emphasis on syllabus content.	3	22.3	32.5	32	10.2	100	KNOWL

	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total	Theme
5	Pharmaceutical science is more important than application of clinical practice based knowledge during the MPharm programme.	11.7	45.2	26.3	11.7	5.1	100	SCI
6	MPharm students are generally able to make the link between scientific components of the programme and their future practice.	9.1	46.2	14.8	27.4	2.5	100	INT
7	Pharmaceutical scientists and pharmacy practitioners work together to contextualise the pharmaceutical science content of the MPharm curriculum.	2.5	15.2	20.9	48.2	13.2	100	INT
8	A lot of effort is made in the delivery of the MPharm programme to link pharmacology to a pharmacy practice context.	1	5.1	20.8	52.8	20.3	100	INT
9	Social and behavioural sciences do not need to be included in the MPharm programme.	29.4	46.7	9.2	8.1	6.6	100	SBS/PRAC

	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total	Theme
10	The MPharm curriculum should only include areas that are directly relevant to community, hospital and industrial practice	27.4	52.8	8.6	10.2	1	100	PRAC
11	It is difficult to creatively develop the teaching of my subject area on the MPharm programme.	21.3	44.7	19.3	12.2	2.5	100	DEV
12	Members of the MPharm teaching team are generally keen to develop cross curriculum links between subject areas	1.5	8.6	21.4	55.8	12.7	100	DEV
13	The MPharm programme should focus more on competence based outputs that are linked to professional practice rather than pharmaceutical science.	12.2	39.1	23.3	21.8	3.6	100	PRAC
14	A lot of effort is made in the MPharm programme to link pharmaceutical chemistry/pharmaceutics to a pharmacy practice context.	2	12.2	25.4	49.7	10.7	100	INT
15	Specialised application of scientific knowledge should be the main attribute of the pharmacist.	1	12.2	22.3	47.2	17.3	100	KNOWL

Mean Likert scores cross-matched with themes for different types of respondent as described in Chapter 4

Key

Type of SOP	N	New	Note:
	T	Teaching emphasis	Final column the mean Likert score for each theme has been calculated for comparison
	R	Research emphasis	
			N=total number of respondents for each type who have responded to statements linked to theme
Pharmacist	P	Registered pharmacist	
	NP	Non-pharmacist	
Subject area	PS	Physical scientist	
	BS	Biological scientist	
	P/C	Practitioner/Clinical	
Role	T	Mainly teaching	
	R	Mainly research	
	M	Mainly management	

Theme		N	T	R	Total	P	NP	Total
Scientific identity	Mean	4.9	5.5	5.5		5	5.8	
	N	59	67	70	196	122	74	196
Integration of Science/Practice	Mean	18	16	16		17	16.1	
	N	60	66	66	192	119	73	192
Practice based curriculum	Mean	8.7	8.5	8.4		8.9	7.9	
	N	60	67	70	197	123	74	197
MPHarm as wider education	Mean	3.3	3.2	3.1		3.1	3.3	
	N	60	67	70	197	123	74	197
Ease of MPHarm development	Mean	7.7	7.2	7.3		7.7	6.9	
	N	60	67	69	196	122	74	196
Knowledge application	Mean	7.1	7	6.7		6.9	6.9	
	N	60	66	69	195	122	73	195

Theme	PS	BS	P/C	T	R	M	Total
Scientific identity	Mean	6.2	5.6	4.6	5.2	6.15	5.3
	N	69	30	97	120	39	195
Integration of Science/Practice	Mean	15.7	17.2	17.2	16.4	15.3	16.7
	N	67	30	95	117	39	191
Practice based curriculum	Mean	7.3	8.1	9.5	8.7	7.5	8.5
	N	69	30	98	120	39	196
MPharm as wider education	Mean	3.5	3.1	3	3.2	3.3	3.2
	N	69	30	98	120	39	196
Ease of MPharm development	Mean	7	7.2	7.7	7.4	7	7.4
	N	68	30	98	120	38	195
Knowledge application	Mean	6.9	7	6.9	6.9	6.5	6.9
	N	68	30	97	119	39	194

APPENDIX 8: Provisional interview summary document

Provisional interview data summary (initial notes following the interview and looking at the checked interview transcript in relation to interview themes and other themes emerging)

Type of School of Pharmacy: A new School of Pharmacy (N) (i.e. MPharm programme only recently introduced to the University)

Interviewee/profile	Pharmacy as a knowledge based profession (cf. issue of competence)	Integration of science and practice	Scientific identity of pharmacist	Increasing the practice component of curriculum	The view/thinking of the pharmacist	Other emerging themes or areas of interest from the individual
N1 Pharmaceutical Scientist Male 50-59	The issue of 'knowledge decay' More retention of pharmacology needed for clinical involvement	Contextualisation The individual developing links between disparate knowledge	The issue of two different cultures in a School of Pharmacy i.e. practice and science. – useful conflict Homoeopathy?!	Importance of looking ahead and not just training for pharmacy now (but throughout working life) – the ability to manage and integrate change Related to healthcare costs (less expensive than employing GP)	Need integrity link to natural sciences Need rational thinking	Non-pharmacist The values/ethics of natural science The different approaches in thinking between scientists and practice staff Rational and ethical thinking of the pharmacist. The undercurrent of money (earnings) of the future pharmacist and impact on student motivation Driver for a more clinical course politically driven by NHS costs? Use of interesting example of antibiotic biochemistry and future prescribing, individualised diagnostic technology and role of pharmacist. Culture= subservience of research and any research very prescriptive, lack of creativity

<p>N2 Pharmacy practice Female 40-49</p>	<p>All areas of curriculum equally valuable – including science Competence as something that is time limited</p>	<p>Science and practice should not be distinct Easier to integrate with a new school (limited history) Interesting example receptors/brain biochemistry/lactation – patient acceptability</p>	<p>Pro science – scientific education very important</p>	<p>Underlying science important – what is 'practice' currently quite narrow definition</p>	<p>Patient should be at top of thinking</p>	<p>Pharmacist OSCEs (competence) and relationship between more traditional methods – poor correlation – ability to 'think on feet' Not sure fit for purpose The strong personalities associated with academia Pharmacy students acting superior to other students Doubts about the move towards a competence based approach Safety, ethics, humility (patient first) – link with changes in society Non-pharmacist</p>
<p>N3 Pharmaceutical Scientist Female 30-39</p>	<p>Process of learning and processing data, numeracy and accuracy skills (through medium of analytical chem.) Need fundamental science</p>	<p>Future technology and diagnostic technology – understanding importance for future pharmacist involvement in clinic</p>	<p>Progressive understanding of students that the science is important (but not initially) Numeracy/accuracy issue</p>	<p>Positive but have limited understanding of role of pharmacist.</p>	<p>Honesty, integrity FTP issues Pharmacy practice appears rather colourful as opposed to scientific black/white</p>	<p>Numeracy/accuracy – contrast of hard science with social arena of pharmacy practice</p>
<p>N4 Pharmacy Practice Male 40-49</p>	<p>Science important particularly biological aspects but must be able to communicate Pharmaceutical science not main identity</p>	<p>Integration works quite well where there are integrated teams delivering curriculum</p>	<p>Does not see pharmaceutical scientist as main identity – more social/communication skills as important</p>	<p>Most pharmacists are patient facing and this must be the direction of travel</p>	<p>Ability to reflect Protecting the public Ability to talk to people</p>	<p>Pharmacist – maintains practice base through locum work Knowing what to do with facts (a lot of information widely available) Strong emphasis on communication skills Skills more important than knowledge Need range of assessment methods as OSCEs do not fully address issues</p>

Provisional interview data summary (initial notes following the interview and looking at the checked interview transcript in relation to interview themes and other themes emerging)

Type of School of Pharmacy: A teaching based institution with established School of Pharmacy (T)

Interviewee/profile	Pharmacy as a knowledge based profession (cf. issue of competence)	Integration of science and practice	Scientific identity of pharmacist	Increasing the practice component of curriculum	The view/thinking of the pharmacist	Other emerging themes or areas of interest from the individual
T1 Pharmaceutical Scientist Female 60-69	Need tools to be able to develop career Need firm grounding in evidence and science (Currently production of possible incompetence)	Contextualisation important	Vitally important	This has gone too far as practice changes so much – key foundation science is vital	Honesty/integrity – link with scientific attitude	Scientist but registered pharmacist that still engages with locum work Future proofing the degree course by looking ahead Mention of homeopathy as an example of non science Uncertain of value of social and behavioural sciences as part of curriculum
T2 Pharmacy Practice Male 30-39	Knowledge crucial Culture of people not knowing much Competency assessments not useful in the absence of a knowledge base.	Possible especially in study of disease states – but a lot of work for students that are not prepared for this approach	Hospital –yes Community – not scientific image	Difficult – finite contact time Both practice and science important – need to push students more to engage with both areas Eventually there will be a tipping point where we have knocked so	Pedantic (irritating) – this is not a negative attribute Patient concern	Pharmacist with current regular practice base (works p/t in HE) but background in science Knowledge and competency cannot be separated in terms of preparation for the job Students need to know why they need to know science (not apparent early in programme) Issue of homeopathy on a pharmacy programme Importance of market force issues in relation to

							<p>patient care</p> <p>A more integrated approach and a harder working ethos needed by students</p>
<p>T3 Pharmaceutical Scientist Male 50-59</p>	<p>Need a basic knowledge but can't know everything – need to know where to look</p> <p>Problem of overwhelming students</p>	<p>More links needed but based on principles rather than study of more conditions</p>	<p>Important – but need to think carefully about what we mean by science and look to the future</p>	<p>Probably gone far enough – more about providing tools to look at evidence than emphasis on content</p>	<p>Cautious and careful</p> <p>Ability to think on their feet</p>	<p>Pharmacist</p> <p>School quite formal – not collegiate enough</p> <p>Students need more confidence and understanding</p>	
<p>T4 Pharmaceutical Scientist Female 30-39</p>	<p>Need basic knowledge even to be able to look things up and be able to understand</p> <p>Competency related to safety</p>	<p>Science to underpin practice</p>	<p>Importance of underpinning scientific knowledge to be able to answer more challenging questions</p> <p>The value of the discipline associated with 'science'</p>	<p>Pragmatic issue for scientists is loss of work</p> <p>Some concern over loss of science – in relation to future understanding for pharmacists</p>	<p>Caring</p> <p>Following strict guidelines</p> <p>Being very ethical</p> <p>Public do not see in best light</p>	<p>Non-pharmacist</p> <p>Pharmacy students acting superior to other students – to point of arrogance</p> <p>Good teaching ethos and this is valued</p>	

Provisional interview data summary (initial notes following the interview and looking at the checked interview transcript in relation to interview themes and other themes emerging)

Type of School of Pharmacy: A research based institution with established School of Pharmacy (R)

Interviewee/profile	Pharmacy as a knowledge based profession (cf. issue of competence)	Integration of science and practice	Scientific identity of pharmacist	Increasing the practice component of curriculum	The view/thinking of the pharmacist	Other emerging themes or areas of interest from the individual
R1 Pharmacy Practice Male 40-49	Heavy focus on knowledge – access to knowledge is difficult (open book exams more demanding) Use of word competence is used differently – optom quite specific cf pharmacy more general	Team of scientists and pharmacists on modules	Important to be able to explain the science within a healthcare team Need good scientific basis	Aim to increase practice component but without taking the science out?	Attention to laws and rules	Pharmacist Students need more patient involvement to understand their future role. Transition period for School – an increasing focus on teaching Increased contact hours not necessarily positive for educational outcome
R2 Pharmacy Practice Female 30-39	Practical issues of communication more important – realisation of importance of knowledge difficult to appreciate as a student.	Yes important but physics (physical pharmacy topics) difficult Quite separate 2 plus 2 model science then practice but this is changing	Think like a scientist but practice is a balancing act	Overall positive but nothing can prepare for practice like actually practising..	Scientist that has to link so much together (public face) Pessimistic and cautious, analytical thinking that has developed	Pharmacist that has regular practice base Confidence in knowing the science behind the medicine The MPharm is about sending out a good prereg with the fundamentals Importance of good role models Learning (more powerful) once qualified Hard working culture within pharmacy academia Pride in the quality of the degree

<p>R3 Pharmaceutical Scientist Male 50-59</p>	<p>Scientific knowledge can underpin future work and practice</p>	<p>Some areas easier than others to integrate and it should not be forced</p>	<p>More healthcare profession than just science</p>	<p>Agree with increase in practice, though some components probably in too much detail</p>	<p>Unsure about this area</p>	<p>Non-pharmacist School quite patient focussed Supportive environment but overall research is most important driver Scientific background helps to understand a range of practice issues</p>
<p>R4 Pharmacy Practice Female 40-49</p>	<p>Knowledge on its own useless Application important but have to have the building blocks Unsure about the interpretation of competence by professional body</p>	<p>Integration very important and to make the links explicit from early on in programme</p>	<p>Scientific background very important in order to be able to offer something unique to healthcare</p>	<p>Importance of practice element coming into programme and increasing – but needs drawing together with science</p>	<p>Great attention to detail (irritating) Difficult to answer due to loss of identity (loss of traditional role) not really found our way since then</p>	<p>Pharmacist The issue of a blurred and uncertain professional identity Trained too much and leads to professional frustration Importance of a solid scientific background Research driven institution but pressure for quality of teaching</p>

General observations

School of Pharmacy	<p>The N institution has some similarities between scientists and practitioners e.g. emphasis on honesty and integrity, FTP issues and the diagnostic testing example. Both types of interviewee doubt the value of OSCEs are pro science and patient focused. There are also significant differences:</p> <p>N1 clearly recognises 2 different cultures and ways of thinking, keen on a rational approach, is cost conscious and gives homoeopathy as an example of where cultures clash</p> <p>N2 more pro science – even though a practice based teacher</p> <p>N3 not as clear as N1 about the value of science but warms up to the theme of analytical chemistry having many transferable skills useful for the pharmacist</p> <p>N4 much more emphasis on communication skills</p> <p>(This SOP very keen to compare with other SOPs and see their offering as more relevant?)</p>
T	<p>T1 and T2 both have the benefit of experience in current pharmacy practice, though are pharmaceutical scientists – interesting hybrid that needs unpicking in discussion.</p> <p>Impression of a formal school atmosphere with good teaching but impression is that students are lacking in understanding and compartmentalise knowledge</p>
R	<p>Keen to emphasise that teaching is important and this a fairly recent culture change for this SOP</p> <p>The issue of forced integration – especially in the area of physical sciences</p> <p>It is the science that is the unique nature of the pharmacy profession (within healthcare arena)</p> <p>The idea that too much practice ‘training’ leads to professional frustration – when the reality does not match the expectation.</p>

Interview N2

[xx..... Information that may identify respondent has been removed]

[? Lack of clarity on audio recording]

How did you get into teaching in the School of Pharmacy?

Urm I am a xx pharmacist by training and I have always taught here at the University, I used to teach xx here at the University. So I have been coming to the University since 19... I think it's about x years. And when my eldest child went off to university I thought well I might as well do something different and I did. I was just working part time and then my younger one has gone now.

So was it the teaching side that attracted you?

Urm yes I do love teaching, as you know as you move on through your career you do less and less.

Yes get into more management, yes. But teaching was the initial ..

Yes I like teaching, I like it a lot.

Looking back at your questionnaire, one of the questions is about whether you see it more as an education or more as a training ?? It's probably a false distinction but you sometimes say is it training, you come down more on the side of you disagreed. The MPharm programme should be viewed more as a broad education than as training for future role. I just wondered if you could elaborate on that a bit more?

Yes I mean, it's a really fine line isn't it, we know, I don't know when you graduated I was xx and, you know, we could never have been taught what we needed to know now. In fact at X where I went we never saw a prescription or anything, pharmacy has changed considerably. So my own view is it is somewhere between education and training but we have to train people to be flexible learners. Because there is nothing we can do to prepare them for their career other than the ability to, they need to know the core bits of pharmacology and all of that, but we do have to educate them. But we have to train them to go out and learn for themselves and to understand the need to go out and learn for themselves. It's unrecognisable as a career this isn't it. And that is what the young people find so difficult to understand, in my opinion. You can never know everything and we always say to them the more you learn the more it uncovers what you don't know, and, you know, you get to the fourth year here and you have got this perception that you have been educated and you know everything you are ever going to need. But we know don't we that that's not the case, so it is a very muddy area isn't it.

What parts of the curriculum or parts of your work do you think are most valuable to students?

Well I am probably very unfashionable but I think it's all equally valuable and that includes the science. Because I think there is a danger that we are going to be just diluted versions of other health professions. If we only think that part of the education is important, if we lose this distinction, the science, what actually are we bringing to the table. If we are part of a multi disciplinary group, what are you bringing to the table, well a bit less than the medics and maybe a bit different to the nurses. But I think what makes us different is that we are scientists as well as health care professionals and that is quite distinct. So I actually think all of it is important.

Do you see a division between science and practice, I know here the word contextualisation is used a lot isn't it, and there was an article recently about chemistry in this School. What does that word mean to you - contextualisation?

contextualisation, I am part of that project, urm should they be distinct, we separate them out I think but that's largely to do with the teaching themes. You know it's the chemists who mainly teach the chemistry and the pharmacists mainly teach practice, but then there is a cross over. I teach mental health but the chemists teach on that because that's part of it, and hopefully in September we are hoping that the pharmacy practice will teach part of synthetic chemistry, because there is this overlap. Urm, are they distinct, I don't think they should be, I really don't think they should be. I mean I was talking to one of my colleagues and do you remember we would always be titrating and pipeting and all of that, but actually we have never done that, we have not done that for ever. But actually that rigour, that absolute rigour was something that you know permeates through everything that a pharmacist does. This need to be thorough and exact and how the odd milligram or the odd mL does make a very significant difference. I don't think you could spare any of it really, the students I am sure don't think the same, they think it's all a dreadful waste of time don't they. But it does inform everything and certainly having, have you practiced?

Yes ??

Do you, are you a hospital pharmacist?

Community.

Certainly in hospital you know knowing a great deal about formulation in terms of getting medicines into mentally ill people that's a unique offering I would say. We have got to sacrifice the solubility in order to, who else on a team could offer that other than a pharmacist.

So how do you feel about teaching on the MPharm in general, there is quite a big move now towards a competence-based approach....I wondered how you felt about that?

I don't think you can get to the standards unless everything else is in place. I only teach the fourth years, I don't see the first and second years very much at all, and third years I think I do 2 or 3 hours. I am only really doing that at the end point, one foot out the door really. Urm and I think the attitude to learning is really important, you know, this professionalism. You know they love all the pharmacy practice don't they, I am sure it's the same, everybody, all the students seem to think, when we interview them they love chemistry and that's why they want to do pharmacy. When they arrive in October that's all, oh I have changed my mind I am not that interested in chemistry. You know, it's a really interesting point, it's a really fascinating, I am really interested in it actually.

if you were to define competence how would you ..

It's the ability to do a task to the standard set by the norm for a group of people who do it, that's our standard ...

Do you see it as anything different to that?

Well I think the danger of that is it's an absolute term, it's completely meaningless and urr and it leaves out any sort of maturation in terms of how people have varying degrees of competence. I am very unhappy, I know you can't be half competent or anything, it is an absolute term, but urm I am a bit unhappy with it. Because once you declare someone to be competent in something at what point when something changes do they cease to be competent, and who will judge the beginning and the end of competence. I suppose, you know, you are going to monitor competence how are you going to do it, weekly, monthly, yearly, you know. They are looking at NCAS aren't they, looking at reviewing pharmacy competence, how often, weekly, ?? today not last week, really.....

So in terms of this whole idea of more practice in the curriculum, how comfortable do you feel with that?

I am fundamentally opposed to it really, as a practice person, yes I am, I am. Because I think until you start to learn things you can have no idea what you are going to need. And sometimes the students will say well I've not passed chemistry but I want to be a community pharmacist I am not going to need it. But actually the way pharmacy is evolving there is no predicting what we are going to need. If you talk to them about aminophylline and theophylline salt, what do you mean by salts, well unless you have done the chemistry you can talk the talk but actually in terms of meaning what does it mean. You know why should something with an extra sodium be able to pass through the blood brain barrier. Its very abstract and meaningless unless you have got that rigorous level. And I think A levels have deteriorated so much that we can't make any

assumptions about what they are going to know coming in. So if we don't teach them they could be a chemist but actually not know very much about chemistry at all. You sound like you don't agree with me.

I am pro science as well I must admit, I think it's a very interesting area but it's quite a difficult area to unpick. How do you think relationships are for example between members of staff who are science-based and practice based?

We are a very happy department, I think a lot of schools of pharmacy are a happy department, we are a very happy department. There is all this banter, you know, you are not a scientist you are a pharmacist, but it is banter. Because on the whole I think, I mean obviously they are experts and they know a good deal more than we do about chemistry, you know, they really do. But I am a BSc are you a BSc or are you a BPharm?

A BPharm, I did an MSc in pharmacology.

At X we got a BSc, I consider myself to be a scientist, I do. And there is a little bit of joshing but there is nothing sinister, there is no side looking down on any others.

Do you think they fundamentally think differently, a practitioner opposed to a scientist?

I hope not, I really hope not. I hope we don't give anything off that suggests to anyone that the science isn't important, I would be very disappointed myself.

You wonder sometimes if there is a different thinking there. Some people have said there is a false division between a scientist and a practitioner .

Yes, and our course is modular so everything is divided into modules so we don't help ourselves. We are saying we are an integrated course but because we deliver modules we then separate it out. And that creates a false division and that is just to do with teaching teams, you know, this module will be run by people from pharmacology, this will be run by ... and I think that's very dangerous. There is a lot of work, you are seeing X aren't you, X shares with X who wrote this article, so there is a lot of moving over and people. I think we are a young new school and people do really speak with each other, the layout encourages people to. I really, there is banter about science, there is always banter.

Science is a bit of a loaded term.

Truly I consider myself, I mean I would probably be more comfortable teaching chemistry than I would anything to do with dispensing, because I have not dispensed anything since 19xx so I would probably be safer teaching chemistry, you know.

This whole issue of scientific education I am picking up the view that you think scientific education is very important.

Yes I think it's critical, you know, medicines are developing enormously, I think beyond what we could possibly have expected. And I think in order for us to be more than people, we don't want to be treated as people who put labels on boxes, so that means we have to have a core understanding of what is in that box. Not just that the dose is what it says on the ? it's not going to kill the patient and its appropriate for the patient. We have got to understand why that product may be better, why it might be more harmful, what can be happening to make the patient safer. And unless you have got that fundamental understanding of what's in the tablet, why it's not suitable to do various other things that tablet, why it's not suitable to do various other things, I don't think you are in a position to give advice.

A standard answer when you ask what a pharmacists is they will say an expert on medicines, do you agree with that?

What does it mean?

What would you say a pharmacist is?

Well

What I am trying to get at with my research is I am trying to look at the end product of a pharmacist and the knowledge and mesh the two together.

An expert on medicines.

is that true?

It's a bit sort of, what does it mean, I don't understand what it means, in what context are we an expert? And you can't be an expert in medicines because that suggests that we all of us know a really diverse range of things, which we don't, nobody does. Then we are back to I don't know everything but I am in a position that I know how to find out about them. But I would hate to think we would get to a point where somebody who was working in practice couldn't do more than open up the BNF or the Martindale whatever they use, read what's there but not actually have an understanding of why its different to something else. And without the science I don't think you would ever be in that position would you.

The background?

Yes I don't think you'd, unless you are thinking about transmitters, you know in my field its moved enormously. And I didn't have an idea of brain chemistry, brain anatomy, about transmitters, I don't think I could make meaning. And if I couldn't make meaning then how can I say any different from opening the BNF at random and saying well I think you need to have this. It's only because I sort

of thing well here I have got a young man I can see he is not going to want to lactate for example so I am going to pick something for him, for his schizophrenia, that will be less likely to cause that. So how are you going to do that if you don't understand human physiology and then the chemistry of why things may or may not bind to receptors. It's taking it down to a very banal level isn't it, the sort of thing anyone could Google really.

Do you think the students pick up on this importance?

When they are doing it in the first and second year they really don't. I think by the fourth year when it gets a bit more developed and you start challenging them, well how do you know that, why do you know that, I think they do. I teach an optional module in the fourth year and we go down to ?and we have patients and we look at all the ways of choosing the appropriate medicines. And you get down to this well why is this going to bind with this, and I think suddenly there is a moment where you think goodness, yes that was a bit of ?? EBM in the first year. Because otherwise it's just words isn't it, it's not meaningful.

So you see it more of a progressive understanding?

When they are doing it they don't see the point, they arrive here they have done science A levels haven't they, so they want to get straight in to what they think is pharmacy. You know one lady said to us we don't do enough dispensing, it's all about science. Well yes if you want to be a dispenser there is a career path there, it's not here but you can go off and train and do a BTEC, that is a career path. What are we?

Yes that's the interesting question I think. Students don't understand what they are signing up for do they.

And maybe they are waiting until they are qualified and the responsibility is theirs. I think this is the problem that they can't imagine what it's like to carry that responsibility until the day they are qualified. And suddenly actually it becomes really important that you understand why the patient could be harmed or what have you. Sorry I am not giving you concrete answers to anything.

It's fine. So in terms of what a pharmacist is, what type of norms and values do you think a pharmacist has compared to other professions?

Other medical professions?

Yes

I don't think you can be so specific.

Is there anything as educators we should be preparing them for in terms of how their values are ...

I think um certainly from our day this idea that they are subject to the GPhC fitness to practice, I think that's a very good idea. Because for us certainly we were expected to see that at some point at the end of our Pre Reg year. And I think it's quite difficult to take, I have got two children at university and I do wonder whether they would be able to see this change of status almost in terms of responsibility and it's a very responsible profession, we are a very responsible profession. And it's getting, I am not answering your question am I?

Well you are because this whole issue of responsibility is a whole theme in itself.

You are responsible for your own practicing competency aren't you, and patient safety. So you have got to gather enough information to be able to make decisions on behalf of other people, whilst being expected to be able to make that decision.

Do you think the MPharm prepares students for that?

We do here.

How do you ?

We've got, it's just hammered home all the time, um we introduce them to fitness to practice right at the beginning. They are given ethical dilemmas all the time, they are constantly signing things that um you know draws their attention. If they do anything wrong they have a hot line here and then we have a discussion about it and they pick out where they have transgressed. So we are constantly, because it's a big transition isn't it, from 18 year old young person to 23 year old pharmacist. And we do expect them to run with it straight away don't we. And I think it's not just, you know, it's not just being a decent human being, it's not those standards that maybe being a lawyer you know, it's more than that isn't it.

Its people's health at the end of the day.

Yes and the consequences of something, you making a wrong decision.

It's a hard question to ask anybody. Do you feel like as a team here you work together at that?

Yes and you would distinguish between the scientists and the pharmacists.

Do you think there is a distinction?

No not in terms of that, you don't have to be a pharmacist in this department to understand the relevance of fitness to practise I hear it as much from my non pharmacist colleagues, xx..... And I hear about professionalism and the code

of conduct, I hear it as much from the non pharmacy staff which is very good, very encouraging.

Are there any divisions between the science based and ...

?? only in student choice, they do the module in the fourth year and to a man we have to really work hard for them to choose something. Is it not the same at X?

They have to do a science elective and a practice and we ask them to do one of each.

you are talking about the pharmacology and its the second year, its forever not just for the second year its forever, pharmacology is forever.

How important do you think the MPharm is in terms of instilling values of patient safety? One of the things that came out in the questionnaire study was ... it's about safety, do you go along with that?

I think we look at it as a separate issue, we do do, we are really good on patient safety and a whole module in their final term is about patient safety and all of that. And it does come up a lot, it's a recurring theme, but it's not really integrated.

It's a module in its own right is it?

Yes. There are four modules in the final term, this one patient safety and then another one which is another practice module which is a double, so they get another whack of it in there. And there is another module, one is double and the other two are singles, and in the fourth one they get 3 full days as well. So in the final term they are getting an enormous wodge of patient safety and they do it in law as well in the third year as well. It could be a recurring theme, you know, in dispensing it's there and you know maybe we need to be signposting it a bit more, but it is a recurring theme. And again I think that's different from ?? University really.

Do you think enough is done to integrate things on the programme?

Urm, we do our very best and I think we do pretty well urm. Some things will inevitably fall off the edge. I was reviewing the fourth year, I teach on every module, urm I realised we did the yellow card for example on all 3 of the modules in the final year. And part of me thinks gosh that's a bit of an overplay, but it was in a completely different context in each case. and I thought well actually ok you know it is really important but maybe it might be better spread out.

It is a challenge isn't it to truly integrate things without it being artificial.

Yes, we work really hard at it, and what we do in the first year is we teach, they do local anaesthetics, they will do it physiology, they will do it in chemistry and

they will do it in one of the biochemistry. So they will do the same area in three different domains. And of course that's the beauty of being a new department, because rather than we have always done this, actually there was none of that it was this is how we are going to do it across, and it is good. How do you do it?

We do have an integrated curriculum but obviously you have got certain baggage from history.

Yes, this is the way you have always done it. We have inherited a bit of that, we have got a couple of life sciences courses that were taught before.

How would you describe the culture here in general?

Urm I think it's young and, yes it's a young department and I would say we are a happy department, urm which I think rubs off on the students. People, the staff do get on and that's partly because we have all gone through this experience of it being a new school, this is our product, you know, and we all feel a sense of You look at the curriculum and you think I wrote that module I don't want, you know, someone messing around with that because actually that's mine. That sense of ownership is quite nice. We are a very integrated team urm, you know you will get petty niggles but there is nothing. Yes I would say there is a culture of, and there is a willingness to change here. You know, the new school, this is year X, you know, we are early err but people are still very reflective about what they are doing. Because I think it would be easy here to say well you know ?? after 10 years but people are very open. Which I think again is part of being a new school there isn't such a degree of complacency. Nobody is feeling phased, if the curriculum changes there is nobody here thinking oh my goodness how will we manage, it's like ok.

And how easy is it to introduce new ideas?

Very, there is a willingness to listen and we do make changes, it's not just talked about, it actually happens. I have worked in places, ?? talking shops and you spend hours and hours and hours talking about something and then you go right we will review it again next year. That doesn't happen here, you review it and then someone will go away and do it. It must be the same where you are?

Oh yes we try to it's a challenging time with the new standards. Do you think the regulatory body are on the right lines with Millers Triangle?

Myxx..... Millers triangle was just, as you know, it was discredited within years, you know ?? on and on and on. I don't know why they have just suddenly launched on Millers triangle now. It does what it says it does, so why talk about does in terms of undergraduate education. You are not doing it until you are doing it, nobody is. Do you remember that first day of being qualified, flipping heck, there are all sorts of things coming down and you think what now. But that's does, I was in the same dispensary a week before that wasn't does.

It's a good ?? but I do hope it's not a, I hope we are not going to lose things that aren't obviously ?? I hope that won't mean that things get lost under that mantel, you know. That you come out with these broad terms and you end up saying well I don't see why they need to know about ? whatever.

This is a concern for some people isn't it, that it becomes a training course

That is the real danger, rather than an education for life,

Does that concern you?

It does, a lot actually. And how much freedom we will have to continue doing the things that we believe to be right really. And also if the students start reading it maybe reinforces what they think, their expectations. All this stuff I can't see where it fits in. But I do also remember that third year where you feel everything is being gathered together, it's a four year course now..

What do you feel about that move from a 3 year to a 4 year course?

It had to be because of A levels being watered down didn't it.

That was one of the drivers.

They don't know as much as we knew coming in, they got better grades than we did of course.

My son is doing A levels at the moment.

It's gorgeous isn't it, we did it for the last time last year, it's absolutely gorgeous and then you have to wait for the results, fabulous. Is he doing pharmacy?

No he doesn't know what he wants to do, he is doing science A levels. It's so different to what I did.

Yes they have done their AS levels and they are half way there. My kids both did maths A level and it was hard but it was completely different to what I did. I am not saying it is better or worse, I have got no idea whatsoever. But we certainly know that coming in they know a lot less chemistry, they find the chemistry a lot more difficult. We shouldn't be able to look at the first year chemistry and be able to do it after all this time.

Talking about OSCE's what do you think the value of OSCEs are?

XX..... I think on paper they are tremendously useful, I think they have so many flaws, this is my experience, I am really really interested in OSCEs. I think all my research at the moment is on OSCEs and whether you can see anything ?? For example at the moment I am researching on whether if we look at how people perform on OSCE can we predict who is going to go onto the register,

who is going to pass the registration exam. Not from the evidence of this school. And that's really interesting because if you look at what the society, what GPhC are saying about shows how you would expect there to be quite a good correlation between people who perform very well at OSCE and people who perform very well at the GPhC exam, if both are doing as they were intended. They have got different competencies and learning outcomes but if both were fit for purpose, and I don't know which one isn't, I really don't, then you would expect there to be a high correlation between that. And also to be a high correlation between people who demonstrate strong ability on paper and people who perform, we are always astonished in OSCEs by people who do very well who just talk the talk.

They can get through the ..

Yes

Can think on their feet.

Yes

We are about to move to a more OSCE based programme for third year practicals for dispensing practicals..

That's an interesting idea.

So they don't always correlate with competence?

Competence yes. We are not committed, ...xx....., um and nobody has got tremendous confidence in their OSCE in terms of nobody is saying that's all I am going to do for one of my modules, like the medical schools do. So we are doing them but what are the consequences of failing a level four OSCEs. So one school of pharmacy have a station where if you don't pass it you have to repeat the OSCEs. There must be something on that station that links to the patient - remember they are a sandwich course so they are nearer to practice than us.

That's at X?

Yes. But nobody said to me during this project, if they fail their OSCEs at level four then we don't let them through the degree. As undergraduate schools we are not demonstrating our confidence. We release people who have never passed an OSCE, not our criteria, they passed everything else. But nobody is making OSCEs absolutely critical, no one at all, to progressing to the next year or passing the degree.

Whereas a medical programme you would fail wouldn't you?

Yes a place like X it's all they do, OSCEs. They get to a station and I think it has a very superficial, you know, and then there is all this personality aspects. You know you have got the really confident people who come in, they don't know a great deal but they just bludgeon their way through.

They are used to doing that in life in general?...

Absolutely. And you have got other people who really know a great deal but in that context, which is so different, simulated, it's really simulated.

So what other ways do you think we should use ...

I really don't know, I am uncomfortable with you know you finish your Pre Reg and you are qualified, I would have after qualification from year one I think that's how I would assess at a point where the expectation is you are competent. That doesn't mean being checked like a pre reg just going, like a new driver wearing key plates, your drive like everybody else but there is an acknowledgment of the difference between someone who is newly onto the register and somebody who is, you know, got a bit more about them. It's a hard question. I am really uncertain about OSCEs because on paper I am a really big supporter of them, I think if they were to work properly they could be extremely useful. But I think we have to be much more certain of the validity and the reliability. Because we are not having them as a significant part of anybody's assessment, the degree, nobody is doing that work, looking at the validity and reliability. So we have got one foot in the water but we are not really going for a swim, not really.

And yet quite a lot of people think the whole aim of the MPharm is to produce a competent pharmacist at the end of the day.

Oh yes we are back to that.

Yes sorry.

No I think it's a perfectly good place to start really and finish, but I really am not sure.

There needs to be more discussion is what you are saying?

Yes and I think this expectation of August 4th and suddenly you are competent, that's fantastic isn't it really, you know.

You get very much individuals in a school of pharmacy.

Very strong personalities, really really strong personalities in academia.

Yes you get a combination of academic and pharmacists as well. How do you view that?

You have got to, I suppose because I am quite old relatively to most people in the School of Pharmacy, and because I have done xx for such a long time, and probably quite accepting of this combination of personalities because nobody goes into academia if they are shy and retiring do they. But that's the nature, I think it's not just schools of pharmacy,

This move to include more social and behavioural sciences within the curriculum. On the questionnaire I got quite a range of responses about this. Do you think we have gone as far as we should in that area?

I do because it's so abstract. I teach on the final term, the psychology and sociology of a pharmacist and you teach all these things, and they say it's all so obvious and it is because it's the experiences of your life and what makes people take medicine, not take medicines, what type of people could you predict. And all these things that we were never taught were we. And you do wonder whether we are teaching something as an exercise which is really an experience, you know, teaching....

Which you think they could probably pick up anyway.

I think they have to pick it up, I think they do.

??

Yes I think so. you know I don't think you can, you know, is there is a response to an angry person or would everybody, you know ...

When you have dealt with a few you have more of an idea don't you.

You are probably quite like me, not particularly noisy in terms of schools of pharmacy, in fact all the people you are meeting are all quite quiet, there are much noisier people in this department. And my way of dealing with an angry person would be very different to one of the young men who are a bit, you know. How can we teach two people how they respond to something. Yes I mean there is all, that's the problem with the GPhC being so prescriptive, they have got all their standards and you have to gemmy them in to the curriculum in some way. And that's quite challenging to make it meaningful, not just a tick box exercise. Because you want them to experience it not oh yes we talked about that in lecture 13 in whatever.

That's right just by ticking it off ...

Yes we have done it, OSCEs are quite good on that sort of thing.

Yes if you have got good role players I guess!

Yes, maybe that's what we are doing wrong, we are being a bit greedy when we try. Because they are so expensive and onerous to run. And it's such a pain

and so expensive in every sense you just think I really want maximum value out of the OSCEs, and then we get greedy.

They are really well thought of aren't they as a ...

Students hate them.

Because they see them as a pass fail thing?

I don't think we are, you know, committing, most schools of pharmacy use lecturers as standardised patients. Well you know, you come round the corner and you see someone who told you off the week before, that's not a standardised patient, it's oh my god.

Its not a fresh start.

It really isn't, I know you, oh. Or they come round the corner and it's the head of the school sitting in a chair ready to talk about mythical bunions, you know, that's not ... So we are not committing, we are saying we want to do them, we need to do them, we are not using standardised patients, urm, we are not committing to using them as a sole form of assessment in anything are we. We have got a few modules where, we do a lot of OSCEs here, and we have got one module where it is a significant part of the module, a very significant part, which actually is X's module.

What sort of type of thinking and approach do you think would be suitable for the ideal pharmacist? How do you think they should be thinking and their approach be?

Well I would say that every other line should be safety, ethics, humility -the patient comes at the top of the tree. You have someone who is never ever taking that out of their head. So that would be the main thing, so somebody who is most concerned about their patient. Somebody who is only prepared to act ethically under whatever circumstances, and somebody who is open to understanding how little they know, humility really. So safety, ethics, humility. If they leave us with nothing else than that, those three things, it can't go horribly wrong, I don't think it can, even if they only take number one away. I do think this ethical, you know, the world is extremely different to the world that was there in the 1980s isn't it, we are not such a philanthropic society as the one we graduated and qualified into. And just this way of dealing with people, they can be very cocky, they can be very urm. This university, pharmacy on this campus it's the highest entry degree, and urm what I keep being told is the pharmacy students think they are the kings and queens of the student union. That to me is not .. and it's not because I think we are inferior to anybody else, I don't think anybody should be looking at other people ?? So this humility is what drives you to carry on learning and we know that when people leave here they are only just beginning, we have educated them, we have trained them but it's just the beginning. And for them to leave with that knowledge in order to keep the

patient safe I have got to keep going, I have got to keep going oh it's for everybody to keep going. My dread is opening up the PJ and seeing one of our students there, and maybe thinking we have let somebody out who doesn't understand what it means to be a pharmacist. Is that the sort of answer you were looking for?

Yes, there are no right answers.

It is definitely patients right at the top, your career isn't at the top. You know at the beginning of the fourth year I say to them you know you have got two choices, either you kill a patient or you get struck off, yep those are your two choices. A good pharmacist is happy to be struck off than to kill a patient. I would rather be struck off than kill a cat really, you know. It's that sense of they are at the top and everything about you is whatever and you know nothing, really know nothing, we none of us know anything because there is just more and more that we don't know.

How easy is it to try and inculcate these values as you go through the programme?

I think it's important that the people that they respect keep reminding them.

Does the whole programme team work together in that?

Yes absolutely, in all fairness the science members of the team are very good. Because you could argue that they are all assigned a personal tutor, if somebody has a personal tutor who is not a pharmacist are they disadvantaged when they turn to fitness to practice and code of conduct, absolutely not, absolutely not. The people who work here have got great integrity, and of course they are no different to any of us. It wasn't magic that makes you, you know, everybody should be open and honest and put patients first its not rocket science is it. But to my mind that's number one, patients at the top.

INTERVIEW FINISHES